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L. N. WIGGINS.  
President Illinois State Dairymen's  
Association.

W. N. WIGGINS

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THIRTY-SECOND

# Annual Report

OF THE

## Illinois Dairymen's Association



Convention held at Effingham, Illinois,  
January 16, 17, 18,  
1906


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Compiled by GEORGE CAVEN, SECRETARY  
Stenographic Report by EMMA N. HIGINBOTHAM

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## Letter of Transmittal.

Office of Secretary,  
Illinois State Dairymen's Association,  
Chicago, Ill., 1906.

To His Excellency, Charles E. Deneen, Governor of the State of  
Illinois:

I have the honor to submit the official report of the Illinois  
State Dairymen's Association, containin gthe addresses, papers,  
and discussions at its ihtrty-second annual meeting, held at  
Effingham, Illinois, January 16th, 17th and 18th, 1906.

Respectfully,

GEO. CAVEN, Secretary.

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## List of Officers.

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President—

L. N. WIGGINS, Springfield.

Vice President—

J. P. Mason, Elgin.

Directors—

J. P. MASON, Elgin.

M. S. CAMPBELL, Genoa.

L. A. SPIES, St. Jacob.

H. J. YOUNGS, Stillman Valley.

W. R. KIMZEY, Tamaroa.

L. N. WIGGINS, Springfield.

E. L. WILSON, Manhattan.

Secretary—

GEO. CAVEN, Chicago.

Treasurer—

JOHN COOLIDGE, Galesburg.

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# By - Laws

of the

## Illinois Dairymen's Association

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### Officers.

Section 1.—The officers of this Association shall consist of a President, Vice President, Secretary, Treasurer, and Board of Directors, composed of seven members, of whom the President and Vice President of the Association shall be members and the President ex-officio Chairman.

### Duties of the President.

Sec. 2.—The President shall preside at the meetings of the Association and of the Board of Directors. It shall be his duty, together with the Secretary of the Board of Directors to arrange a program and order of business for each regular annual meeting of the Association and of the Board of Directors, and upon the written request of five members of the Association it shall be his duty to call special meetings. It shall be his further duty to call on the State Auditor of Public Accounts for his warrant on the State Treasurer, for the annual sum appropriated by the Legislature for the use of this Association, present the warrant to the Treasurer for payment, and on receiving the money receipt for the same, which he shall pay over to the Treasurer of the Association, taking his receipt therefor.

### Duties of the Vice President.

Sec. 3.—In the absence of the President his duties shall devolve upon the Vice President.



**Duties of the Secretary.**

Sec. 4.—The Secretary shall record the proceedings of the Association and of the Board of Directors. He shall keep a list of the members, collect all the moneys due the Association (other than the legislative appropriations), and shall record the amount with the name and postoffice address of the person so paying, in a book to be kept for that purpose. He shall pay over all such moneys to the Treasurer, taking his receipt therefor. It shall also be his duty to assist in making the program for the annual meeting and at the close of the said meeting compile and prepare for publication all papers, essays, discussions, and other matter worthy of publication, at the earliest day possible, and shall perform such other duties pertaining to his office as shall be necessary.

**Duties of the Treasurer.**

Sec. 5.—The Treasurer shall, before entering on the duties of his office, give a good and sufficient bond to the Directors of the Association, with one or more sureties, to be approved by the Board of Directors, which bond shall be conditioned for a faithful performance of the duties of his office. He shall account to the Association for all moneys received by him by virtue of said office and pay over the same as he shall be directed by the Board of Directors. No moneys shall be paid out by the Treasurer except upon an order from the Board, signed by the President and countersigned by the Secretary. The books of account of the Treasurer shall at all times be open to the inspection of the members of the Board of Directors, and he shall, at the expiration of his term of office make a report to the Association of the conditions of its finances, and deliver to his successor the books of account together with all moneys and other property of the Association in his possession or custody.

**Duties of the Board of Directors.**

Sec. 6.—The Board of Directors shall have the general management and control of the property and affairs of the Association, subject to the By-Laws.

Four members of the Board shall constitute a quorum to do business.

The Board of Directors may adopt such rules and regulations as they shall deem advisable for their government, and may appoint such committees as they shall consider desirable.

They shall also make a biennial report to the Governor of the State of the expenditures of the money appropriated to the Association, and arrange the program and order of business for the same.

#### **Election of Officers.**

Sec. 7.—The President, Vice President and Board of Directors shall be elected annually by ballot at the first annual meeting of the Association.

The Treasurer and Secretary shall be elected by the Board of Directors.

The officers of the Association shall retain their offices until their successors are chosen and qualify.

A plurality vote shall elect.

Vacancies occurring shall be filled by the Board of Directors until the following annual election.

#### **Membership.**

Sec. 8.—Any person may become a member of this Association by paying the Treasurer such membership fee as shall from time to time be prescribed by the Board of Directors.

#### **Quorum.**

Sec. 9.—Seven members of the Association shall constitute a quorum for the transaction of business, but a less number may adjourn.

#### **Annual Assessment.**

Sec. 10.—One month prior to the annual meeting in each year the Board of Directors shall fix the amount, if any, which may be necessary to be paid by each member of the Association as an annual due.

Notice of such action must be sent to each member within

ten days thereafter, and no member in default in payment thereof shall be entitled to the privileges of the Association.

**Amendment of By-Laws.**

Sec. 11—These By-Laws may be amended at any annual meeting by a vote of not less than two-thirds of the members present. Notice of the proposed amendment must be given in writing, and at a public meeting of the Association, at least one day before any action can be taken thereon.



Proceedings of the 32nd Annual Report of the Illinois Dairymen's  
Association; Held at Effingham, Ill., Jan. 16, 17, 18, 1906.

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The Illinois Dairymen's Association met in annual session in the opera house at Effingham, January 16th, 1906, at 1:30 p. m.

President Joseph Newman in the chair.

The President:—

Ladies and Gentlemen:—It is my pleasure to again open the Illinois Dairymen's Association, and call to order its 32nd annual meeting. As usual, being christian citizens, we will open this association with an invocation, and Father Lammert will invoke a blessing.

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INVOCATION.

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Rev. Fr. Lammert, Effingham, Ills.

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Mr. President, Officers, Members of the Illinois Dairymen's Association, and Ladies and Friends:—

I have been invited to open your thirty-second session of the Illinois Dairymen's Association to invoke God's blessing upon this session, and it is with the greatest of pleasure, I can assure you, I have accepted the invitation. I have always been for the welfare and for the best interests of our farming community and the community at large as well. Nothing will give me more pleasure than to see God's blessing with you. It will surely

bring abundant fruit upon our community and that is all we can wish for. Now you all know we may work and still not have the success we desire; we may farm and toil and if God does not send sunshine and rain it is all in vain. We may build, but if we build without God then is it all in vain. It is of the greatest importance to have God's blessing and so that this your thirty-second session of the Illinois Dairymen's Association may bring much fruit, abundant fruit, I ask you to rise and say with me:

In the name of the Father, and the Son and the Holy Ghost: Our Father who art in heaven, hallowed be Thy name. Thy kingdom come. Thy will be done on earth, as it is in heaven. Give us this day our daily bread, and forgive us our trespasses, and as forgive those who trespass against us. Lead us not into temptation but deliver us from evil, for Thine is the kingdom, the power and the glory, for ever and ever. Amen.

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The President:—We will not listen to an address of welcome by Mr. Bissell.

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#### ADDRESS OF WELCOME.

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Mayor Bissell, Effingham, Ill.

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Ladies and Gentlemen:—

I will take up your time just for a few minutes. I wish to extend to you a hearty welcome from us all, and I assure you it is a hearty welcome.

I understand they are milking cows by machinery now. I am told there will be one here operated by a gasoline engine at this association, and I am anxious to see it.

You have quite a full program so I will not take up your time, but just wish to extend to you our heartiest welcome. I thank you.



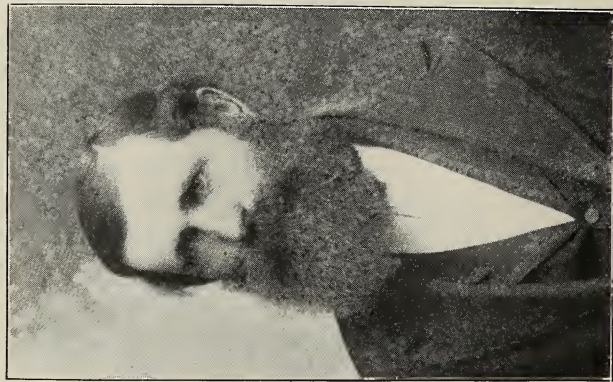




Anton F. Jensen, Pres.



F. G. Austin, Sec.



H. W. Dust, Treas.

Officers of Effingham County Dairymen's Association.



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**RESPONSE.**

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Mr. W. R. Kimsey, Tamaroa, Ill.

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Mr. Chairman:—

When the State Dairymen's Association decided to come to Effingham, the people from the northern part of the State thought they were coming down into Egypt. I don't know whether it is Egypt or not. I am still 120 miles further south, and I am not at the southern end of the state. The people from the north think all we have down here is hardpan and politicians. I can't speak so much for Effingham county. In Perry county we have no politicians. We don't know what the word means there. In your own county I suppose at certain times of the year my friend Dick Lawson is seen doing a little hustling, and friend Martin or some of the others were giving the glad hand and shake, and he'd take the baby from the mother and ask her in the store and kiss the baby—not the mother. This is not politics, it is merely informing the people along some lines that might be necessary later on. If you hear the liveryman, certain nights along in the fall, had three or four teams out driving the biggest part of the night, and should ask him if he had had any one out the night before, he would say "No, all in the stable." His memory is short, but that is not politics. I can assure the people from the north end of the state as they come down here we Egyptians know nothing of politics.

Southern Illinois was, as its name indicates, the Egypt of the plains, the place where the unsettled and poorer northerners came. It is noted not alone for its statesmen, its governors and generals and other noted people, but it is the home of the farmer. We have too long followed in agricultural lines the example set by our eastern agricultural friends, but without the necessary changes. The dairy work is coming to the front and we are making these changes, and while probably some way-back farmers

who have failed to see what is building up the soil and making property more valuable, have not taken up dairy lines, others have done so and have encouraged the dairy work, not alone for the fertility of the soil, but to put money in their pockets.

When I was selected as a member of the committee on the Board of Directors some one said I was the Jersey crank down in Egypt. That may be. You will find the Jersey man and dairymen as a whole are like the congressman and new member in the House who when he rose to make his first speech, with a good deal of temerity said: "Mr. Speaker." The speaker recognized him and asked what he wanted. "Am I entitled in this talk that I am going to make and have circulated among my friends, to say I have a nice bunch of Jersey heifers to sell?" We dairy fellows are pushing the work and taking the good results in season and out of season. It may not be any special benefit to us, but we do think it will be a help to the communities which take up the work.

You find people asking which breed of cows is the best, and some say Jerseys, some say Holsteins and so on. It puts me in mind of the two little boys who saw a rattlesnake while they were playing. They came up and looked at it as it lay coiled for a strike, and one boy was fascinated with the head and glitter and the other was absorbed in the rattles. The father came to the rescue and talked to the boys and asked what they saw about the snake that especially fascinated them. One said its head. "What a head it has." The other boy hadn't seen the head, but only saw the rattles and tail. So it is with a good many of the dairy fellows. Some see milk and push nothing but milk, and I don't know you Effingham people, but down here it is everything milk and no butter.

In other sections where there is not the demand for the milk, but a demand for butter, they see only that end of the dairy line.

In speaking for the visitors who are here, I greatly appreciate the cordial welcome by the Mayor. I also am waiting with interest to see this wonderful machine he speaks of and to see your

town as a whole. I thank you, Mr. Mayor, for the cordial invitation, and the dairymen here I am sure will do nothing you will be ashamed of, if they do, speak to the police magistrate.

By the President:—The dairymen don't know what you mean by the police magistrate. They never travel in that line. The keys can be left right here and you can see us walking the good moral path that all good dairymen walk in.

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#### PRESIDENT'S ADDRESS.

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I suppose the Dairymen's Association meeting without a president's address would be like Hamlet without the ghost.

Ladies and Gentlemen:—

Again the rapid flight of time has brought around another year, and it gives me much pleasure to meet with you in this city of Effingham, in a part of the State before unvisited by the association, and the officers feel sure of a successful meeting and of gaining an added amount of interest from any who are having their first opportunity of attending the meetings. I met some of you two years ago at Greenville and learned of your success in having a condensing factory located here, and this meeting should aid you in your efforts to furnish them a wholesome, pure article of milk at a moderate price; this will make the factory a success and you a home market for your milk. The general markets the past year were good considering the heavy production owing to the favorable weather for making milk. The refrigerators were filled with butter as never before, but, with England opening her doors it is fair to predict that all will go out at a profit before March 15th. The fresh make at the present time is very light indeed. Undoubtedly, next summer with ordinary weather conditions it will be hard to keep fine creamery butter up during the storing season to 20 cents, which will necessitate

more economical production to give us the same profit on the farm. You have the farms and the crops, have you the

#### Dairy Cattle.

This feature of dairying I am pleased to say is receiving more attention, and well it is so, for without good cattle what can you expect from well tilled land? If the product is sold through a poor cow, where is the profit? We must continue hammering away, in season and out of season, using the texts, "Weed out the poor cows," "Test your cows," "Poor cows are only a bill of expense," "Feed a good cow a balanced ration," etc., etc. I know in the Elgin district a better grade of dairy animals is being sought after. All signs point to an awakening of the dairy farmer to higher ideals. It was with much pleasure I read in Hoard's Dairyman a few days ago of a Wisconsin herd that had been tested for a year past that averaged 12,724 pounds of milk each; average test 3.60 to 3.70 butterfat, six of them 2 year olds which averaged 11,663 pounds each. Those 3 years old and over averaged 13,221 pounds of milk for the year. Dairymen! What are your cows doing for you? Figure out for yourselves the difference in your profits—if your time and feed were put on such cows, than on your 5,000 pounds per annum cow, that the most of you are milking. While on this subject I want to call your attention to the opportunity you will have next month in Chicago at the annual meeting of the Buttermakers' Association and the big dairy show to be held at the Coliseum. They will have on exhibition 150 of the finest dairy cows to be found in the country, from representative herds of the different breeds. A day or two spent with these animals will make you a better judge of a dairy animal, and from the general show you will see the possibilities of dairying and go home better prepared to do your part. This is the beginning of great dairy shows and I bespeak for it a remarkable reception and that it will become an annual event; it should be held in connection with this association and receive its support. It is practical education; our resolutions should recognize this.

**Our Agricultural School.**

We all love and admire our State University. Naturally, the Agricultural College part of it is what we are most interested in and appreciate. I know that it merits this appreciation. In what other agricultural college will you find men with the ability of a Davenport, a Hopkins, a Mumford, a Forbes? Such institutions are judged by their "works," and our estimation of them is reached by seeing, by reading their bulletins and by personal knowledge. Our especial interest there, of course, is the Dairy Department, the mother section of agriculture. As your President, I carried out your instructions in regard to leaving off the Dairy Committee from the Dairy clause in the Experiment station appropriation bill and the usual bill was passed in that manner, giving the Dairy Department \$15,000 each year to be used as the college saw fit. They have had this amount now, annually, for three years, and \$10,000.00 of it was asked for to be secured from the legislature for field work, such as was started by Mr. A. J. Glover. That is carrying dairy knowledge to the farmer and manufacturers of dairy product of today. The college itself can do largely the work for tomorrow, the future, in educating the young men from each section, but, how to reach and improve the farmer of today was the question, and this field work was the one settled on. They found money enough to have Mr. Glover in the field on the old appropriation and the extra \$10,000 was to engage others for the several sections of the State. It was not until this fall that sufficient men were found to cover the territory and that only very thinly. One man in Chicago Milk Supply, one in Northern Illinois, one in Central Illinois, one in the Southern part, with two extra men at the college. We feel sure if this force is kept in the field and does its duty, the taxpayer will never regret the outlay. The results of the pioneer work done by Mr. Glover a few years ago in connection with that done at the college, is coming to be seen and appreciated, and it gives us courage to advise enlarging this line of work as much as possible. As the several departments



under Prof. Fraser at the college are on our program you will hear from them direct and they will show the growth of the Dairy Husbandry section. I bespeak for them your approval and earnest co-operation in securing further appropriations.

#### **State Fair.**

The State Board of Agriculture continues improving the grounds at Springfield; one of the new dairy barns was ready this year and under Supt. Auten's management they had the best dairy cattle show ever held in Illinois. All glory to him! I would recommend that you continue the giving of premiums in that department. The dairy products department we cannot speak so highly of. The board has built a fine building, but the superintendent in charge not being interested in dairying, does not secure the exhibition that could be most profitable to the people. He should insist on a large refrigerator capable of handling three times the entries that are now received and return the small one to the dome building for the use of the fruit men. This change made and keeping out of the grounds all fakirs in dairy machinery, this department would stand on higher grounds.

#### **The Farmers' Institute.**

It has been very profitable to me to meet with the directors of the State Farmers' Institute, as the President of this association is by law a director *ex-officio*; anything that will tend towards educating or uplifting the farmer is fostered by the institute. I have found them ever ready to aid the dairymen in any way they can, and at their annual meeting dairying is given a prominent place on the program. At local institutes the subject is on nearly every program. This association cannot do better than work very closely with them and thus be mutually helpful.

#### **The Milk Producers' Association.**

This is a new association formed in Chicago and is composed of the milk shippers largely. The legislature passed a bill appropriating \$500.00 a year to pay the expenses of holding two

institutes each year on educational lines. Their next meeting is to be held January 22nd in Chicago, to which I have received an invitation. We cordially welcome this new force in dairy education and should aid it in every way possible, and I would suggest that you instruct your officials to offer to print their proceedings in our annual report. I would also suggest that a committee be appointed to inquire into the advisability of forming an Illinois Buttermakers' Association as another arm to this central organization.

#### Pure Unadulterated Food.

We are very much interested in this subject, especially in that part referring to dairy products and imitations thereof; not so much in their manufacture as in their sale and for pure dairy products. The prices received for milk the past two years, which has been so satisfactory to the Dairymen, can be traced to the passage of the oleo bill by the national law makers, but, my friends, you must not rest on this, but push on, assisting all efforts for pure food, being very particular to see the different articles must be labeled plainly just what they are and what they contain. The purchaser has a perfect right to know this. When we go to a store and buy a pound of butter we have a right to know whether the article is pure butter made wholly from cow's cream, or a concoction of different fats, colored to resemble butter. I am pleased to see from different reports the revenue collectors are on the alert and many have been the convictions of persons engaged in this nefarious traffic, both wholesale and retail. Generally, the retailer is the one caught. It is quite different dealing with this question in the United States court to that in the justice courts and I would warn retailers here and everywhere that they do not get off with a \$10.00 or \$25.00 fine, but it is \$200.00 to \$500.00, and imprisonment also. The convictions in Chicago and Pennsylvania lately have done much to curtail the make of "colored oleo," and steady the market for your products, hence, stand by the National Dairy Union, who are our sentinels watching the enemy's moves, and whenever they



call on you for support in any way, act promptly and show them Illinois dairymen can be relied on. The Pure Stock Food Bill, which your committee sent to the legislature, was passed and is now a law to be enforced by the pure food commission. We received assistance from this department and much help from the State Farmers' Institute. The Pure Food Bill did not meet with approval and did not pass, although much time and work was put on it. A general pure food law is now before congress and should it pass many of the abuses aimed at in our state law will be effectively remedied. We shall hope to hear from Hon. A. H. Jones, the commissioner who is on the program, to tell us more directly about these matters, and we hope he will be able to tell us who the new assistant will be, as according to the law he must be a dairyman. We have waited patiently on this change being made and hope he will relieve the suspense.

#### **Our Program.**

Your directors tried to cover the important features in dairying, and while we were unable to secure the services of some of the leaders, we have a very full program and by giving the speakers close attention and by bringing out the discussion after each paper, you can make this a very helpful and useful meeting. We have met annually all these thirty-two years to deliver addresses, read papers, discuss topics, examine dairy products and machinery and become better acquainted. Nowhere are offered better opportunities to exchange experiences and ideas, or, to learn much that is new and helpful. We aim to give you talks from the best talent in the State and Nation. That these meetings have been productive of good, there is no doubt—the added interest every year proves it. In talking with many who “never speak in meeting,” I find they are full of valuable information, having experimented with ideas advanced by others, and it can only be brought out by discussion. In ending my fifth year of service as President, I wish to thank my friends for the honor conferred upon me. While I have not been able to give the time to it that a President should, I have done what I could

cheerfully and with no regrets. Everyone who has worked with me during these five years has been very considerate and helpful and whoever is elected in my place I can assure the hearty co-operation of all interested, which always brings success.

#### Change of Name.

Our association is incorporated as the Illinois Dairymen's Association. On taking up the duties of President I found it was known as the Illinois State Dairymen's Association, and its printed matter was printed that way. The secretary and myself have gone over the records and books and cannot find that any change was ever made. I have personally examined the records at Springfield and no change was ever certified to there.

I would suggest a resolution be introduced changing the name to include the word State, and your directors be instructed to have the change made legally, and thus use the same form of name as other state agricultural associations do.

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#### APPOINTMENT OF COMMITTEES.

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There is a very important committee which I will not overlook at this time, but the other committees I will appoint some other time. That important committee I mentioned is the committee on membership.

This Association receives an appropriation of \$1,500.00, and from that has to print its report each year, which is quite expensive, and the mailing of them out to the members costs about 12 cents a copy, and we also use it for necessary business, but we never have used it for these annual meetings, they have to pay for themselves, and hence is not a charge to the State. This membership fee of \$1.00 entitles you to the report of last year and also this meeting's report when printed.

I will appoint on this committee:

Mr. J. W. Sliger, chairman, Effingham; Mr. J. E. Snyder, Rockford; Mr. L. A. Spies, St. Jacobs.

I hope this committee will get to work in season and out of season. You will find the badges right here, so that we can have a full membership at the city of Effingham. You will receive not only this year's report when printed, but we have the report of 1905 here, and each member can take one home with him. When this report is printed, a copy of the same will be mailed to you.

I would say to those who have joined and have paid their money, if they will step to the Secretary's table, they will receive their membership tickets as well as the badges, for the ticket is a receipt and shows you are a member.

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By the President:—I am sorry to be informed that the next gentleman on the program has a sad duty to perform and cannot be with us this afternoon, but will be here at one of the other sessions.

The next on the program is a paper by Mr. Biddulph, of Providence, but I will call on him later on, because we have with us this afternoon a gentleman from Washington who can only stay until the 4 o'clock train. This gentleman is from the United States Department of Agriculture at Washington, Mr. E. H. Webster, Chief of the Dairy Division in that Department. We feel honored to have him with us, and we want to give him all the time we can. We will now listen to Mr. Webster.

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**ADDRESS.**

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Mr. E. H. Webster, Chief Dairy Division, U. S. Department Agriculture.

---

Mr. President and Members of the Illinois Dairymen's Association, Ladies and Gentlemen:—

I want to assure you that I heartily appreciate the welcome

you have given to this outsider who comes here. I am sorry I cannot be with you all the sessions and hear the talks and discussions.

For a little while this afternoon I want to call your attention to some parts of dairying which will be touched upon again, but cannot be repeated too often.

One of the things that I find in traveling over this country and in talking with people either privately or publicly is that there are a great many men in dairying who think dairying is a little business; not a business that ought to command the respect of an intelligent man—that it is something small. They think milking a few cows is belittling. I want to call your attention to the fact that there isn't a single thing in agricultural history that equals dairying in respect to the income that it brings to the American farms. This "little business" yields an income, as will be seen from statistics, of something over seven hundred millions of dollars to the farmers. In producing this seven hundred millions of dairy produces there are more people reached and touched in various ways than in the production of any other one article on the farm. There are more men engaged in dairying, unless I might mention one other thing, which is the poultry industry, than in any other farm occupation, and more people interested in some form or another from the richest to the poorest; more benefit derived than in any other way.

If you feel that you are in a small business, just consider these figures and see what it means. Think of it. The farmers of this country that produce such a vast wealth of dairy productions, produce more than any other country in this line, because of the vast agricultural interests of the United States.

Another thing is, we must get credit that we consume most of this at home. I believe the home market is the best, but it is fortunate for us this year, we are finding place for some surplus goods in Europe. Surplus, think of it, and it all goes to help the income of the man who produced the dairy productions on these Illinois farms and other states of the Union.

Dairying is not a small business in any sense that you can look at it. I do not think there is another industry on the farm that calls in mind, in play, the thinking facilities as does dairying. You may think any one can milk a cow and haul it down to the condenser and sell it. Possibly it is true, but all do not make what they should out of the business. Why do they not? They have not quite learned that dairying is an educational science and requires the qualification of thorough study and preparation for financial results.

A man can, I believe, make something out of hogs in feeding them. You get an income from those hogs twice a year as the market may present itself to you. Other lines of industry may be followed and bring in an income, but there is nothing that brings in the steady monthly or weekly income, or, as it does sometimes, daily income, as the dairy cow.

The dairy cow herself is an animal, or a machine you might call her, that requires study. The dairyman has to know first what a good cow is, to know, second, how to take care of the cow, and third, how best to dispose of the products of his herd. It requires more study, more thorough study of the cow nature and principles of breeding to select a good dairy cow than any other livestock. It isn't a study that can be slurred over, but must be thought out all along these lines. You know the thinking men are the better men of the nation. In the dairying community we find there the most enlightened. More learning along agricultural science, the more interest in the affairs of the state and nation. We know dairy farm producers are better off financially. You may go south from here into the belt known as the cotton section of the United States and you can look over the conditions of affairs there where six hundred millions of raw cotton are taken from the land of the farmers south. What has it done? Impoverished the people and land instead of making them rich. They have been cropping year after year the same land in cotton until today their land does not produce what it did fifty to one hundred years ago. They can't produce



so much per acre. In the last few years they realized the situation and are studying. They are studying to increase the cotton crop on the southern farm, increase the amount per acre. How? By thinking. The fact is coming home to them that they must have something besides cotton—the old cow to raise the fertility of that soil and to restore it.

One of the interesting problems comes from those conditions in the south where the soil is impoverished from cotton cropping. They are turning to other things and wanting the dairy cow. They are going to have her, and the south will find themselves with dairy productions grown on southern soil. It will not take away from the north because we are growing very fast. The cities are outracing the farms proportionately. There is more demand for dairy productions every way.

We only have to go to the wheat sections of the west and they are another class. We can come to corn sections of central Illinois and they are constantly cropping of one crop and what is it doing to the land? Wherever that has been followed the farmers have impoverished themselves because they have depreciated the soil.

You go into the dairy section of Wisconsin, Minnesota, New York, Vermont, any state where dairying is one of the principal industries and you will find there, not low priced land, low wages nor impoverished land, but good barns, well kept farms and prosperous people.

A short time ago I spent a few days in Vermont, and there the conditions of the soil is difficult to farm, and those people are prosperous. They have grown rich on their dairies.

Go through Canada and the farms where dairy cows are the principal part of the farm and you will find they are well fixed. They had trouble on account of the enormous stones. I saw stone walls as large as this stage that had been piled up to make room to grow feed for the cow, and she paid for the labor on that farm and made the Canadian farmers a prosperous people, and such they are, a prosperous people the last ten or fifteen years, and it was

through the medium of dairying. They place so much stress on dairying in that country that the dominion and provinces have given considerable state and government aid in developing the dairy industry; not so much as here maybe, but they apply it in a wiser manner. They have educated the farmers there to a line of farming that is making them richer than the average farmer in Southern Illinois.

If any of you entertain the idea that it is a small business just think of these things and of the possibilities before you if you are intelligent men. Think of the chances for learning, the teachings now given in every state in the union through the dairy schools and colleges.

The main part of my remarks I want to confine to the dairy cow, and what she ought to be, and what she is on the average farm. Although we have produced so much wealth, the average yield for a cow in the United States is 125 pounds of butter a year, and 125 pounds of butter a year will not pay for the feed that is given to the cows in this country, if we value that feed at the selling price on the market. The farmer has been able to grow the feed and feed it at that great loss, and make a bit of a profit if I may put it that way.

We find, in looking over dairy records, and this herd that your President mentioned is one of the best in this country, that the possibilities are almost beyond conception what a dairy cow can do. Individual animals in the past twelve months producing almost 1,000 pounds of butter in that twelve months, instead of 125 pounds. You have that wide margin before you. Isn't that worth considering? How did that man get it? Think about it. One thousand pounds; that is abnormal, as few attain it. A good cow and well kept. I will venture to say that on every farm in Illinois, yes, on every farm in this country, you will find some cows that do not come up to the 125 pounds of butter per year. I won't say every herd in this country. There are a few who have brought it up to 300 pounds and 500 pounds, but the rank and file only 125 pounds, and there are some below 100



pounds. There you have it, some down below 100 pounds and then this up to 500 pounds, and you see these 300 and 400 ones have to lift that low average up to 125 pounds, and there are a whole lot of fellows below 125 pounds per year.

If a man's going to start a boarding house, one of the things would be to get boarders that first pay their bills, and then he would try to feed them to continue to pay their bills. When a dairyman starts, he doesn't care a snap whether they pay or not. He will get some kind and feed them; they can't talk back to him in the English language, but are talking more effectively in dollars and cents. Find out what it is and what might have been.

There is a little country across the water, and yet a big country in some ways, that has done some wonderful things in dairy development. Ten years ago Denmark was not important as a dairy producing section cut no figure; and yet today when we talk of shipping goods abroad we have to compete with Denmark. Only ten years ago Denmark didn't figure at all, and today every one guages things by Denmark's products and the Denmark quality and price. They woke up to the fact that it didn't pay to keep boarders that didn't pay; they woke up to the fact that they were not making a product that would go into the world and sell.

One of the things they did was to organize the farmers of that little peninsula into associations, mutual associations. They helped each other where the individual could not help himself. The Denmark Test Associations are organizations of dairymen of fifteen, twenty-five, thirty in number, and they are four hundred of them on the peninsula. They got a man to go who was capable of showing the weak spots, able to point out that this cow was eating up the profits of this cow, and applied the scales and Babcock test. When they did that, they found some remarkable things. Over half the cows were eating up the profits of the other half. They were wise people, and they went to work and eliminated the poor cows. They formed these associations and studied these questions. They began to get better sires for the

herd; sent the poor cows to the butcher and gradually, in ten years time, they more than doubled the annual profit of dairying in Denmark. They raised that 125 pounds per year to over 200 pounds per year. I think if we could go into some of these herds here, we would find that they could be cut nearly half, and that then they could make more money than if we had the whole herd.

You have done some good work with Mr. Glover along this line of weeding out, field work, in the state. You ought to take the result of his work and consider it well. See if you have not something to do along that line. Mr. Glover's experiences, were extremely interesting in testing farm herds. The results he has obtained are still more interesting. In some of the best dairy sections of Illinois we are not what we should be by a long ways. I hope you will consider these questions.

If you think you are not making anything in dairying and that it is just a side issue, consider for a moment, and consider it from now on, that there is money for you in dairying if you will do the work right. Is your cow giving 2,000 or 3,000 pounds of milk per year. There are those that give 6,000, 8,000 and 10,000 pounds of milk per year, and wouldn't your profits be something at the prices today? I want to say to you that the cow will produce 6,000, 7,000, 8,000 and 10,000 pounds of milk, and she is going to eat but very little more than the cow that produces but 2,000 pounds. You can't afford to have anything else when you think about this question.

How are you going to get her? You can buy her. But the other fellow who has her is wise enough and he is not going to sell the best cow. You have got to grow her on your farm, and the only way is to first find out what you have. If you have a herd of twenty cows on your farm, don't let the next month's record go by without you're knowing what they produce. You will find some good ones and you will want to breed and have them right along. Others let the butcher take, and that soon. You will be surprised very often to find the old cow was not your good one as you thought, and the other way round. Apply the

record to them and know absolutely the daily record of the milk they give and the butter fat. You don't need to test every day, but every month, using a little judgment in that line, and you will know almost to a certainty how much they produce.

When you have found out how much every one in the herd is giving, you have taken the first step to successful dairying. Until you do that, unless you are a remarkable man, you won't get much success.

There are several things to think of, and these questions are up to every dairyman in the State of Illinois and every other state, just what you can do best on your farm. What kind of feeds to grow that are best adapted to the production of milk. Alfalfa, clover or which ever gives the greatest return per acre on your own farm. If you can produce all the feeds, or part of them, are questions that arise and you must think them out. You can do wonders on every farm by proper adjusting the crops to the feed of your herd without an addition of money in outlay. Here in Southern Illinois you can grow alfalfa I know and you can grow corn and you can have ensilage. With a silo you can produce more and abundant feed than in any other way, and it gives you a good succulent food, and succulent feed you must have.

When we come to study the dairy cow and all the questions connected with her, we ought to think along natural lines. In June, when we get the succulent grass, the cow gives the most milk, the conditions are right for it. We ought to perpetuate those conditions. During the cold winter weather they need that succulent food. We grumble because we don't get any return in the milk pail, and it is because we have not given the cow the encouragement in winter that she had in summer. We ought to supply those conditions that are obtainable so easily in summer so the cow can do her best throughout the entire year. Study that feature, and perpetuate June twelve months the year round. When you have done that you will feed silage the entire year.

You will put your cows in the barn in poor temperature and things of that kind.

I hope the dairymen of Illinois will take steps to lift up the hands of your State Dairy School and the amount of money being expended there to get these studies soived out on the individual farm. You should have some sort of test associations that would help you individually and collectively to bring up your herds, and would bring wealth to the state and your own pocket-books. You have the means of doing that. There is no state that is more liberal along this line and you ought to see to it individually and collectively that it is used for the best advantages, and you will get it if the authorities know you are watching them and asking them for help along those lines.

In connection with the work I represent, I would say if we can aid you in any way, we are willing to do it. We are carrying on experiments on various lines of dairying, doing what we can with the funds on hand, and in various cases helping out experiment stations and dairy schools. We are carrying on experiments in some places less adapted to dairy production, and we are getting some good results. We want the dairymen of Illinois to feel the department of Agriculture in its dairy branch is your work. It is more our work in Colorado, where they are beginners. We want to study your needs and come in contact with you and help you to solve these questions, and any suggestions we will gladly receive there. I thank you.

By the President:—Any questions any one would like to ask the gentleman, in reference to our work along this line.

Is Mr. Gilbert in the room? The herd I referred to in my paper is owned by this gentleman, Mr. Gilbert, and he is to speak for us, but I presume the train is not in yet, and we will have to leave that until later on, and take up another subject.

We will now listen to Mr. J. W. Biegler, of Sigel, who will tell us about his creamery.

ADDRESS.  

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J. T. Biegler, Sigel, Ill.  

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Mr. President, Ladies and Gentlemen:—

I assure you it gives me great pleasure to make a few remarks here this evening. I don't intend to detain you very long, but I will show you that with a little creamery, quite a good deal of money can be made for the farmer. I have my statistics here and will show you.

Now, I wish to say in the beginning, that any remark I may make that may seem to reflect, that you please overlook it, for that is not my intent. The intent is to show you what we did with our creamery, and, of course, in running a creamery, like anything else, if you want to run it successfully, you must work for it. That is what we had to do at Sigel. We had to compete with the condenser here, and we tried to prevent them from getting all we could from our creamery.

When we bought it, it was not in good condition. Our milk receipts were low. The condenser had come here, and their agent had a horse and buggy to go through the country every day, and with the inducement they offered, and a good many of the farmers being tired of the creamery and the test and the price for the milk, were willing to give it a trial, and at one time when I took charge, they were getting almost all of the milk. But we pitched in and did everything that we could. We tried an inducement for every hundred pounds that any hauler would bring outside of his own milk. That, of course, took quite a little bit of money from the stockholders, and it also helped to increase the receipts of our milk.

On January 1st, 1905, the total receipts of the milk for the month were 81,374 pounds of milk; the butter made by the test, 3,571, and by the churn, 4,173 pounds. The receipts for butter, \$1,209.85. Paid to the patrons, \$1,039.21. The earnings for



the receipts at 3 cents per pound, \$133.73. The expenses were \$384.11. The price paid the farmer 30 cents per pound. The amount of extra hauling, \$22.66, and the buttermilk, \$8.54, and the average test for all the milk was 4.3. The expenses were more than the earnings.

As I said before, the creamery was in a very bad condition at the time we bought, and we had almost to remodel it. We had to put in new machinery as the old was in such bad shape. It will not be necessary for me to read all these figures.

In January it was 81,374 pounds of milk, and in June it run up to 407,857 pounds. The butter by test was 16,814 pounds in June and by churn 18,232. The receipts for butter, \$3,362.22, and amount paid to patrons, \$2,898.31. Earnings of the creamery, \$582.05, and the expenses only \$303.61. The price paid was the lowest of the year, only 17 cents. The expenses, \$161.66, which was paid out of the stockholders' money in the treasury. Buttermilk, \$13.09. Average test, 4.

The grand total for the year for milk was 2,730,570 pounds. Butter by test, 112,099. The receipts for that butter were \$26,639.71. Money paid to patrons, \$23,475.14. The earnings were \$4,022.57 for the year, and the expenses were \$4,276.30. So you see our expenses were about \$200.00 more than our earnings. That looks like running behind, and we were in a way. But we paid out for milk hauling \$955.00. That is something no other creamery will do. If that had been left in the treasury, we would have had a good dividend.

We also spent \$1,000.00 to remodel that creamery. We won't have to do that now. Considering we expect to have \$1,000.00 in the treasury on the first of January, 1907, we will have a good dividend.

We paid five cents for every hundred pounds that we could get extra. Average price paid to the farmer 24.5c. for his butterfat. The receipts for buttermilk, \$131.98, and the average test 4.20.

So you see a creamery can be run successfully and some



money made out of it. A creamery is like anything else. I guess there never was a business yet, but what some of them were failures, and it is the same with creameries. The first creamery in this part of the country was a failure from the start. We have got one at Toledo and some others that are shut down.

Shut down, why? For want of milk. Farmers wouldn't milk. If you go and ask any of those farmers why they didn't, they will say because it didn't pay them. Why didn't it pay them? Because the product was not handled right at the creamery, or they didn't have the right kind of machinery there to get the best results. If you have got the right kind of a creamery and manager, you can almost run a creamery forty miles from nowhere.

You have got to get something out for the farmers. When a creamery is a failure, it is not always the fault of the farmers because they won't milk. It is sometimes the fault of the men at the head, or the machinery. I have never yet known a creamery that was a failure when handled right all the way through. When they see it pays, they will go in for it. Look at that Chicago land, \$125 to \$150; that's different. But here in Effingham you can get it for \$30 to \$50, probably. We can produce as much cow feed on an acre here as they can up there, and they can make more money than we can. Then why can't we, with out cheap land here, get as much from our product with not even the expense for the land, etc., and make as much money? I feel satisfied we can, and it will be the best thing to keep up the land, which is needed right here in Effingham. You keep cows and you get the fertility to go back on the land.

I did not expect to make a talk at all. I expect Mr. Jansen will tell you more about it. I thank you for your kind attention.

## FINANCIAL STATEMENT OF FOREST CREAMERY COMPANY, 1905

## SIGEL, ILLINOIS

| MONTH               | Lbs. Milk | Butter T. | Butter C. | Receipts   | Pd. Patrons | Earnings  | Expense   | Price | Extra Haul | B. Milk | Test |
|---------------------|-----------|-----------|-----------|------------|-------------|-----------|-----------|-------|------------|---------|------|
| January . . .       | 81374     | 3571      | 4173      | \$ 1209.85 | \$ 1039.21  | \$ 133.73 | \$ 384.11 | 30    | \$ 22.66   | \$ 8.54 | 4.3  |
| February . . .      | 69411     | 2993      | 3354      | 1070.12    | 1017.36     | 105.66    | 170.35    | 35    | 16.79      | 5.64    | 4.4  |
| March . . . . .     | 84984     | 3594      | 3619      | 1074.48    | 996.29      | 128.58    | 175.45    | 28    | 20.83      | 9.01    | 4.2  |
| April . . . . .     | 131737    | 5103      | 5237      | 1481.67    | 1281.36     | 225.22    | 332.44    | 26    | 44.07      | 8.41    | 3.9  |
| May . . . . .       | 345371    | 13560     | 14915     | 3021.81    | 2662.31     | 515.40    | 525.36    | 20    | 131.26     | 22.95   | 3.9  |
| June . . . . .      | 407857    | 16814     | 18232     | 3362.22    | 2898.31     | 582.05    | 303.61    | 17    | 161.66     | 13.09   | 4.0  |
| July . . . . .      | 388083    | 15375     | 17634     | 3346.84    | 2891.81     | 541.17    | 283.23    | 19    | 128.17     | 12.90   | 4.0  |
| August . . . . .    | 374580    | 15050     | 17085     | 3433.73    | 3034.88     | 525.64    | 355.22    | 20    | 132.84     | 13.09   | 4.0  |
| September . . . . . | 295586    | 12606     | 13908     | 2500.76    | 2448.66     | 434.11    | 333.68    | 20    | 95.02      | 13.60   | 4.3  |
| October . . . . .   | 213886    | 9037      | 10107     | 2304.23    | 1908.49     | 312.98    | 222.68    | 22    | 77.06      | 9.77    | 4.7  |
| November . . . . .  | 189730    | 8292      | 8905      | 1580.78    | 1671.98     | 286.97    | 465.72    | 21    | 68.53      | 8.60    | 4.6  |
| December . . . . .  | 147371    | 6100      | 6923      | 1653.22    | 1624.40     | 230.06    | 724.45    | 28    | 56.17      | 6.37    | 4.1  |
| Grand Total         | 2730570   | 112099    | 124092    | 26639.71   | 23475.14    | 4022.58   | 4276.30   | 24½   | 955.06     | 131.97  | 4.2  |

By the President:—You have got a very good object lesson here, and I would like to ask something about the overrun. You tell us those figures at the bottom are the totals, made 112,099 butter, 124,000 pounds of butter, and a big loss?

A:—A big loss. I don't understand.

Mr. Newman:—Did you manage this creamery?

A:—Yes sir.

Q:—112,000 shows 10 per cent overrun, when you give 124,000 you got 10 per cent?

A:—I don't think so. I think we ought to have more overrun. Our test was higher than it should have been. You can't get a great high test and pay a high price for butterfat.

Mr. Spies:—How about your test. Did you say—

A:—Ask the buttermaker.

Q:—What do you consider a fair overrun?

A:—About 15 to 16 per cent.

Q:—Think you can get that?

A:—I think so.

Q:—With the modern way of handling cream, run up to 20 per cent?

A:—I think so.

Q:—If that overrun had been gotten at that creamery, the patrons should have received more?

A:—Providing the other test was right.

Q:—Did you take a composite test every day?

A:—Ask the buttermaker.

Q:—Did you sell the butter?

A:—By auction once a month.

Mr. Spies:—Ever test the skim milk?

A:—Ask the buttermaker.

Mr. Newman:—What was the test of the buttermilk?

A:—Butter fat was just a very little—the skim milk about 5.10.

Q:—It don't do very much good unless we get it accurate.

A:—I tested it.

Mr. Newman:—What I would like to impress upon you

buttermakers is do it accurately. You buy milk and pay another cent per pound for butterfat, then you raise the test. The farmers who took milk to that creamery, if that milk was tested correctly, and it is fair to presume that this is accurate work of the butter-maker, they should have received \$2,000.00 divided among them from that creamery. You can see from paying 5 cents a 100 they have overstretched a point and raised the test a little higher than it should be. The people that hire you may insist on that kind of work being done. I want to call the buttermakers' attention to this. There is only one way to do this, and that is right.

I am intimately acquainted with a creamery situated in the west. I know how they do business. They don't guess at anything; they have absolute records of everything in that creamery, and a creamery running 10 per cent overrun and pay for it and get the business. All over Iowa and Nebraska, Kansas and Missouri are coming to appreciate this. This question is up to the man selling. Are we going to let this big concern swallow us up? It is going on all over the country, and the natural evolution of things seems to be for the big things to eat up the little ones. If you keep a record and know how much butter, etc., and insist that the stuff that comes in will market, no creamery can put you out of business. One of the questions up to the buttermakers today, is this very question, "Are we going to live or die?" The whole question hinges on two things, quality in your product, and carefulness in your work, and the buttermaker who guesses will fail and the fellow who doesn't guess will have his job after a while.

Mr. Newman:—This is a subject we all should think about.

Mr. Webster:—This question of the big thing eating up the little one is good. The hand separator is with us, it is here. We have to contend with it. If the hand separator is handled right on your farms it is a good thing. We can make good product from it. If the cream is delivered three times a week in the summer time a good product can be made with it.

Mr. Newman:—About the big concerns doing up the little fellows. I am one of the little fellows. We are running some creameries. We have put pastuerizers into fifteen plants the last year, and we will continue putting them in. We will have the same apparatus the big ones have, as smart men selling the butter as the big fellows have, and we shall try and do our work as accurately as they do it. We will keep our heads up, and I guess we can still do business at the same old stand, and the big fellows can get what's left.

Mr. Spies:—This is a subject of vital importance in this section, and while we have time, it is very well to dwell on it. We may want light on this subject, and there is a place to get it. Men are here who have been successful, and men here who want to be a success, and some think it is a pretty hard row of stumps to hoe. If Mr. Gilbert is here, we would like to hear from him. We will continue along this same line.

As far as the big fellow is concerned, eating up the little ones. I am one of the little fellows myself. I am doing business alongside of a big neighbor five miles from my place, and I have been on the best of terms. Will tell you why we just simply expanded the territory to such an extent that it is good for both of us. A good thing may extend from one neighborhood by the example that is set in that particular neighborhood. Now if you will go on the Vandalia road you will see what I mean. Down near Highland they have developed the dairy industry to such an extent that they derive that much money in that county from the sale of milk. The land there originally was much poorer than further down the road. By their going into the dairy business, to a large extent keeping the fertility for the land, they improved the land until at present it is worth four times as much as it was before. The land is richer and the farmers are prosperous simply because they have returned a portion of that which they originally got off the land to the land in the shape of manure, and sold the milk. They do not rob the land. And it will come in this county. Whether the condenser gets



the milk, or the creamery in the neighborhood, it is all dairying, provided you will follow lines laid down by the gentleman from Washington. He made it so plain to all of us that the dairy business is the sheet anchor of this country. It is a benefit that you cannot calculate by dollars and cents. Instead of turning poor land over to your successors, your children, you are turning good fertile soil that will produce something, and they can make a good business farming, whereas otherwise they could not. If a man will sell corn and sell wheat, it is not so much for this county, but you go down into Madison county where with every bushel it is 24 cents of fertility. The land is getting higher in price in dairy localities in the southern part of the State. Where land is selling for \$125 an acre you have got to get a return in order to succeed and make a living on land of that kind, while if you are dairying you are not afraid of \$200 an acre. Down in Madison county they have paid \$400 an acre for ten acres east of there, and they know the possibilities, and if he can pay such a price and succeed, surely here where land is cheaper you can realize more of a success. But you must get the right kind of a cow. I might add to the gentleman who spoke, that it don't only take dairy machinery and a market, but dairymen and dairy cows besides. Dairymen and dairy cows before market. You got to have those to sustain a market. It is just like a ship without water, it can't succeed on dry land. A creamery can't succeed without patronage.

Tomorrow morning will be a meeting of special interest to the dairymen, and I know that the dairymen are busy usually in the morning taking care of his cows, and preparing everything before leaving, but I want to tell you that they will derive full benefit by attending tomorrow's meeting; they can't afford to skip tomorrow morning.

Father Lammert:—Mr. Chairman, I would like to ask a question. You spoke about different crops being raised on farms, and I believe that it is an impossibility for our farmers in these counties who wish to go into the dairy work, to divide their attention to these crops as well. If dairymen, be dairymen from



beginning to end; if wheat growers, if corn growers, let them be that; that it is impossible for them to divide up their attention between corn, wheat, oats and cows. I don't believe our farms can stand that kind of treatment. I would like to have some one tell me if I am wrong.

A:—I take it that dairying is run in connection. We don't make it a side issue, we run dairying in conjunction with farming. I am from Southern Illinois. My brother over here spoke of the price of land, \$40.00 an acre, and that is right. I know of land like that and the men crop it and I never saw such a crop in my country before. They were offered \$5,000.00 and only got 40 acres. He grows corn, he grows grass, he grows oats, he grows cow peas and milks from 12 to 15 cows on that 40 acres, and sells feed every year. I know that land personally. That is how our county is running in the combination. He aims to raise plenty for the cows. He don't aim to raise to sell, but if any is left over he sells. We are milking—the same principle. They produce enough to feed the dairy cows and to make money, and put the fertility back on the farm. If we have a good crop and any over, we sell. In a year we aim to produce enough to feed the dairy.

Q:—Does he pasture his cows?

A:—He has a small pasture, a few acres.

Q:—I don't think you understand the question. His idea is that a man, if dairying, should make that his principal business. If raising corn to sell, make that his principal business. A man farming and dairying, he must raise corn, and I believe that he used the feed in the best way. We can raise alfalfa in this county. I believe Father Lammart's ideas are the same. He thinks a man ought to put his principal attention to one thing. If a dairy farmer, be a dairy farmer, and keep the right kind of a cow like Mr. Webster says.

Father Lammart:—I meant to bring out the fact that it is not well for a farmer to this year be dairying and wheat comes next year and so on. If he wants it to be profitable, he should put his whole effort to one thing. It is not possible for any man

to do everything perfectly. I didn't mean to say that therefore we don't have to raise anything but cows. We have to feed the cows. If you can do the four things you mention, you ought to do it. You have got to have one thing to work and work it well.

A Member:—This thing, that they can have 10 or 12 cows and they think they can get that milk to the factory and its all right. But they attend to their business in the day and sometime at night they come home and then they will milk the cows and so on, their attention is not to the cow, it is on something else and they are not paying the right kind of attention to the cow, that is what we have reference to, I think. Last March I hauled from seven different customers in my wagon and they represented something like 75 or 80 cows. I produced more milk than all the seven produced in the month of March.

Q:—What county?

A:—Bond county.

A Member:—This gentleman is speaking from Bond county, and I am from Effingham county, in the beginning of this dairy business. The farmers are getting educated in this farming business. This generation is somewhat different from the older gentlemen. I know that my grandfather broke up some land which was bought very cheap and put it under cultivation somewhere in the neighborhood of forty years ago, and I have produced better crops right now on it than was ever produced in those forty years, simply because it was the knowledge and the study I took up. A farmer never can learn his work perfectly. He farms from year to year, but never learns everything perfectly; there is always room for improvement. But the farmers of today, with the object lesson before them ought to look and see they are the right kind of farmers. When you have started on the right line, you must pay attention, when not looking after the cow, to the corn, oats, etc., and at the same time you got to milk your cows and pay attention to that. It is the advanced education that the country is getting that is bringing this all on. That is the way I look at it. If he is practical, he can have his

dairy herd and his hogs, corn, oats and wheat and pay attention to it from five or six in the morning. I don't believe in this night business. It always hurt me to get two suppers in one night. The day is long enough to get this work done in the daytime, and take ample time to look after the cows, look after the corn, wheat and oats in summer time, but don't get to doing this work in the night.

By the President:—That kind of talk does us all good. I wish to call your attention to the evening's program. I want your wives with you. They are just as much interested in this work as you are. They can probably remember something you might forget. We shall have three or four very good speakers and a very fine program. Tomorrow at 11:30, after we have talked over different breeds of cows from experienced men on the different breeds, we have an invitation to go over and visit the condensing factory, the Vice President is here with us and left this invitation with us. We shall all accept that.

Mr. Lee of the force of our Agricultural School has something to say to you.

Mr. Lee:—I have not very many words to say, but got here in time to say a little about a milk testing class which begins here tomorrow morning.

I suppose there are a number interested. It will be a good plan for a number to bring in samples if they will. Bring in all the samples you can of your cow's milk, and see it tested here. You will learn more about the test of milk, than you would by simply seeing some other man's milk tested, and be more interested.

Those who bring milk for samples, must milk tonight and fill half a bottle, stir up the milk thoroughly, pour it back and forth from one pail to another, and fill the bottle half full tonight. Milk the same cow in the morning, and fill the bottle full in the morning, so that the bottle contains half of last night's milk and half of this morning's milk. That will be a fair sample of the milk the cow has produced. We will test it and tell you how many pounds of butter the cow is making. If you can, weigh

the milk. Some of you here in town might like to bring in some samples. Please take advantage of this class. It will be of some benefit to you. Mr. Trueman will have charge.

Please hold up your hands, those who will bring in milk tomorrow?

Q:—Would we get some instruction in milk testing?

A:—Yes sir; the object is to give some help in testing milk.

By the President:—We will stand adjourned until 7:30 tonight. We will now give the separator men a chance to show what they have.

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## Tuesday Evening, Jan. 16, 1906.

7:30 P. M.

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The President in the chair.

We expected to have had a little music to start with, but we will have to go on with our program.

We have with us tonight one of the breeders from Wisconsin, Mr. W. J. Gillett, of Rosedale. He will tell us of the "Path of the Cow."

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### THE PATH OF THE COW.

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Br Mr. W. J. Gillett, Rosedale, Wis.

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Mr. President, Members of the Illinois Dairymen's Association, Ladies and Gentlemen:—

The State of Illinois affords natural facilities for dairy husbandry surpassed by no other state in the Union. A rich soil, a congenial climate, and easy access to two of the greatest market centers of the world, but it is not my purpose to eulogize

upon your beautiful state, nor to toss bouquets at your dairymen upon this occasion.

We all have our places to fill in this great field of dairy industry. Some have availed themselves of the opportunities at hand and have filled these places well. Others have not, and I believe in this respect, the dairymen of the State of Illinois are no different than the average cow keeper of other dairy sections of this country.

“From Plymouth Rock to the Setting Sun” we note evidences of the traditional trail of the cow. New England ministered the initiative in dairy husbandry, and the westward course has been steady, unswerving, unceasing, and the “path of the cow” has led us over the prairies and the plains; it has penetrated our forests all in their primitive state, and man’s curiosity and instinct has followed this trail in its various windings, so there is in reality, not only a figurative allusion but the deepest sentiment associated with the “path of the cow.”

Agricultural interests have followed civilization from the “lands of our Pilgrim Fathers” to the Pacific waters which served as a barrier for further extension, and animal husbandry has followed agricultural expansion to its most extreme borders.

History tells us that “Old Put” left his oxen yoked to a New England plowshare to accept a commission upon the battle fields of the Revolution, and the thought suggests that it was in reality the sons of the cow that supplied the muscle to first turn the sod of virgin soil. It was no other than these sturdy sons that hauled the prairie schooner westward, far beyond the fields of Putnam’s agricultural operations. And, indeed, it was no other than the matronly cow that kept pace with the procession, grazed along the trail and supplied the milk to rear the babes, who were destined to awaken to a realization of the importance and magnitude of American agricultural interests.

In fact, the dairy cow has gone on and on, perpetuating her kind, feeding the world, broadening your possibilities and mine, and acting a most important part in agricultural expansion and



prosperity, as well as becoming the foster mother of the human race.

Agriculture and our rural districts turn the wheels of every manufacturing institution of the continent; agriculture has founded and nourished our great cities, which have sprung up and grown almost beyond our comprehension; agriculture has caused our lakes and streams to be converted into great waterways for transporting and distributing the commerce of the world; and the "old cow" was one of the parties and pioneers who laid the foundation for greater possibilities and advancement in agricultural resources.

When the dairy industry of this country is stifled, agriculture is depressed to a sad realization of its importance, and when agriculture is depressed the whole commercial world feels the shock, and so I say, much of the growth and advancement of our rural interests can be traced to the dairy husbandman through the good offices of the cow. And so I say, America owes a lasting debt to the dairymen of the United States. Much for his dictation and endeavor in shaping the destinies of our rural districts, and since improvement in our dairy herds must emanate from the pure bred dairy herds of this country, our dairy farmer owes the same debt to the pure bred dairy cattle breeder, whose untiring efforts have stood as a valuable exponent for the maintenance and improvement of dairy performance in the cow.

The first office of the cow was to produce but enough milk to supply the needs of the calf, but through man's efforts in breeding, selection, and training we have today the distinct dairy breeds, the modern dairy cow. She has been produced by no element of chance, but is the result of well directed aims in breeding, the intensification of characteristic dairy qualities, and the successful mixing of agencies that produce the proper blend for practical utility and dairy ability.

The Holstein-Friesian, Jersey or Guernsey pure bred sire has been to the dairy interests what the Short Horn, Angus or Hereford pure bred sire has been to the beef producing interests, when crossed upon the cattle of our western and southern ranges,



or what the pure bred draft horse has been in improving the offspring of the western bronco, all of which furnish an excellent illustration of the importance of our pure bred animals and their value for purposes of grading up.

The incentive that prompts the average man to action in the love of gain, his interest and enthusiasm increasing or diminishing usually according to the size of the arc described in the swing of the pendulum of prosperity, and when we consider that a large per cent of the dairy cows in existence, are kept at an actual loss to their owners, we can not wonder at men losing interest and enthusiasm, but we do wonder that they do not search for the reason. In the first place a large per cent of the cows used for dairy purposes are not adapted to the purpose for which they are kept; and in the second place, many never have the opportunity of showing their money earning capacity from the fact of being under fed, neglected, and improper management on the part of the owner, and oftentimes when adversity closes its talons upon the resources of the dairy farmer, he himself is to blame by not giving to his business the attention, study and devotion that any enterprise would require to make it remunerative and successful.

There may have been a time when the conditions of the states of the middle west afforded a place for the dual purpose cow, but if so conditions have changed and the time has passed and gone, and the dairyman who is using the beef sire with the idea of producing a little milk and raising a little beef is neglecting favorable opportunities and standing in the way of his own financial advancement.

Instead of keeping a dual purpose cow to yield forty dollars' worth of milk a year, why not keep the special purpose dairy cow that will yield eighty dollars' worth? Instead of a dual purpose cow that will raise a steer, which at two years old will bring forty dollars, why not keep the special purpose cow that will raise a special purpose dairy heifer, which at two years old will produce a calf, convert her food into milk and herself command as high a price upon the market as the steer at the same age.

It is certainly impossible for a cow to be two things—a first-

class beef animal and a most profitable dairy cow—because the functions are widely different and the characteristics continually at war with each other.

The dairy cattle markets of the United States are continually clamoring for a high grade of dairy cows. On every hand dairy ability commands a price commensurate with the quality and for years to come there is little fear of over-loading the market. These facts, aside from the advantages in his own dairy, should encourage every dairy farmer in the matter of reaching out for animals of a higher standard.

At the present high prices of our farm lands I fail to see how we can afford, only in an incidental way, to allow the element of beef to creep into our milking herds and force us to compete with the beef producing interests of the milder climates of the south and west, where lands are cheap and winter stabling is unnecessary. In saying this I mean to offer no disparagement to the man who wishes to grow beef upon these high priced lands, though I do predict, that the production of beef in these sections must eventually be superceded by the dairy cow.

And, again, the fertility of the soil of our grain growing sections can not long stand the bombardment of continued cropping, and how often do we notice an expression of hunger plainly stamped upon the surface of our lands, of soils hungry for the fertility of which they have been robbed; soils, where rain and sunshine and nature exerted their every influence to bring an abundant harvest, continued peace and profit to the tiller of the soil, contentment and happiness into the rural home?

But we find no such conditions in those districts that have followed in the traditional path of the dairy cow, and these are the sections that today, stand out boldly, as an exemplification of the highest ideal of agricultural thrift and prosperity.

The reason for this is found in the fact, that the crops of the soil are milled through the cow and the product hauled to market, tide up in the smallest possible package, in the shape of butter and cheese. She nips our grasses, consumes our grains and forage crops, and converts them into a product that it sought

the world over as a staple article of food, and yet she returns to the fertility of the farm a large percent of those ingredients found in the food stuffs she has consumed, and when the dairy farmer buys a ton of wheat bran to feed his cows, he gets nitrogen, phosphoric acid and potash valued at \$12.30, as compared with the price of commercial fertilizer, or \$12.30 of the fertility of the farms of Kansas, the Dakotas and other wheat growing sections. When he buys a ton of cotton seed meal he gets \$26.16 worth of soil fertility from the cotton plantations of the south; a ton of oats, \$6.50; a ton of corn, \$5.66; or a ton of clover hay, \$7.50, and yet, as alarming as it may seem, when he hauls these feed stuffs back to market in the form of butter, he parts with fertilizing ingredients to the value of but 42 cents per ton, and so it would seem that eventually the dairy cow must come to the rescue of many of our run down farms that are fast becoming exhausted by continual grain raising.

Some of us are dairymen of a natural born instinct; some are dairymen with a knowledge acquired through study, observation and practical experience, and others are dairymen as they would be anything else, in name only. As in everything else, some are successful, others unsuccessful. Some of us fail because no branch of animal industry appeals to our fancy and because a dairyman's occupation is thrust upon us through force of circumstances, the vocation being distasteful and disagreeable, but more fail because of looking upon the business too lightly and not giving it the thought and study it requires. There is yet much for us all to learn and there is as yet plenty of room at the top of the profession. At the top means a vocation remunerative and pleasant, but at the bottom a life of drudgery and financial embarrassment. The dairyman's sky is not always clear, neither need it always be cloudy, if he will take a survey of his own conditions and try and cultivate an acquaintance with himself.

The idea that any one can meet with success in dairying by simply moving in that direction is a great mistake, for as in any other successful enterprise, it takes head work, energy and push, and a thorough knowledge of the subject in order to reach the

best results. In fact the interior of the dairy cow is a very dark place, and so intricate the silent working machinery that our search lights have failed to disclose many hidden secrets. However, from experiments and scientific research we are able to make many valuable deductions and have found that certain kinds of food are used by the animal to make milk, bone and muscle, while other varieties tend to product heat and fatty tissue, all of which give rise to the great subject of economic and scientific feeding. Much has been written concerning the compounding of well balanced rations for dairy cows and much valuable literature is available upon this very important subject that merits the most careful consideration of the dairy farmer of today, so there can be no plausible excuse for him not becoming a student in his profession if he has the inclination.

The dairyman of the middle west, and everywhere for that matter, can better existing conditions by better feeding and care taking, by closer selection and by better breeding. By better feeding I mean the more liberal use of a well balanced milk producing ration. The cow utilizes her food either for the elaboration of milk or the taking on of flesh, and she yields nothing in either direction except by food taken in at the mouth. If of a dairy temperament it is used for the secretion of milk, and, up to the limit of her capacity, she will respond in the milk pail in proportion to the amount supplied at the feed rack, hence if it pays to feed at all it pays to feed liberally, quite to the limit of her capacity, and it will be generally noted that it is the persistent and not the spasmodic liberal feeder that scores the best results. But there is another point involved in this feeding problem that necessitates the feeder in knowing the different individuals in the herd. No two cows are constituted with exactly the same dairy temperament. If some become too much reduced in flesh, the remedy will not necessarily be more feed, but a reduction in the amount of protein and an increase in the amount of carbohydrates, and on the other hand, if some become too fleshy, an increase in the amount of protein and a reduction of the carbohydrates is advisable. Many cows will be found, how-

ever, that will yield but little milk and take on flesh regardless of how the ration is balanced, and while the composition of the feed has a great influence even with such animals, they should be eliminated from the herd for they will be found wanting in the balance, and so the importance of closer selection is suggested. The dairy farmer has a friend for his financial advancement in the typical dairy cow, and he has two more friends in the Babcock tester, which should be frequently used, and the scales that hang in the cow barn, which with a little mathematical calculation, will show the money earning capabilities of the different members of the herd, aid in drawing the line between profit and loss, and afford advantages in weeding out and selection that we can not well do without. It is simply a business proposition for the dairy farmer to know with which of his cows he can exchange food stuffs for her milk with a margin of profit to himself.

The prevailing prices of dairy products in the United States during the past decade has stimulated our dairy industry, but on the other hand the corresponding high prices for our concentrated food stuffs, has, for a wider margin of profit, made the matter of closer selection and improved capacity in the dairy cow imperative.

I have spoken in flattering terms of the dairy cow and her relation to agricultural advancement and prosperity, but even if every farmer in America wished to engaged in the dairy business, this fact would not increase the number of existing cows, and if every dairyman wished to purchase better ones, it would not increase the number of good cows a single animal, and since selection only tends to weed out the poor ones, if there is to be any general improvement in dairy function it must come through breeding as a means of grading up.

I believe it both possible and practical within a very short time, with proper care, the more liberal and intelligent use of food stuffs, and the use of the pure bred sire of some of the distinct dairy breeds upon the milking herds of this country, for the dairy farmer to materially increase our milk, butter and



cheese product with a wider margin of profit to the producer, and still reduce the existing number of milch cows in the country at least 40 per cent.

But I fear too many of us fail to notice the dollar in the distance in our eagerness to procure the penny that drops at our feet, and to many, the sum of one hundred dollars or more expended in a good sire seems an extravagant waste, but I will say as I have intimated before, that the approved pure bred sire has been the salvation of all live stock improvement, and though I would sound the warning note against the pedigreed scrub, yet as a means of raising the standard of performance of the dairy cow, I firmly believe it highly essential for our dairymen to keep constantly at the head of their herds, carefully selected, pedigreed sires of some of the distinct dairy breeds. Animals selected from a long line of producing ancestry, where dairy functions and milk producing ability have become fixed characteristics. By the use of the dairy sire and the selection of the heifer calves from the best producing dams, a marked increase in dairy capacity will be in evidence as the result of the first cross. The second, third and subsequent crosses tend to intensify the qualities we seek, strengthens the blood lines for dairy utility, and though failures may creep in at times through atavism and reversion, the general tendency will be to lead us gradually up to a higher standard of performance; a standard up and away from the cow of ordinary ability with which we started, and so the question, will we neglect this great proposition of breeding, or will we learn to know that "like begets like," and that a higher standard of excellence means to us increased profits and less toil?

I believe that size accompanied by a certain degree of refinement is a desirable characteristic of the dairy animal and also a desirable characteristic of certain families of the different breeds, not because of any additional hardiness in connection with it but because of the increased capacity of the animal. And again I can conceive of nothing more disastrous than a practice which would tend to undermine the constitutional vigor and stamina of the dairy cow, hence in the matter of feeding, select-



ing, and breeding these become important factors and should merit our most careful consideration.

I would recommend the practice of winter dairying. First, for the reason that dairy products command a better price on the market; second, for the reason that farm labor is cheaper during the winter and other farm duties are not so pressing as to divert our attention from the many details that conduce to the comfort and well doing of our animals; third, for the reason that I believe it a more favorable time for the early growth of the calf, and fourth, and chiefly for the reason, that by the use of warm, comfortable stables, the succulent ensilage corn crop, good hay and a liberal grain ration, a maximum flow of milk can be maintained for a longer time during the lactation period and at a minimum cost of production.

The gun and the man behind it is the combination that does the most effective execution, and there is still needed in American dairy husbandry, more intelligence and a broader dairy education. Our lawyers, our clergymen, our physicians, and all our professional men are given years of mental training in our colleges, preparatory to launching into the actual business operations of their chosen professions, but the farmer boy usually finishes his training in the country schools and at an age when he little realizes the importance of mental discipline. But however this may be, he receives no special training that touches upon agricultural education. To be sure he knows how to hold a plow, how to drive a team, and how to milk a cow, but he knows no more about the composite elements of the soil than he knows about law; no more about a well balanced ration for a dairy cow than he knows about preaching, and until he is thrown into contact with these propositions in actual business life, where, if he learns at all, he learns through experience, which is often an expensive teacher. And so I say, there is need of a broader education, not necessarily in classical training but along the lines of our life's occupation.

It has been said, "He who makes two blades of grass grow where but one grew before is a public benefactor." So there

can be no question as to the position the live stock husbandman holds in the affairs of American agricultural progress and expansion, but with a broader and more thorough education in special lines of industry, and the practical application of such, there are greater prospects in sight, even greater possibilities for him who follows "the path of the cow."

" It is not through the whirl of pleasure,  
Nor from the din of strife,  
But out of the silent watches,  
Come the great needs of life."

By the President:—To those who were not here this afternoon, I would say that the gentleman who has just spoken, is what we might term the leading breeder of dairy cows in Wisconsin. He has brought his herd up, so that last year it averaged twelve thousand odd pounds. Any questions you would like to ask?

Q:—What strain of cow?

A:—Holstein-Friesian.

Q:—What average test?

A:—The milk of this herd was delivered to our factory. The lowest test for any one was 3.4, the highest for any one month 3.8, with a general average ranging about 3.6 to 3.7.

Q:—Can you tell how many two year olds and their milk average?

A:—I think we had one two year old that gave less than 11,000 pounds, and up to 13,000. We have some started at 11,000 and will be beyond that.

By the President:—All honor to Wisconsin for such men. We can do that at Effingham. These are the things we want you to consider.

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Vocal solo, "Sunbeams," by Miss Ruby Bissel.

Encored.

By the President:—We have with us tonight a gentleman,

while he is not a practical dairyman himself, knows a good deal about dairying in the early days of Illinois, and we will listen to what he has to say about those times. General Wilcox of Elgin.

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ADDRESS.

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By General Wilcox, Elgin, Illinois.

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Mr. President and Friends:—

I am very grateful indeed for the privilege you have given me of attending once again an association of dairymen.

I have heard many things tonight that remind me of other days, and to be frank with you, I have also heard many things indicating that the dairymen of this imperial commonwealth have not progressed as they ought to have advanced in the number of years that have been devoted to this great interest.

I remember the way we milked the cows in pioneer days. We sat on a one-legged stool. We did not have covered yards, but milked out in the open, in the old rail pen, and once upon a time, as I drove along the road, I passed a farm about milking time and watched the milkman. He was sitting on a one-legged stool. Presently he finished one cow, and rose to milk the next, and the stool stuck out behind him like a third leg, a wooden one. He had it strapped on. But we have drifted far from those methods.

Our pioneers, in Kane county, the birthplace of Illinois dairying, found the virgin soil to be good, producing fine wheat crops, and they made their homes there. Some prospered and built better dwellings on the land, and here and there a substantial farm barn in place of the straw stable. The quality in the land that produced wheat soon began to fail, and presently that pest of wheat, the chinch bug, appeared all over the land. With the failure of the wheat crop, a change was imperative.

Just then our magnificent city of the lakes began to assume

metropolitan proportions. I remember Chicago when it did not have half the people that now are in this lovely city of Effingham. Wealth began to pour into that city and brought with money and men of brains, who had to be accommodated with the comforts of life. Its hotel accommodations were entirely inadequate. Old Mark Baubien, landlord of the "Sauganash," used to tell of covering sixteen men with a single blanket as they slept clothed in their day garments upon the one carpeted floor of the crowded house. He put them to bed in pairs, and covered them with the blanket. The wearied men soon slept, and he carefully removed the blanket. By this time another pair was ready to lie down and be covered, and this way he had used the blanket successively eight times in one night. The growth of the city was marvelous, and local production was unable to meet the ever-increasing demand for table supplies. Fresh, pure milk, and sweet, palatable butter it was especially difficult to obtain, and those the hotels must have.

The low-lying level lands west of Chicago extend almost to the beautiful banks of the Fox river, and had been passed over by the pioneers. In 1850, the Galena & Chicago Union Railroad Company reached Elgin with its trains, and in February, 1852, Mr. Phineas H. Smith shipped from Elgin the first can of milk ever transported by rail in this state, consigned to J. Irving Pierce, the genial landlord of the Adams House at Chicago.

This single can drawn by oxen from the farm to the railway station, was the beginning of dairying as a distinctive business in our great State.

Who can realize the importance of the vast industrial revolution it inaugurated? In that now world wide dairy center, wheat, the certain impoverisher of the soil, gave way to the cow, of animal creation, man's best and most constant friend, from the cradle to the grave, and surely the gentle queen of pleasant, safe and profitable investments.

Chicago hotels and milk peddlers quickly sought the same source of supply, and hundreds of wagons were labeled "Pure Elgin Milk," even many years after Elgin ceased to ship a can

of milk. To meet this great demand, wheat farms were hurriedly stocked with cows, and for the first and only time in its history, Chicago was overstocked with a desirable commodity.

To utilize this over supply, farmers began to manufacture cheese as well as butter. Dr. Joseph Tefft, to whose efforts in promoting and systematizing the production, manufacture and marketing of dairy goods, the farmers of the great northwest owe an inestimable debt of gratitude, with Mr. Isaac Wenzler visited the dairy centers of the east, and upon report of their observations, many cheese and some butter factories were erected. The Chicago dealers put Kane county cheese into boxes branded "Orange County, N. Y., Cheese," and quoted and sold it at two cents above the price of that not so fraudulently branded. To remedy this wrong, the Elgin Dairy Board of Trade was organized in 1872, and during the following thirty years the sale of dairy products upon the open board reached the enormous sum of over \$147,000,000, and for the last four years has averaged about \$1,000,000 per month.

Borden's Condensed Milk Company has paid Kane county dairymen many millions of dollars, and Elgin quotes the price of butter for the markets of the world. Not a pound of milk or grain has been shipped out from that station for years—thousands of car-loads of feed have been shipped in, and the wheat impoverished soil has been restored to its pristine fertility

Such is a brief and very inadequate sketch of the beginning and development of the immense dairy industry of Northern Illinois.

If the farmers and business men of Effingham county could (or rather would) complete the hasty sketch, and realize its full significance of the future possibilities that lie before them, the seats at every dairymen's or farmers' association, held among you would be crowded with interested, active, paying members.

I have been absent from these association meetings quite twice the years Rip Van Winkle slept, yet I hear the echoes of the olden times, when we too talked about casine, protein and butter fats, and of the milk veins and milk escutcheons which



indicated the productive qualities of the cow. You are talking the same problems of the rearing and feeding of herds and the best breeds for milk, for meat and as all-purpose animals; of the care, manufacture and marketing of the product, over and over again, and it sounds very familiar. Great, but not adequate, progress has been made. But, friends, dollars and cents are not all there is in it. Manufacturers have become rich, and the farmers are becoming rich, yet there is something, gentlemen, beyond riches, and something beyond the detailed statements we have heard in the management of this sort of a business.

You talk about cows, you talk about cattle, you talk about the manifold details of the work, but I have heard not a word about the man or the woman or the boy or the girl, and here is the startling weakness of your slowly advancing line. When Dewey sailed into Manila bay and destroyed the Spanish fleet, and when Togo wrecked the magnificent squadron of the Russians in the sea of Japan, it was not alone because of his superb equipment. Rogesvenski's was equally fine,; it was not all in the prodigious weight of his guns, for his enemies were of equal number and caliber. It was the man behind the gun. It was the little Jap, a better man than the Russian.

Are your farmers properly training your boys and girls for the successful development of this great industry of yours. I am talking more to the farmers now. I see a class of sharp, shrewd, intelligent men here with us, indispensable assistants, who are selling many appliances for your use and convenience, and they are well fitted for their work, but farmers are you well fitted for your work, which lays at the foundation of it all. He who was called "First in war and first in peace," the great father of our magnificent republic, said, "That of all the pursuits of men, the most healthful, the most useful, and the most honorable, is agriculture." Farmers, do you believe that? Do you act according to such belief? If you do so believe, do you try to attain that high ideal which belongs to you. I believe it from the bottom of my heart. Look back over the history of our Republic and see where our truly great men came from. The

splendid man who today is President of this magnificent land of ours, if my memory is correct, is the only large city born man who has ever held that exalted office. They have come from the farms and smaller towns, rural communities. Washington was a practical farmer; Washington was a successful farmer. Washington, with all the mighty responsibilities resting upon him as commander in chief, and afterwards as first President of the republic for two terms, never for a day lost the active control and management of his farm at Mt. Vernon, and deemed it his highly honorable occupation.

I say that the farmer is the king of men. The old Declaration of Independence said "These colonies are, and of right, ought to be free and independent states," but they were not save in embryo; they were not free and not independent, and not states; yet in a certain limited sense the statement was true. The agricultural people of this country, in a similar, certain sense are and of a right ought to be, and in some better day, will be kings of men. And among the kings of men, the dairymen ought to stand as the king of kings. But what, my farmer friends, what are you doing to attain such ideals for yourselves, or for your children.

This constant iteration and reiteration of the details of your great industry suggests a story often admirably told by Hon. A. M. Herrington, one of the ablest lawyers of the State, who said that on a bitter cold morning, with the mercury far below zero, he was called a little before sunrise and told a man urgently desired to see him quickly in the kitchen. Hastily putting on a portion of his clothing, he came to the kitchen and found an old bachelor client who lived alone, some seven miles distant, and who was half frozen from his long, cold ride in the gray dawn. A stiff hot toddy loosened his tongue and unfolded his mournful tale: "You remember, Mr. Herrington, the fine bull calf your brother James gave me Well I took the best care of him, and we became great friends. He grew to be the finest bull in Kane county, and I used to talk to him and tell him all my troubles and he seemed to sympathize with me. He took sick and yester-

day he died. And now, Mr. Herrington, I have nobody to go to but you, and I feel awful bad." Now, when you laud and care for the cow, though I esteem her man's best friend among all created animals, still I beg of you in high heaven's name, do not place the cow or farm above the family. I desire the farmers of our land to think and to act more wisely and nobly than that.

Too long we have allowed the idea to prevail that the dullest boy or girl would do for the farm, and allowed the brightest to seek the professions, or a situation in the city. A sad and ruinous mistake. Too long we have taught the farmer not to be above his business, and kept his ideals and his living too low. Wrong, all wrong. The man and the woman should stand shoulders above the details and drudgery of business, not in any way neglecting these, but clearly recognizing the noble truth that the individual is vastly more than the occupation. The dollar is a mighty power, but the man should be far mightier. Get all the dollars you honorably can, but don't can all the dollars you get; use them most wisely and most profitably; always remembering that their first and noblest use is in the real betterment of your families and yourselves.

I once knew a dairyman, who upon 40 acres made a larger profit, and far more pleasantly, than his adjoining neighbor made upon 120 acres. The one intelligently standing above his business, the other ignorantly struggling beneath his. Dairymen, I plead not for less, but for more intelligent care of the stock and farm; more thought, more study, deeper research and for the real high purpose of it all, which should be nobler manhood and womanhood, more life of intelligence and joy, less death of stupidity and low existence. I plead for the home, for the boys and girls, who will be the men and the women of tomorrow. I want the farmers' associations in its personnel to equal in all points of business acumen and gentlemanly culture, the bankers' conventions of the day. Nearest to nature, and to nature's God, there is no occupation in life that offers so noble rewards for exalted life as does the pursuit of agriculture in this great commonwealth of Illinois. But with deepest mortification we must

note the untidy homes and repulsive school houses so prevalent in the land, and the slovenly men and careworn, ill-dressed women, who so frequently inhabit these homes. 'Tis true that "dress does not make the man," but 'tis equally true that dirty, vile smelling garments seldom cover a clean, intellectual person. Acquiring more land and stock, and making more milk, at the cost of the comforts and ordinary refinements of life, is not success, but dismal failure, even if it brings riches. Yet slovenly drudgery rarely brings even financial success. As a rule, the attractive house, and becomingly dressed, well bred personality contributes largely to desirable financial results. Others are apt to measure us by our own standards. And so many unsightly, dilapidated school houses, desolate, unsanitary, with offensive, disgusting out-houses the most prominent feature of the place, abound throughout our country. Can these resorts develop the instincts of clean, wholesome manhood, the charm of pure, refined womanhood, we so hope our boys and girls to attain.

Farmer husbands, I charge you be more tender and true to the wife who, in the bloom and beauty of girlhood, gave her young life into your keeping. Your manner is fashioning her ways. Farmer wives, be loving and considerate toward your husbands, by your stimulating example leading to nobler ideals and acts. Fathers and mothers remember the sacred responsibilities of parentage. Farm and stock and implements abide for the day, but the immortal lives you are projecting into the limitless future fashion the republic and becomes a part of the endless eternity. Sadly lacking in the noblest attributes of manhood is the person who does not ardently desire to transmit the splendid inheritance the past has given us, not only unimpaired but greatly enlarged, to posterity. And who has equal opportunity with you who live in the midst of nature's storehouses of exhaustless beauty and wealth, ceaselessly beckoning you to broad and noble living, opening your dim eyes, and calling your dull ears, inviting you to explore her countless mysteries, and develop her lavish wealth.

Luther Burbank listened, and saw, and evolved the Burbank potato, which the Secretary of Agriculture has declared to have

benefitted the food supply in that one common vegetable alone to the extent of more than a million dollars. He has improved the size, form, color and fragrance of many flowers and fruits almost beyond belief, and it is said that he has changed the cruel and worthless cactus which covers the hot desert plains of the southwest into a spineless plant bearing profusely a most delicious fruit, and a highly nutritious leaf and stalk. Very few, indeed, can expect such achievement, but there is not a plant upon the soil, nor creature upon the farm, that is not susceptible of wonderful development and improvement.

Great advance along these lines has been made, yet far greater impends in the near future. The Secretary of Agriculture tells us the farm products of 1905 were worth at home on the farms the enormous sum of \$6,415,000,000, a sum so vast that our bewildered faculties cannot comprehend it. He says that every sunset during the last five years, has registered an increase of \$3,400,000 to the value of the American farms, or an aggregate increase of \$6, 133,000,000, and that by continuing this rate of increase for ten more years, the farmers will have produced one-half of the total wealth accumulated by the nation in three centuries of toil.

Do not fail to note the significant changes occurring in the last two decades. When Illinois' most illustrious son first became President, cotton had long been the unchallenged despotic king. Today the annual farm product values are: Corn, \$1,216,000,000; milk and butter, \$665,000,000; hay, \$605,000,000; cotton, \$575,000,000. And do not overlook the significant fact that our cow calmly chews her cud of corn and hay, consuming a very large portion of it, and is the gentle, contented queen of today, while close behind her cackles the busy American hen.

The export of \$12,000,000,000 worth of farm products during the last sixteen years, has reversed the balance of foreign trade which had been against us, and given us a favoring balance of over \$5,000,000,000.

I well remember when the vast prairie portion of our great State, stretching broadly from near Vandalia to Peoria, including



this county of Effingham, the "Grand Prairie," was thought almost valueless for want of fuel. Behold the marvelous transformation. Stephen A. Douglas' legislative acts resulted in the construction of the Illinois Central railroad, which contributes directly each year millions of dollars to the State treasury; the vast silent prairie becomes a garden land of almost limitless productivity, dotted with beautiful villages and cities, vocal with the hum of industry, and musical with the notes of happy progress, the rich body of our splendid commonwealth.

Nor yet are the outlines of the wondrous story sketched. From beneath this fertile soil, we are mining coal, more valuable far than the fabulous wealth of famed Golconda. Within a radius of about one hundred miles, centering at this beautiful City of Effingham, we are producing coal of greater value than the combined golden output of California, Colorado and Alaska.

The possession of such enormous wealth and seemingly boundless resources is fraught with imminent peril to individual and governmental character and permanence. But one course can avert the ever accompanying danger of such opulence, namely, the proportionate advancement of our people in knowledge, and the graces of broad, genuine christian manhood and woman hood. The christian culture of the rising generation. And so my farmer friends, I plead with all the earnestness of the mature years of a long and active life, for our homes and children and our country, because we love these more, and not the farm and cow less.

Standing upon the apex of our towering industrial and financial prosperity, holding these securely beneath our feet; with what exultant joy and reverent gratitude we trace the patriotic toils and perils of our fathers, who elevated this mountain. Behold the glory of our national banner beneath whose protecting folds we dwell in peace and security, and rejoice in the proud history of our great commonwealth.

Illinois commanding at Cairo the navigation of the majestic Ohio and Mississippi, the most important strategic points in the nation, and bordering two of the old slave states, upheld the

nation in its gigantic struggle for life and perpetuity. Illinois proved itself the real Keystone State of the Republic. But before she can occupy the proud commercial position to which she is entitled, her almost limitless resources must be developed by an educated citizenship unsurpassed in all the world, our boys and girls in their developed manhood and womanhood. For this I plead.

Not without thy wondrous story, Illinois, Illinois,  
 Can be writ the nation's glory, Illinois, Illinois;  
 For on the record of the years  
 Abraham Lincoln's name appears,  
 Grant and Logan. and our tears, Illinois, Illinois.

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By the President:—

The next topic being similar, probably we had better hear Mr. Jorgensen, of the Illinois Dairy School, on the creamery buttermaker, his duties and responsibilities.

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#### THE CREAMERY BUTTERMAKER—HIS DUTIES AND RESPONSIBILITIES.

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By Mr. F. A. Jorgensen, Urbana, Ill.

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Mr. President, Ladies and Gentlemen:—

I hesitated to some extent in accepting, as I have only been in this country a little over four years, and am not yet able to master the English language. If you have any difficulty in understanding me, I hope you will bear with me on that account.

One of the great enterprises confronting this vast continent is the future development of its dairy industry. Constant and great is the demand for good men along lines of dairy manufacturing, and great opportunities have been offered young men

pursuing this phase of the business as a life work. The progress and development of the dairy industry as a whole has been very slow in this country, and it may be justly said that it is within the last thirty or forty years that the manufacturing side has made any progress or improvement. But it may also be justly said that the development has been so great and the improvements so perfect that the best of results are obtainable, if the principles, which have been worked out and are being taught by the leading dairymen and by the professors in the various dairy schools, are observed. There is a great field of opportunity yet. Time has not yet permitted an extensive growth of the new-born facts; and at the present time, there seems to be a great need of educated buttermakers.

Fifty years ago, the creamery men were confronted by a different proposition than they are today. At that time, the enterprise depended entirely upon the skill and judgment of the butter or cheesemaker, and there were very few who obtained what today are called good results. They were handicapped in those days. They had no machinery; none of the modern facilities, and no rules to go by but their own sound judgment and the few things they might observe and gain by practical experience. Practical experience, of course, is today one of the best recommendations for a buttermaker. He must know how to do the work and all about the different implements in use. But to get the best results and the greatest profit, he must look into the theory of dairying; he must put it into use and apply it every day. To do this the buttermaker must have a liberal education. First, he must have a scientific knowledge of his work, and a chemical knowledge of the constituents of milk and its products; know something about bacteriology, and fully appreciate the importance of those tiny organisms, termed bacteria, living in milk, and understand their action upon the same. In fact, he should have a fairly broad view of the interesting and vital study, the science of dairying. Second, he must have a fair knowledge of the English language and be able to read and write intelligently.

Besides, he will meet a great many different kinds of people, and his ability to deal properly with them will depend largely upon his use of language. Third, he must, to some degree, be a mechanic; fully understand the operation of the different kinds of machines used, and how to repair them; know how to take care of them, and keep cool if anything should happen. Fourth, he must possess skill, be quick in his movements, for there are a great many to be executed during the operation, and many times a certain amount of work is to be done in a decidedly short time. In creameries where the operator is alone, he will at times have his hands full, for he has his boiler and engine to watch, the separator to look after, all the while he is weighing in milk or cream. Patrons will be asking questions of various kinds; by the entrance is a customer waiting; the operator has it all to do and it means hurry. Fifth, he must have natural abilities, for the requirements and responsibilities demanded of the creamery today are so much greater than those of the man of half a century ago. To be a leading creameryman, he must not only have much wider experience along practical lines, but also be able to carry out the theoretical side of the question. Last, but not least, he must be neat in appearance and pay attention to small things.

When one steps inside of a creamery and takes a general view of the whole affair and of the man operating it, the appearance of the man will, to a large extent, decide the judgment and reputation of the product. If a customer or dealer in dairy products, upon entering the creamery, is confronted by a shaggy looking buttermaker wearing a pair of greasy, horrible-smelling overalls, and handling the products manufactured with dirty and greasy hands, his appetite for such a product is not going to be very great. Neither can one expect the best trade nor the highest price for butter handled in that manner; nor can anyone have much faith in its keeping quality.

Therefore, the buttermaker should always take special pains in looking neat, wear clean clothes, and otherwise keep clean.

The use of tobacco in and around the creamery should be forbidden and no buttermaker, chewing tobacco, should be allowed to be near while the butter is being worked and printed, and it is his duty to see that no other person be smoking or, in other ways, bring in strong and disagreeable odors that may be easily absorbed by the butter. Other and seemingly smaller things he must also take into consideration. He should keep his hair combed and brushed so that loose hairs and dust that might gather in it, will not drop into the cream or on the butter while working around it. His finger-nails should be kept clean and clipped short, and shirt sleeves or other bacteria-infected articles should not hang out over the hands or be allowed to dip into the cream nor touch the butter. Cleanliness is one of the fundamental and underlying principles of dairying and too much stress can never be laid upon it nor can it be overdone.

#### Knowledge Required.

These and many other thing can be requested of a creamery operator and for them he can be held responsible. But they are other and more important duties and requirements demanded of him, and rightly so. There is expected of him what might simply but clearly be expressed in the term knowledge; and he is not expected to have knowledge of a single thing as a good many people think, that of putting the cream into the churn, let it turn until the butter comes, then draw off the buttermilk, mix a little salt in and squeeze out as much buttermilk as possible. Such was the idea of buttermaking a great many people impressed upon me, and they thought it was all the buttermaker needed to know. Of course, it is necessary that he understand the mechanical process of buttermaking, only a little more thoroughly than expressed above.

But there are other and more important things to know. Foremost among them is his thorough familiarity with, and his full appreciation of the uses and abuses of the Babcock test and the scales. For upon it depends the justice to the patron and the success of the creamery concern, to some extent. Simple and



easy to learn as the process is, yet there are a great many small points to be taken into consideration. It may be expected of him that he be able to overcome such difficulties as he occasionally will meet so that not merely guess work shall be relied upon. He is held responsible for the tests, and the figures presented by him, and he should, at all times, be able to back them up. In places where hand separator cream is being gathered and considerable testing is to be done from day to day, it is his duty to see that the tests are properly made. Occasionally a test will be spoiled and a bottle broken, and in that case he should keep patient, do the test over again, and not be satisfied in giving the figures from the time before. It means much to the patron and the concern he works for.

This leads to another and quite important duty of the creameryman, that of being able to take correct samples and preserve them. It is just as important to have the samples taken correctly as it is to have the tests properly made. Here is where special pains should be taken not to make any mistakes. This is especially true of composite samples, for a mistake made there can never be altered. If a sample is put into the wrong bottle or partly spilled, or improperly preserved, it is something that cannot be changed. There is everything in favor of a more extensive use of the composite sample system, but of course, not unless in the hands of perfectly reliable men. The small things must be observed and the sense of responsibility of the man handling composite samples should never part from his mind. It is his duty to go over them every day to see that they are thoroughly mixed and kept in good shape.

#### **Familiar With Starters.**

Starters are another thing the buttermaker should be familiar with. They are a necessity for making the best grade of butter. Their value cannot be overestimated, nor can too much care be practiced in handling a starter. In making a good starter cleanliness is the first principle to be observed, and it is the buttermaker's duty to see that the utensils used are properly cleaned and ster-

ilized before the starter is put into them. They should never be exposed in places where dust or bacteria of any kind will have a chance to lodge in them. In fact the value of sterilization immediately before use cannot be too fully realized, and the much condemnable habit of wiping the cans with a cloth afterwards, though the cloth is seemingly clean, should never be practiced. Neither should the inside of the vessels be touched by the hands, although they may seem clean, nor should cold water be poured into them for cooling purposes, but always applied on the outside. It is necessary that the man handling starters should wear clean clothes, so that dust or other foreign matter will not drop into them while being propagated. Many times can be seen the practice of dipping unsterilized vessels into the milk after it has been pasteurized, or a finger will be stuck in for a quick estimate of the temperature, thus inserting undesirable germs and defeating the object sought.

Great is the study of dairy bacteriology and although much is known at the present about the different kinds of bacteria, and the part they play in milk production, there is much yet to be discovered and worked out by the bacteriologist. Several good books have been written which are of immense value to creamerymen, and it is recommended that every buttermaker secure some of those books and thoroughly familiarize himself with the facts they contain. They are written by the leading authorities on the subject, and are not only of value for the better understanding of the theoretical part, but they give practical suggestions on the methods used by the most experienced men who have made large quantities of good butter under different conditions. From them can be learned the process of ripening cream; the effect of the different degrees of acidity upon the finished product; the germ desired; the benefit from it, and the change that takes place from its work and from the action of its products upon the different constituents of the cream.

It is a problem that should be fully understood by the buttermaker so that, if conditions permit, the desired grade of butter

may be produced. With the available facilities for determining acidity it is today but a mechanical step and one for which the buttermaker can be held responsible. Here is another strong point in favor of having good books, of studying them, and of fully understanding the facts explained in them. There can be learned all about the use of the acidimeter and the corresponding methods used for determining the acidity in milk or cream and they can be compared. The advantage of one over the other can be pointed out so that one will be able to select the one best suited to his need, and still have a full appreciation of all of them. And if we look over Professor Decker's book on Cheesemaking, we will find one more device, the Wisconsin curd test, of great value to the creameryman. Its influence is there clearly pointed out. It has been found a necessity for the cheesemaker, and I assure you it is one of the best methods the creameryman can apply in convincing the patron of the necessity of taking good care of his milk.

When it comes to the finishing of the product, skill means much. For the more neatly it is done up the higher will be the score and the price. There are quite a few important points to be observed in the process of manufacturing butter. First, of course, is to have the cream properly ripened and cooled to the desired temperature. Next is to stop the churn at the right time, get enough salt and color added to suit the market; get the butter worked just right for a good body means a higher score; put it up as neatly as possible, and in a shape that will be most desirable for the market; finally to observe as much sanitation as possible from the beginning to the finish. The grade of butter depends somewhat upon the style of churn in use, but it is expected that most creameries will have one of the more up-to-date and improved styles installed. They are a little more complicated than the box or barrel churn, and it may be said they are considerable harder to keep clean. They must be kept clean from the beginning and it is the buttermaker's duty to see that such measures are taken.

**Pasteurization Also.**

Pasteurization is another process the creameryman ought to be acquainted with. Its advantage is a well known fact and need not be discussed. The process itself is simple and can easily be understood by everyone. Besides there are but a few points and facts to have clear to be a successful operator of the pasteurizer. Most of the trouble comes in the summer time when sour cream is being delivered. The problem of how to overcome those troubles has not been quite solved yet, but undoubtedly the near future will bring more light on that subject. At present there are but a few points in handling pasteurizers that require special care, and those are: Refuse all cream too sour to pass through the pasteurizer without curdling—that is an essential point, and will hold good at all times; start the pasteurizer right; see that the first cream does not get overheated nor curdled; keep a constant temperature throughout the operation; have the pasteurizer and cooler work in harmony, and keep both clean, and the room free from odors.

It is the creameryman's duty to see that the vats are properly cleaned. Milk should not be allowed to cook on any place and they should be rinsed with scalding water or steamed. The outside of the vats should be cleaned and painted when needed as well as the underside of the tin part of the vats. He should see that this is done at least once or twice a year, so that water and dampness is kept away from the tin, thus preventing it from rusting. None of the pipes must be overlooked, but thoroughly cleaned and steamed every day. The failure to see the necessity of keeping these things clean is found to be one of the weak points among our creamerymen today, and a thing too badly neglected. Upon discussing the matter with a buttermaker, twenty some years old in the business and who had traveled considerably among the creameries in Northern Illinois and in Wisconsin, I learned that it was not only a weak point, but a difficulty to get them to do it even after their attention had been called to it. I will here quote some of the statements made by him. He said:

“It is a fright to get into some of those creameries. Soem of them are all right and the boys do their uttermost to keep them as clean as possible. But I have gone into creameries again and again, put on my overalls and helped the boys to clean up. I would take the steam hose if one was available or make some sort of connection so steam could be applied, and you would be surprised to see the amount of dirt and old horribly smelling milk or cream that could be blown out of pipes, gates, or other places where it had a chance to gather, and I found pipes that it was impossible to get the smell off. The gate in the cream vat is a place I found badly neglected and I believe it to be the cause of a good deal of the poor butter on the market. The best way and about the only way I found to get them to keep that gate clean was to place a bottle brush somewhere on the cream vat so it was impossible for them to clean the vat without seeing the brush.”

Such were the statements, and a good many more of the same nature could be mentioned if time would permit. But it is enough to show the need of improvement among our creamerymen and their duties toward cleanliness. The floor in the creamery room must also be kept clean. Grease spots of any kind should not be allowed to accumulate on the floor and with the chemicals and different kinds of washing powder available it is an easy matter to keep them off.

The ceiling, walls and windows should be kept as clean as possible, and the man in charge should see that they be painted when needed, as well as the pipes in the room. Utensils used during operation should be properly cleaned, sterilized and put in place. Tools used should have a certain place and not be thrown where last used.

But before we leave the creamery room, there is one more machine, the separator, toward which the buttermaker has duties. It is a very delicate piece of machinery and its durability depends entirely upon the care it gets. Therefore, too much care cannot be taken in operating it, and before attempting to do so the operator should get thoroughly acquainted with the different



parts of the machine, so that he will know how to put it together correctly. He should understand its theory, or the principle upon which it works; know something about the different causes influencing its efficiency and durability. Great are the responsibilities that rest at all times upon the man operating a separator for, it is an expensive piece of machinery.

If electricity is used as power, in the creamery, all that is required of the operator is to know how to turn the switch and oil the motor. But where gasoline engines or steam engines are used, the requirements are greater. He must know how to operate them and how to take care of them. He must see that they are properly oiled and kept clean, and where the last mentioned is used, that a constant supply of steam is applied. To do this, he must know how to take care of a boiler and be an expert fireman. Here is where great responsibility rests upon the creameryman for the boiler is not only expensive and easily ruined, but it is dangerous. He should at all times know where he is at; see that safety valve and water gauge are in order; keep a constant supply of feed water and have it as clean as possible, and keep the flues cleaned and free the inside from scales as often as needed. It is to be expected that he understands the theoretical principle of a boiler and steam engine and the various influences affecting its efficiency. Order and cleanliness should also be observed in the engine room; the floor should be kept clean; oil and grease should not be allowed to accumulate on the floor and be tracked all over and the tools should be kept in place. Outward appearance of the creamery should not be neglected. Trash of any kind should not be lying around and worn out utensils should be piled orderly if necessary to have around; water pools should be kept off the driveway and the holes filled with cinders. The small things must not be overlooked, for upon the creamery's general appearance depends largely its reputation.

And last, but not least, has the creameryman duties toward the patron. They are numerous and I will not attempt to relate

them here. You have just listened to the relation of the creameryman and patron, and I am sure I can add nothing to what has been said. In closing, there is but one point I should like to emphasize: The creameryman should be fair in his dealings with his patron, treat them all alike, have them be his friends, that they can work in co-operation. But above all things be honest.

By the President:—We are now going to listen to the quartette, which will close our program for this evening.

The cattle will be here in the morning, and the session will open at 9:30.

Adjourned until Wednesday morning, January 17th, 1906.

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## Wednesday Morning, Jan. 17, 1906

9:30 A. M.

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By the President:—Meeting called to order.

I will now fill out the committees. The one yesterday on memberships were J. W. Sliger, Effingham; J. E. Snyder, Rockford, and L. A. Spies, St. Jacobs.

Now I will appoint the Committee on Resolutions:

W. R. Kimsey, Tomaroa, chairman; F. G. Austin, Effingham; D. C. Haeger, Dundee.

For the Committee on Nominations I will appoint:

J. D. Mason, Elgin; M. S. Campbell, Genoa; Ed. Walton, Anna.

I would say to these committees, I wish you would get together and report this afternoon, if possible. They usually leave the election of officers until the last thing on the program and there would be probably about 25 people present. This is a live association and we want everyone a member to have a voice in naming the officers for the future. I shall probably call this matter up when this room is full. Would like to have them

consider the matter carefully this noon and be in shape to report this afternoon if called upon. I am talking to the Committee on Nominations now. We need a little new blood in it. A new head to it for the next year and probably some other changes which this committee will see meet to make.

I would state that the Bissell College of Photography and the Illinois College of Photography is located in this beautiful city, and Mr. Bissell, who is also Mayor of the city, would like very much to have us call at the studio. Wants us to be at the college between eleven and twelve today, and has made it 11:15 for us to go there. He wants to take a picture of the association as an association, and it will appear in the next annual report. So please go directly to the college from here at 11:15. It is the only one in the world. From there we will go to the condenser at 11:30 and go through and see them make condensed milk.

It has been thought best, on account of the shape are roads are in now, to take up the cow question this afternoon and substitute the afternoon's program this morning, and the morning program be given this afternoon. If many farmers are here that must have it this morning, they will make it manifest. Don't be afraid to speak up if any here feel that they came on purpose to have the cow proposition this morning and not this afternoon. I hear no objection and hence the program will be changed as mentioned. Mr. Janes, of Hinsdale, the head of Brown Swiss cattle of that place, you all know, it is known the world over, and he has gone to the expense and time of shipping one of his best cows down here for us to examine. She is down here in the first livery barn. We had hoped to have her on the stage, but it was an impossibility in this opera house. I would like to have you all stop there before coming in this afternoon. Mr. Janes will be there and will see you. We will adjourn then later on to see the different cows.

In regard to your railroad certificates, the secretary has secured a fare of one and one-third fares on the certificate plane

without any required number, but the certificates must be handed in to the secretary. He has to sign them and they then go to the depot to be stamped. If you will hand them to the secretary at the desk here, they will receive the required attention.

By the President:—We will listen to Mr. Newbery on “Relations of Buttermaker and Patron.”

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### RELATIONS OF BUTTERMAKER AND PATRON.

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By J. R. Newbery, Flora, Ill.

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Mr. President, Ladies and Gentlemen:—

It would be an easy matter to describe the relation of the buttermaker to the patron. He stands between the patron and the manufacturer, whether individual or a corporation. He also stands between the patron and the consumer. Again, we might call him a finisher, for he takes the raw product of the dairy and finishes it for the market. But when your Secretary suggested this subject, he did not expect us to take it in the narrow sense, but the broad. The relation and duty of buttermaker and patron.

I have already described the buttermaker's relation as that of middle man, now let us see what is his duty to the patron.

I would say that the buttermaker's first duty to the patron is to be a first-class buttermaker, and make butter that will grade extra all the time, for upon his standing as a buttermaker depends the price of butter fat to the farmer, and upon the price of butter fat depends the success of the creamery and of its patrons.

This subject, “The Relation of Buttermaker and Patron,” is a subject of very great importance, a subject which I am not capable of handling as it should be presented here today, and what I fail to bring out, or make clear in the time allowed me, I trust you will bring out in the discussion to follow.

I think in telling of the relation of the buttermaker to the patron, we should also speak of the relation of the patron to the buttermaker, and where and in what they can help each other.

I said his first duty was to make butter that would grade extra, and you know it costs no more to make that kind of butter than it does first or seconds, and it is the patron who is nearly always the loser. Whether it is his fault, or the fault of some neighbor who sends his milk to the creamery in such a condition that it is impossible to make good butter, or whether it is the fault of the buttermaker remains to be seen. In either case, we might say the fault lies at the buttermaker's door, for it is his duty to the patrons of the creamery to see that each patron takes proper care of his milk, and delivers it to the factory in good condition. And it is the duty of the patron to see that his milk is all right when delivered. If milk is very bad, I say reject it; if just a little off flavor, call the attention of the patron to the fact and make suggestions to him in regard to the remedy. Explain to him that one can of poor milk might cause a loss of one cent per pound on butter for the day's run, and as the expense of manufacturing would be the same in either case, the patrons must stand the loss. Show him that what will benefit one, will benefit the other also; that there is one common interest between the creamery, the buttermaker and the patron. Good milk, good facilities for handling and a good buttermaker will mean good prices to the patron, and a reputation for the buttermaker, the creamery and the product of the factory.

Get the confidence of the patrons and endeavor to keep it. A butter maker should be honest and industrious, painstaking and accurate, even to small things, having a thorough knowledge of the working and handling of all the machinery of the plant, and keep it in good repair, careful to avoid accidents causing expense and delaying the patrons while waiting for him to do some repairing which should have been done the day before in the afternoon. He should work constantly to increase the business and reduce the expense of manufacture, and to reduce the cost of manufacture means to practice economy, and he should try to increase the output.

Show a patron that a creamery that is making 200 pounds



of butter per day at a cost of three cents per pound, could make 600 pounds per day at a cost of two cents per pound and have more profit, and is co-operative, the patron would get one cent more for the whole amount of butter fat furnished to the factory. So it is to the interest of both to build up the business.

Show him that he can increase the quantity of milk by keeping good cows and giving them proper care, rather than by increasing the numbers. How shall the farmer improve his herd, is the question of the hour. It is difficult to go out and buy good cows, for the man with cows for sale wants to sell the cows that are not the best ones. Here, Mr. Buttermaker, is an opportunity for you to help your patrons. Urge them to procure good sires and start with him as a foundation to build a good dairy. Keep the calves from the best cows of the herd; take proper care of the calf, also of the cow after maturity, and she should bring her owner five or ten, or even twenty dollars more per year than the dam. It costs but little more to keep a good cow than a scrub. It takes no more room, no more time, and no more feed to keep up the cow, only a little more material from which to manufacture milk, if you please, for a cow is a machine, and, like the factory, should be operated at full capacity to get the most profit from her.

Get the patrons to read current literature on dairying. Our best patrons, those who do best for themselves and bring us the best milk, are those who read and see what others are doing. They get new ideas, get interested in their work, and are enabled to see the ruts and endeavor to keep out of them, or if they are in them, to try and get out.

Just to show the difference between the patron who reads and the one who does not read daily literature, I quote from the cow census report made by Mr. W. H. Jenkins, in Hoard's Dairyman of February 7th, 1901, of fifty Pennsylvania farmers. Of each one was asked: "Do you read current dairy literature?" Twenty-five answered "Yes," and their average returns per cow was \$50.23. Twenty-five answered "No," and they averaged

only \$32.95 per cow, a difference of \$17.58 per cow. Those who read, fed their cows better. The average cost of feed per cow was \$35.15 per year, with a profit of \$15.06 per cow. Those who did not read only fed \$32.29 worth of feed per cow, and it was \$2.86 less than the others, and made a profit of less than \$1.00 per cow. It pays to read, and because they do not read is why so many so-called dairymen do not make a success. So the buttermaker must urge his patrons to read. Send a list of their names to the Experiment Station and request them to send bulletins which would be of interest to farmers and dairymen. Send to publishers of dairy papers and get a number of samples of their papers, and give them out.

We, as buttermakers and dairymen, must put our shoulders to the wheel, if we expect things to go here in Illinois. And, by the way, Illinois is forging to the front as a dairy state, according to the United States census report for 1900. Illinois had 1,007,664 cows, total value of the product of the cow, \$29,633,619, or about \$29.60 per cow. A rather small average you say? Yes, it might be better, and is today, as I will show you later.

But let us look around us. The same census gave Kansas, Nebraska and South Dakota a credit of \$20.00 per cow, or a little less. Iowa, a great dairy state, only \$19.30; Minnesota, \$28.00; Vermont, \$36.00; New York, \$37.00, and New Hampshire \$55.00. So you see we are by no means the lowest, and can only see in the future (I do not know how far) the possibilities that are before us.

But we have moved up a notch or two since 1900, and according to Dairy Commissioner Jones, Illinois has 1,700,000 cows, total value of produce about \$60,000,000, or an average of \$35.00 per cow. At this rate of increase (and I believe it is possible for a dairyman to increase the value of the product of his cow at the rate of \$1.00 per year) I say that an increase of \$1.00 per cow per year for the next twenty years would place our average where New Hampshire was in 1900, with a credit of \$55.00 per cow, and with our 1,700,000 cows this \$20.00 increase

would mean \$35,000,000 to our dairymen, and the greater part of the \$35,000,000 would be clear profit.

To show you that it is possible to make our cows bring us \$55.00 per cow in Illinois, we will again quote from the United States census report for 1900. MeHenry county cows averaged \$43.00, Cook county \$44.00, and Kane county \$50.00, and they are probably doing better by this time.

There are individual herds making 300 pounds of butter a year and over in these and other northern counties, and the average high returns per cow in these northern counties would lower our average in Southern Illinois probably to about \$29.00 per cow against an average of \$35.00 for the whole state.

Some of you would say, "Why so great a difference between the northern and southern part of the state? I would name three reasons: The cow, the man and surrounding circumstances. In the northern part of the state they have better cows than we do, for they have been breeding and building up their herds for many years. Then the man: I won't say they have better men up there than we do, for I do not believe it, but they have better dairymen. Why? Because they have had more experience in dairying. In years past, when we raised large yields of wheat and corn in Southern Illinois and were wearing out our land, the dairymen farther north were feeding and milking their cows, and coming down into Egypt to buy corn. Then we had but few creameries in Southern Illinois and but a poor market for the product of the cows. Then we heard Elgin butter quoted at 25 to 30 cents, and we could only get from 10 to 15 cents. But it was not the fault of the butter, no, not at all. The fact was in the market. The butter was all right, but the people did not like it as well as they did good creamery butter, and would not pay the price. But now things are changed. We have a good many creameries down here, and our butter sells for the same price as it does father north.

We have some good dairymen down here too. One of our patrons with nine cows received \$486.14, or an average of \$54.00

per cow from the creamery in 1905. This was cash and did not include his skim milk from 59,900 pounds of milk, nor the calves. One man with two cows received \$128.00 cash from the creamery, besides supplying a family of three with milk and butter. They never sent their Sunday milk. So you see it is quite possible to own a herd that will bring the farmer not only \$55.00 per year, but even \$75.00, counting skim milk and calf. . .

To obtain these results, the buttermaker and patron should work hand in hand. This creamery business is a mutual affair. We must not try to keep the patron in ignorance in regard to the operations of the creamery, nor the business of the creamery. If they ask you a question in regard to the business, do not turn it off or give an indirect answer, but tell them what they want to know, then when you ask them how they care for their milk some time when it is off flavor, and want information, ten chances to one he will tell you, when on the other hand if you turn him off, he may turn you down the same way.

Just last fall, a patron of a creamery asked the president if the patrons could see the returns for butter and know what was got for it, and he said they could not; they were told they were getting top prices for butter but would not show the figures, and the price he was getting for butterfat would indicate that they were not getting top prices for butter by about two cents, or something else was the matter and they dared not let them know it, or they would figure out they were not getting what they should. This way of treating patrons causes suspicion to arise in their minds and will finally be the undoing of that creamery if kept up. We must be honest with the patron if we expect him to be honest with us. We must not only tell them the truth, but the whole truth and part of the truth will not always suffice.

To illustrate this point, the manager and buttermaker of a certain creamery in Southern Illinois claimed to their patrons that they were getting more for their butter than we do at the Flora creamery, yet we pay the most for butterfat. This is

the truth but not the whole truth. The product of that creamery is sold on the New York market, and they have to pay freight and commissions and stand the loss of shrinkage, no freight and no commission, our price is net price, and theirs was not. It does no good to try to make the patron think that the creamery business is beyond his comprehension, that it is impossible for him to understand why a thing should, or should not, be done, for just as sure as you do convince him that he can not understand it, then you have convinced him that you have him at your mercy, and he will always be suspicious and often find fault.

In conclusion, I wish to say that the relation of the butter-maker and patron is such, that neither can exist without the other. Without the patron and his patronage, the buttermaker must change his calling, and without the buttermaker, the patron ceases to be a patron, and instead of changing his occupation, he just becomes a farmer, a plain, common, everyday farmer, and earns his living tilling the soil and by the sweat of his brow.

By the President:—I am sorry our time is so limited, but we will have to pass on.

We will now listen to Mr. Jansen on “History of Dairying in Effingham County.”

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#### HISTORY OF DAIRYING IN EFFINGHAM COUNTY.

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By A. F. Jansen, Effingham, Ill.

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Mr. Chairman, Farmer Friends and Dairy Associates, Ladies and Gentlemen:

In getting up the history of dairying in Effingham county, I was confronted with difficulties I did not expect to meet, therefore, if one or the other item is not exactly correct, you will kindly excuse the error.

The most important factor in the dairy business is, as you will all admit, unquestionably, the cow. Therefore, “Honor to whom honor is due,” and we will have to confer that on the



good old cow, who is man's most profitable, indispensable property of all domestic animals. Without the good old cow to help supply the food item and raise the oxen to break up the native soil, the pioneers of this country would have never ventured into the wilderness to make a permanent home for themselves and their children. So you see it was the cow that helped transform wilderness into habitable, homelike country. And now, after some seventy odd years of development, farming and crop raising, it is her again that is called to help build up, restore and replenish to a great extent the exhausted productiveness of our farm lands.

From the pioneer days up to about twenty years ago, there was not, however, much development of the dairy business for two reasons. One reason was because the people thought they did not have to, or, rather, were not aware they would eventually farm themselves out by continual crop-raising, without replacing the fertility. You see they were always taking from the soil. The other reason was, they did not want to, because it did not pay.

In the earlier days of this country there was no market or demand for dairy products as we have now. The town and cities often had as many cows as families that lived inside their corporation limits.

While domestic animals were running at large, they were very little expense during the summer months, and in winter those town cows would always be on the lookout for the farmers to come in with loads of hay or corn, or anything that came handy, even if it was bran or shorts gotten at the mills. Under those circumstances, they could have their milk supply fresh and unadulterated, and as clean as they cared to make it, at less cost than a dairyman could possibly furnish it.

However, these things gradually changed and a little custom dairying began. Besides that, a few farmers, or rather farmers' wives, made a special effort to make good, first-class butter, for which they invariably succeeded in getting a good price. My wife, at one time, had a trade established for butter for which

we received twenty cents a pound the year around, for all we could supply, but how does that compare with the prices you creamery patrons now realize for your butter?

The cows of those earlier days were as a rule, just simply cows. Natives you might call them, but nevertheless there were some excellent milkers among them.

The first improvement in that respect was made when some of the fine looking roan Shorthorns were brought to this State from Kentucky. They were known here as Kentucky Roans.

The first dairy breed that attracted any attention were the Jerseys. In some instances the ignorant were imposed upon; tried to make them believe that when milking one of those cows, you would have ready-made butter in your pail by the time you was done milking.

At one time, an overland traveler (a mover) went through here who had one of those "Chursey cows" tied behind his wagon. Alongside of the road he was traveling, one of our German friends was working in his field. He had heard of the "Chursey cows" already making so much butter, that he concluded to buy one at the first opportunity. So when he saw this little yellow cow behind the wagon, he thought that this was his chance. When the traveller was near enough, he says, "Goot morning, mine friend; how was you this morning." "Oh, thank you, very well," says the other, who happened to be an Irishman, "and how are ye?" "Oh, I was allright, I guess," he says, "but vat kind of cow is dat behind your wagon?" "That is the best little Jersey cow that iver walked on four feet," says the Irishman. "Das is all humbug," says the other, "an animal vat does not walk on four feets, never was a cow at all. But is dat one of dem real Chursey cows vat makes so much butter?" "Yes sir," says the other, that is a full seven-eighths Jersey cow, begoora." "And vat is de odder eighth," asked the German. "Why, I suppose just simply cow," said the Irishman. "O, I tinks maybe it was Gegerorra Goat," says the German, "but anyhow, vat you sell dat cow for?" "Oh, well," says the other,

“that cow is worth fifty dollars between brothers.” “Das may be abernicht between strangers,” replied the first. “Das is too big money for so little cow.”

The first attempt to make butter for market, outside of what was made by the farmers at home, was commenced here in Effingham in the year 1889 by a creamery which was run on a cream gathering system. The proprietor was a man by the name of Stempel. He commenced operations some time in April, and closed and left again in the fall of the same year.

The next creamery to open was at Shumway, about eight miles northwest of here, on the Wabash road. It started in October, 1889, and was run until 1895, when it had to close on account of not getting enough milk—they varied from 2,500 to 4,500 pounds per day—and too low prices for the butter. They paid as low as forty cents per 100 pounds for milk.

The first co-operative creamery was established in Montrose, nine miles east of here, on the Vandalia railroad. It opened up in 1890, and received the first day about 500 lbs. of milk, and the highest it reached was about 4,000 pounds. After running a few years, it was also forced to close, for several reasons. One of those reasons was that it, the same as Shumway creamery, did not receive enough milk, and another reason was possibly a little mismanagement, but the most important reason was, the low price of butter.

Now right here, my farmer friends and creamery patrons and shareholders, I wish to call your attention to some facts which maybe you are not aware of. One is, what you owe to the State Dairy Association of this and other States, for insisting and forcing our representatives in congress and the senate to pass laws to restrict the sale and manufacture of oleomargarine.

I will read an extract from the Creamery Patrons Hand Book, proving the effect those laws have had in bringing better prices for good creamery butter.

“Farmers who sell milk to the creamery and receive pay therefor upon basis of the market price of butter, little realize

the losses which they have incurred as a result of the manufacture and sale of a mixture of lard, tallow and cottonseed oil, known as oleomargarine, but until July 1 of this year almost universally sold or served as butter, because of the fact that it was colored in exact imitation thereof.

In 1886 this traffic amounted to 21,513,537 pounds; in 1894 it had grown to 69,622,246 pounds; in 1900 to 107,045,023 pounds, and during the last fiscal year was 123,180,075 pounds, equal to 2,463,615 fifty-pound tubs, over six thousand car-loads, or as much oleomargarine as one thousand large creameries turn out butter. *In other words, twenty-seven oleomargarine factories turned out oleomargarine equal in quantity to 25 per cent. of the butter product of all the creameries in the United States.*

The National Dairy Union was organized for the purpose of fighting this fraud.

In December, 1898, the proposition to ask congress to place a tax of 10 cents per pound upon oleomargarine, colored in imitation of butter, was laid before the dairymen of the country by this organization. The work was immediately taken up, and, after more than three years of constant effort, the measure was finally passed. Every buttermaker or creamery manager knows what the results have been.

Those most benefitted by the work of the National Dairy Union are the milkers of cows. Every cent added to the value of butter is a cent directly in their pockets. The merchant makes as much on butter sold at 15 cents as he does on that sold at 25 cents, and the former price requires less capital to handle; the creamery company is benefitted only to the extent of its increased output of butter, which results from driving a fraudulent competitor out of the market. It is the farmer who gets nine-tenths of any advance in price of butter."

The next creamery established was at Sigel, eight miles north of here, on the Illinois Central. Although being just over the line in Shelby county, it is somewhat connected with Effingham county in a business way, at any rate with the creamery

because it had quite a few patrons from this county. It commenced to operate August 7, 1899, with forty patrons and 1615 pounds of milk. It was the first creamery that was operated successfully in this part of the country, having paid as high as 40 per cent dividend one year to its shareholders. It received as high as some over 22,000 pounds of milk in one day.

The next co-operative creamery established was right here in Effingham. It opened up to receive milk April 21, 1900. It paid out to patrons for the first full month of May, \$587.97; June, \$597.63; June, 1901, \$996.65; June, 1902, \$1,274.02; June, 1903, \$1,377.15. It paid a fair dividend to its shareholders for two years. It, however, closed its doors July 15th, 1904, on account of the condenser paying better prices for milk than any creamery could afford to pay for milk of the average test, 4 per cent butterfat. However, I hope it will open up again some day when this part of the country will be developed enough in the dairy business to produce milk enough to supply both plants satisfactorily, and those that prefer the creamery business will have the cows that will be the most profitable for the creamery business.

The condenser before alluded to was built in 1902, after a long, persistent effort on the part of the citizens of Effingham to have a milk condensing factory located here. My farmer, as well as city friends, all remember the grand, jolly time we had going to Greenville and Highland viewing those factories and the dairy conditions around there, and especially remember coming home more than going there. Well, those hopes and expectations failed to verify, but as before mentioned, we later on succeeded in getting a first-class, latest, up-to-date milk condensing factory located here.

It opened up to receive milk February 3d, 1903, with 2936 pounds of milk. It kept on increasing from month to month, until in a year's time, on the first of February, 1904, it received 15,239 pounds. Excepting the following month, when it was a little less, it has kept steadily increasing until on August 9th of



the same year they received 42,554 pounds, and on June 10th they paid out for milk alone \$115,361.

The next co-operative creamery, after the one built here in Effingham, was in the neighboring town of Tutopolis, three and a half miles east of here on the Vandalia line. It opened up on the 18th of August, 1901, with 55 patrons and about 3500 pounds of milk. It has at present about 130 patrons. The highest amount of milk received in any one day was about 12,000 pounds. It has been fairly successful. They at one time shipped milk to St. Louis, but after a few shipments, made butter again exclusively.

The next successful creamery opened up at Dietrich, about twelve miles southeast of here, on a branch of the Illinois Central, near the east side of this county. It began to do business on the 15th of September, 1902, with 46 patrons. The first year that creamery made 56,137 pounds of butter. The largest amount of milk received in one day was 15,500 pounds, on June 12th, 1905. That creamery has made, since it commenced operations, 213,103 pounds of butter.

Besides those creameries mentioned, there is one doing business in Beecher City, on the extreme west side of the county. There is also one in the southern part of the county, at Welton. It opened May 17th, 1904, with thirty-two patrons and about 1,700 pounds of milk. The highest amount received in one day was 5,000 pounds.

Last spring some time, a cheese factory opened up at Edgewood, on the edge of the south county line.

This is in brief the history of dairying in Effingham county up to the present day. If anything is omitted, I assure you it is not intentional, but because I have failed to get the correct reports from the different places.

Ladies and gentlemen I thank you for your kind attention.  
By the President:—Any remarks?

Mr. Mason:—I don't see where they have these splendid

markets that they don't produce more milk. Six cans the highest dairy here?

A:—I can't account for it.

Q:—You get the same price here that we do for milk and our land is twice the price of yours. There isn't a better opportunity than you've got right here.

A:—I assure you I should like to see the change. It dropped out some last fall on account of the condensing factory insisting on running on a contract system, which a great number of the farmers opposed. They would not bind themselves.

Q:—How do you mean?

A:—Sign a contract to deliver so much milk and so on, care of the cow barns, etc. Everything the contract contained was done for the farmers own benefit. I hope this thing will revive. I know a good many farmers, friends of mine, are sorry now that they did not sign the contract. He doesn't hear that jingle in his pocket now.

A Member:—Any experience in skimming stations. Any one running a skimming station to a creamery?

A:—There are some in the audience more experienced on that question than I am. As much as I know there is none.

Q:—Not one here in the county, but all over the state?

A:—As far as I know there is none around here.

Mr. Spies:—Skimming station, you mean?

A:—Not farm separator, but build up skimming stations to hold the cream to take to the creamery afterwards.

A:—Mr. Lee could answer that question.

Mr. Newman:—It is simply run just as you run your central plant, without the churn.

Q:—No, I mean to be a benefit to the creamery.

A:—Why it is simply located a distance convenient to collect the cream. You skim the milk that you have on your wagon, and take that cream from this skimming station to the plant.

Q:—In what shape should you start them?

A:—

&:—He means financially.

Q:—Yet, a man wants to put in a skimming station. Can we afford to do it so as to be a benefit to the patron. They haven't done it around here. How about putting in a skimming station. You have to pay for extra help to run it and haul the cream to the factory.

Mr. Newman:—No sir, it is not essential that the man who runs the skimming station should be of that high grade as the man at the central plant. He must test milk correctly and then he will run the separator properly to get the results.

Q:—Can we afford to run it on that three cents over?

Mr. Spies:—The time is getting short. If the gentleman wish any more information on that subject, there are several men from Northern Illinois who will be pleased to give him all the information he wants.

Adjourned until Wednesday afternoon, 1:30 p. m.

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By the President:—We will now listen to some music by the orchestra.

Encored.

The next on the program is a talk by Hon. A. H. Jones, state food commissioner. I have just received a letter from him. In it he says he will be present tomorrow afternoon to address the State Dairymen's Association. He could not come today as he had some matters that detained him, but will be here tomorrow afternoon. We will have to save his talk until tomorrow afternoon.

We will now listen to Prof. Fraser, who is Chief of Dairy Husbandry at Champaign, who will tell us of the "Difference of Efficiency of Individual Dairy Cows," with the aid of stereopticon views.

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**ADDRESS.**

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By Prof. Fraser, Urbana, Ill.

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It is considered as axiomatic that the practices of any locality are approximately correct for that region. This, however, is not always the case, for man is by nature a great imitator and it seems natural for him to adopt such practices as he sees his neighbor pursuing. A striking example of this in dairy affairs is found in the little country of Holland, which is only about one-fourth the size of the State of Illinois. In the province of North Holland, which has an area slightly larger than one of our counties, the house and stable on each farm are built under one roof, while in the province of Friesland, only a few miles distant, the house and stable are always separate buildings connected by a covered passage. No reason can be given for this difference in construction, as both provinces are intensive dairy districts, and the climatic conditions, the kind of cows, and the purpose for which they are kept, are practically the same in both provinces.

In our own country people travel about so freely that we have no such striking example as this in so short a distance, but the same thing exists nevertheless. In the dairy region in the northern section of this state the majority of dairy barns are equipped with low mangers and rigid stanchions, while in the dairy region of southern Illinois practically all dairy barns have high mangers and the cows are tied with chains or ropes. There can be no possible reason for fastening cows differently and having the mangers of such different shapes in the two sections of the state. These examples simply show how prone we are to follow the customs of the community in which we live, adopting their methods and following them for years, apparently without a thought as to whether or not there is a better way.

This does not seem to be a wise policy when dealing with such a delicate animal as a fine dairy cow. Her food and care should be given most thoughtful attention and she should by all

means be kept as long as she is profitable, because of the great difficulty with which a good producer is obtained..

Three essentials to successful milk production are:

1. An excellent individual obtained by good breeding.
2. Feed of the proper kind and quality, supplied in a well balanced ration.
3. Care of the animal.

This paper is devoted exclusively to the third essential. If the first two requisites are present in the highest degree and the last is not supplied, the efficiency that should be gained from a good individual, well fed, is largely lost. For this reason the care of the animal is of great importance. A cow that is a good producer does a large amount of work, and since the milk is secreted from the blood and is such a delicate product, the cow must be properly cared for that the milk shall be in the best possible condition. To obtain such milk the cow must have an abundance of fresh air and light, as much comfort as possible, and a reasonable amount of exercise, not alone for humane reasons, but that she may produce the most that she as an individual is capable of on the food supplied, as this will mean more dollars and cents in the owner's pocket.

It is a well known fact that cows cannot endure as much exposure as steers and this has given rise to the too common practice of keeping dairy cows shut up in a tightly closed stable, cramped on a platform, and crowded among other cows with their heads fast in rigid stanchions for nearly twenty-four hours in the day for six or eight months in the year, usually with no system of ventilation and with very little light, yet the majority of cows in Illinois are kept in this manner.

The existing state of affairs led to an investigation concerning the best method of keeping dairy cows, and the question this paper wishes to raise is: Are we caring for our cows in the best manner possible, and if not, how can present methods be improved?

Keeping cows properly in a stable, involves much labor, as



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each cow must be handled and treated individually. Since the few dairymen who were known to be allowing their cows the freedom of a closed shed or covered barnyard, using the stable for milking only, were so well pleased with the system, an effort has been made to get the views of as many dairymen as possible who have had experience in keeping cows in this manner. Accordingly a set of questions was sent to all whose addresses could be obtained. These questions and the answers are given in Table 1.

Table 1. Answers to Questions by Men Who Had Experience in Keeping Cows Loose in a Shed.

| Farm Number.                  | 1            | 2           | 3              | 4            | 5             | 6             |
|-------------------------------|--------------|-------------|----------------|--------------|---------------|---------------|
| Years practiced .....         | 8            | 2           | 4              | 6            | 9             | 24            |
| Number cows kept .....        | 13           | 14          | 18             | 20           | 20            | Mixed         |
| Breed .....                   | Short-horn   | Jersey      | Short-horn     | Mixed        | Jersey        | Yes           |
| Are all cows dehorned.....    | Yes          | No          | Yes            | Yes          | Yes           | Yes           |
| Is dehorning necessary.....   | Yes          | No          | Yes            | Yes          | Yes           | Yes           |
| Do cows injure each other     | No           | No          | No             | One case     | no            | No            |
| more than when stabled..      | 13x40        | 24x24       | 32x70          | 3 sec. 16x24 | 66x80         | 45x60         |
| Size of shed .....            | 40           | 41          | 124            | 48           | 264           | 112           |
| Sq. ft. per cow .....         |              |             |                |              |               |               |
| Sq. ft. needed per cow.....   | 65           | 40—50       | 80             | 48           | 200           | 112           |
| How often is shed bedded..    | Once a day   | Once a week | Twice in 3 da. | Once a day.  | Once a day    | Once a day.   |
| Is more bedding required      |              | Same        | Yes            | Much more    | Yes           | Yes           |
| than in stabling .....        |              |             | When           | Every 2 wks. | Twice a yr.   | Twice a yr.   |
| How often is manure hauled    | Once a week  | Once a year | convenient     |              |               |               |
| What is fed in milking stable | *            | Grain, hay  | Grain          | All feed     | Roughage      | Grain, silage |
| What is fed in shed .....     | Roughage     | Hay         | Roughage       | Nothing      | Grain, silage | Hay           |
| What provision for ventila-   | Doors        | Doors       | Doors,         | King system  | Windows       | Windows       |
| tion .....                    | Windows      |             | Windows        |              |               |               |
| Can cows be kept sufficiently | Yes          | Yes         | Yes            | Yes          | Yes           | Yes           |
| warm in cold weather....      |              |             |                |              |               |               |
| Does milking stable hold all  | Milk in shed | Yes         | No             | Yes          | Yes           | Yes           |
| cows .....                    |              |             |                |              |               |               |
| Do cows keep cleaner than     | Yes          | Yes         | Yes            | Yes          | Yes           | Yes           |
| if stabled .....              |              |             |                |              |               |               |
| Is milking stable more san-   | —            | Yes         | Yes            | Yes          | Yes           | Yes           |
| tary .....                    |              |             |                |              |               |               |
| Will cleaner milk be pro-     | Yes          | Yes         | Yes            | Yes          | Yes           | Yes           |
| duced by this method .....    |              |             |                | Depends on   | man           | If bedding is |
|                               |              |             |                |              |               | abundant      |

\*Grain fed while milking.

Table 1.—Continued.

| Farm Number.   | 7                        | 8                    | 9                         | 10                           | 11                   | 12                           |
|--|--------------------------|----------------------|---------------------------|------------------------------|----------------------|------------------------------|
| Years practiced .....                                      | 1                        | 4                    | 11                        | 5                            | 1                    | 4                            |
| Number cows kept .....                                     | 25                       | 25-30                | 30                        | 30                           | 33                   | 36                           |
| Breed .....  | Mixed                    | Mixed                | Jersey                    | Red Poll                     | Jersey               | Jersey                       |
| Are all cows dehorned .....                                | Yes                      | Two-thirds           | Yes                       | Poll                         | Yes                  | Yes                          |
| Is dehorning necessary .....                               |                          |                      |                           |                              |                      |                              |
| Do cows injure each other<br>Do more than when stabled..   | Yes                      | Yes                  | Yes                       | Yes                          | Yes                  | Yes                          |
| Size of shed .....   | No                       | No                   | No                        | No                           | No                   | No                           |
| Sq. ft. per cow .....                                      | 100x40                   | 45x72                | 14x110                    | 64x64                        | 35x52                | 60x78                        |
|  | 160                      | 120                  | 51                        | 130                          | 55                   | 130                          |
| Sq. ft. needed per cow .....                               | 80                       | 120                  | 35                        | 130                          | 60                   | 130                          |
| How often is shed bedded..                                 | Every 2d day             | Once in 2 wks        | Every 2d day              | 3 times a wk.                | Every day            | 3 times a wk.                |
| Is more bedding required<br>than in stabling .....         | Yes                      | Yes                  | Yes                       | Yes                          | Yes                  | Same                         |
| How often is manure hauled                                 | Once in 2 mo.            | Once in 3 mo.        | 3 times a yr.             | Odd times                    | 3 times a yr.        | Almost daily                 |
| What is fed in milking stable<br>What is fed in shed.....  | Grain<br>Silage, alfalfa | Grain<br>Silage, hay | Grain, silage<br>Roughage | Grain, Silage<br>Fodder, hay | Grain<br>Stover, hay | Grain, silage<br>Fodder, hay |
| What provision for ventila-<br>tion .....                  | None                     | Windows              | Windows,<br>doors         | Windows                      | Hay chute            | Windows                      |
| Can cows be kept sufficiently<br>warm in cold weather..... | Yes                      | Yes                  | Yes                       | Scarcely                     | Yes                  | Yes                          |
| Does milking stable hold all<br>cows .....                 | Half                     | Yes                  | Half                      | Yes                          | Holds 3              | Yes                          |
| Do cows keep cleaner than<br>if stabled .....              | Yes                      | Yes                  | Yes                       | Yes                          | Yes                  | Yes                          |
| Is milking stable more sani-<br>tary .....                 | Yes                      | Yes                  | Yes                       | Yes                          | Yes                  | Yes                          |
| Will cleaner milk be pro-<br>duced by this method.....     | Yes                      | Yes                  | Yes                       | Yes                          | Yes                  | Yes                          |

Table 1.—Continued.

| Farm Number.   | 13             | 14            | 15           | 16             | 17         | 18            |
|--|----------------|---------------|--------------|----------------|------------|---------------|
| Years practiced .....                                      |                |               |              |                |            |               |
| Number cows kept.....                                      | 2<br>40        | 5<br>40       | 6<br>35-75   | 9<br>65        | 150        | 4<br>130      |
| Breed .....  | Holstein       | Mixed         | Jersey       | Holstein       | Jersey     | Jersey        |
| Are all cows dehorned.....                                 | Yes            | Yes           | Yes          | Yes            | Yes        | Nearly all    |
| Is dehorning necessary.....                                | Yes            | Yes           | Yes          | Yes            | Yes        | Preferable    |
| Do cows injure each other<br>more than when stabled....    | No             | No            | No           | No             | No         | No            |
| Size of shed .....   | 48x50          | 40x50         | 100x84       | 32x140         | 3-75 diam. | 143x225       |
| Sq. ft. per cow.....                                       | 60             | 50            | 112-240      | 69             | 35         | 250           |
| Sq. ft. needed per cow.....                                | 75             | 60            | Twice a week | 35             | _____      | 215x250       |
| How often is shed bedded....                               | Once a day     | 3 times a wk. | _____        | Once a day     | _____      | 3 times a wk. |
| Is more bedding required<br>than in stabling.....          | About same     | About same    | Yes          | Yes            | _____      | No            |
| How often is manure hauled                                 | Once a week    | 3 times a yr. | Spring, fall | When 18 in. di | _____      | Once in 6 wks |
| What is fed in milking stable                              | Hay, silage    | Grain, silage | Grain        | _____          | Grain      | Grain         |
| What is fed in shed.....                                   | Corn stover    | Cracks        | Hay, stover  | _____          | Roughage   | Roughage      |
| What provision for ventila-<br>tion .....                  | Windows        | Cracks        | Windows      | Ventilators    | _____      | Doors         |
| Can cows be kept sufficiently<br>warm in cold weather..... | Keep in stable | Yes           | Yes          | Yes            | Yes        | Yes           |
| Does milking stable hold all<br>cows.....                  | Yes            | Yes           | Holds 45     | Milk in pens   | Holds 40   | Yes           |
| Do cows keep cleaner than<br>if stabled .....              | Yes            | Yes           | Yes          | Yes            | _____      | Yes           |
| Is milking stable more sani-<br>tary .....                 | Yes            | Yes           | Yes          | Yes            | Yes        | Yes           |
| Will cleaner milk be pro-<br>duced by this method.....     | Yes            | Yes           | Yes          | Yes            | Yes        | Yes           |

As the answers to the last question, "What do you consider are the chief advantages of keeping dairy cows in this way over the ordinary stabling?" could not be sufficiently condensed for the table, and as these answers are by far the most important, they are given in full below.

\*1. "It saves labor cleaning stables and in feeding roughness, cows are kept more comfortable and as more bedding is required a greater amount of manure is made which is preserved in better shape."

2. "Cheaper, as it saves labor, cleaner, and the cows are more healthy."

3. "Saves labor in handling manure, in bedding stock, and in feeding roughage. The stock have access to water at all times and are kept much more comfortable."

4. "A larger amount of manure is made and preserved in better condition. By containing much straw all liquid manure is absorbed and when applied to the land, humus is added to very great advantage. The system is good only where straw is abundant that can be so utilized. If the straw is limited in amount the system would be a filthy one and if the herdsman is negligent or careless the cows will become more or less filthy. With a careful man and reasonable attention the system works exceedingly well. We are so well pleased with it that we have no thought of making a change."

5. "This method saves a great deal of labor, as it is more convenient and there is little stable cleaning to be done. The cows are free, comfortable, and more healthy, giving the owner greater profit."

6. "Saves labor in keeping stable clean."

7. "The greatest advantage is the saving of labor. One man can handle forty cows except milking. Cows are more healthy and contented. Manure is worth more, as all the liquid is absorbed by the bedding and the whole is thoroughly mixed together. The manure has to be handled but once and that may



be done at any time most convenient and when no injury is done the land by tramping."

8. "From my point of view and experience the chief advantages are: freedom and ease for the cow in getting up and lying down without having to do so in cramped quarters, the saving of labor in bedding and cleaning stables, besides avoiding the necessity of hitching up and hauling out the manure every day. We have a large watering tank which is fed by an underground pipe from the windmill pump. The tank is incased on the sides and ends with sawdust space and a cover is used in very cold weather when the windmill is not running, which keeps the water from freezing. I have seen cows go to the tank at nine or ten o'clock at night and drink heartily and then lie down. This will be done more frequently than we have any idea unless we watch. It is this freedom to supply any want, with comfort and kindly handling that increases the production, and I think, makes better milk.

We have a lot adjoining the shed where the cows are allowed to pass out as they wish in pleasant weather to enjoy a sun bath for a few hours. We use the same lot for the cows at night in summer, where they may lie and enjoy the cooler air, or if they wish they can crop a little grass in the pasture adjoining.

I know of no way we can save so much manure. Straw with us is abundant and can be used in this way to add to the comfort of our live stock as well as the fertility and better condition of the soil. I venture to predict that the time will come when many of our best farmers will care for their cattle in closed sheds."

9. "I consider the chief advantages to be: the sanitary condition of the milking stable, the saving of labor in the more economical handling of manure and feeding of roughage, and, most important, the health of the herd."

10. "The advantages of this system are that it saves labor in watering stock and in stable cleaning; the manure can be hauled out at any time or it can be left until needed without

waste. The shed is a good place to feed fodder corn or shief oats, as the pigs get the shatterings and the refuse may be used for bedding. What long stalks are thrown out of racks have never been noticed in the manure. A water tank with good float valve affords the cows access to water at all times, and the shed is a good place for the cows during the first cold rains in fall."

11. "By this method we have cleaner cows and increased milk flow; we save labor in cleaning stables, and in hauling out manure; and the fertility in the manure is preserved more completely."

12. "I consider the chief advantages to be the comfort and cleanliness of the herd and the saving of labor."

14. "In any case the closed shed most assuredly saves labor, for the cows do not require so much grooming and there is less work in handling manure. The cows are certainly more comfortable in the shed and what favors the health and comfort of the cows favors the production of milk. I believe that I had two cases of abortion caused by keeping the cows too much in the stanchions."

15. "The advantages are saving of labor in cleaning stables, bedding cows and feeding roughage; cleanliness; allowing cows more exercise, and preserving the manure in much better condition."

16. "This method saves a great deal of labor in feeding and in stable cleaning and the cows are more at their ease. The same cows in a pen soon become used to each other and never make trouble after being handled in this way for a little time, each one almost invariably stands in the same place while eating. When cows are kept in this way the value of the manure is nearly double, as the liquid is saved and no leaching takes place."

17. "Our cattle are cleaner than any herd of stalled cattle I ever saw. A soiled cow is a rare sight in our herd. By this method we have increased milk yield and greater healthfulness; have not had a case of milk fever since our dairy started. We consider the system a success."

18. "The advantages are, cleanliness, health of the herd, and saving of labor."

On farm No. 1 a portion of the barn,  $10\frac{3}{4} \times 40$  feet, not including the manger, is devoted to the cows; there they are allowed to run loose and eat their roughage from a manger which extends along the feeding alley.

The most interesting feature in connection with the keeping of this herd, is the way in which the milking is done. The cows are all milked by one man and when milking time arrives the grain feed for the first cow is placed in the box at the north end of the manger. Cow No. 1 is always on hand to take her place and since she stands next the wall and the milker sits on the side toward the rest of the herd she is not disturbed by the other cows while eating her grain and being milked. As soon as the milk is drawn it is weighed and poured into the strainer. While this is being done cow No. 1 moves away among the rest of the herd and No. 2 comes up for her grain, which is placed in the feed box. As the cows are not tied no time is lost in changing. It is surprising to see how quickly they learn to take their places and in the same order. This is very important to the success of this method, as it makes the milking time come regularly for each cow.

As all cows should be fed liberally on roughage and the grain feed varied according to the milk flow and the individual needs of each cow, this method works admirably in all respects, and it has been successfully practiced on this farm for eight years. This method is economical of room since no milking stable is required and as there is no partition for the milking stall all of the room is available for the cows between milkings. It is somewhat more sanitary to have a separate milking stable, yet if sufficient bedding is used, both cows and stable are cleaner than are usually found where ordinary stabling is practiced. Since this method works so well with a small herd and one milker there is no reason why the same could not be practiced with a large herd by dividing it into sections and having all the cows milked

by one man, in a portion by themselves. By dividing a large herd into sections there is also the advantage of keeping the boss and stronger cows separated from the more timid or weaker ones.

The manure is removed and applied to the land with the manure spreader when convenient and when the land is in suitable condition to receive it.

On farm No. 11 a space in the barn 35x52 feet is devoted to the cows. A manger running lengthwise extends to within eight feet of the wall at each end. These spaces between the manger and the wall are closed by gates. At milking time all of the cows are driven to the side of the manger on which the water tank is situated, and the gates are closed. The door of the milking room is then opened and the boss cows are always ready to enter. Near the end of this room are three stalls in which the milking is done, and it is surprising to note how quickly each cow learns in which stall she is to be milked and the order in which her turn comes so that the three milkers have little difficulty in always milking the same cows and in the same order. When the milkers are ready the gates at the rear of the stalls are opened, one cow enters each stall and the gates are closed. The cows eat their grain while being milked and pass out through the gates at the front of the stalls into the other side of the shed. As the manger and gates divide the shed, the cows that have been milked are forced to remain on one side and cannot come to the milking stalls a second time.

All grain is fed in the milking stalls and the roughage from the large manger in the center of the shed. This manger is raised as fast as the manure accumulates so that it is always a convenient height for the cows. In this herd of 33 cows not a soiled cow was to be seen.

The plan of allowing dairy cows to run loose in a shed, looked so reasonable, and those dairymen who had tried it reported so favorably concerning the results obtained, that it was decided to put the method into actual operation with a portion of the university dairy herd in the fall of 1903. Accordingly a shed

30x68 feet, adjacent to the dairy barn, was arranged for this purpose; mangers were built on each side, and the two bull pens were retained at the corners. From Cuts 19 and 20 it will be noticed that this shed is a one-story building with windows and doors on both sides, thus affording excellent ventilation. Twenty-two cows have been cared for in this manner with most satisfactory results.

From the experience at the university the past two years it has been found that the cows keep much cleaner than when stabled and that the milking stable is in a more sanitary condition, consequently it is easier to produce clean milk. By this method there is less difficulty in providing cows with an abundance of fresh air and they are more vigorous and healthy and have better appetites than when kept in the stable. Since they can move about and get exercise they will not suffer in cold weather if the temperature is somewhat lower than in the ordinary stable. Labor is saved as the shed can be bedded much more easily and quickly than can stalls; there is little stable cleaning to be done and the manure is hauled directly from the shed to the field at any time most convenient and when least damage is done the land by tramping. Another advantage is the saving of fertility much more completely. Many barns do not have cement floors and so there is more or less waste of the liquid portion of the manure. Since land is becoming so high priced no farmer can afford to allow any fertility to be wasted and by this method all the liquid is saved, as it is absorbed by the bedding. If only enough bedding is used to keep the cows clean they tramp the manure so thoroughly that it does not heat to make the air impure. If manure is hauled directly from the stable to the field there is a considerable portion of the year when it must be allowed to accumulate in the yard where it will leach badly, or it must be hauled on to the land when it is so wet and soft that much injury is done by tramping; this is especially true on clay soil.

On many dairy farms the question of getting sufficient help is becoming such a problem as to interfere seriously with this



branch of agriculture. As it seems to be the opinion of the majority of people who have practiced this method, that it saves labor, this is one of the strong points in its favor.

The information at hand is not sufficient from which to draw definite conclusions for all sections of the country and all conditions. A tentative report is now published as this system has been a marked success wherever we can find that it has been



tried, and it seems probably that it could be put into practice by many dairymen of the state greatly to their advantage and to the general improvement of the milk supply.

We are especially desirous of communicating with all who have had experience in keeping dairy cows in this manner and any one knowing of such persons will confer a great favor upon the Department of Dairy Husbandry of the University of Illinois by sending the names and addresses.

All suggestions and criticisms concerning this method of

keeping cows, whether favorable or otherwise, are also earnestly solicited from every one who will kindly take the trouble to give them.

#### DISCUSSION.

Q:—Can a cow keep clean?

A:—If properly bedded.

Q:—How much bedding would it take?

A:—A little more than in ordinary stabling, but not much.

Q:—Don't you think that different animals of a herd require different feed?

A:—Yes sir.

Q:—How do you feed that way?

A:—Mr. Gillette's cows are fed the silage and grain in the milking stable, nothing but the coarse roughage in this barnyard. In the milking stable twice a day they feed hay, the amount they will consume.

Q:—Wouldn't you object to that horse barn in that cow barn?

A:—Yes, it is not a wise plan to keep horses with cows.

Q:—What's the objection to keeping horses with cows?

A:—More difficult to keep it sanitary, and they don't eat as well.

Q:—Is that all the fresh air the cow gets from under that shed, the out door air?

A:—They are put out doors whenever the weather is nice; they turn them out then.

Q:—In stormy weather you don't give them any more fresh air than what's in that shed?

A:—They have windows. It is one of the best illustrations. Half of the surface, half of the space is windows, about three high and eighteen windows around the barn. They give them a good amount of fresh air, and the cows moving around this way they don't mind the cold as much. A man must use his judgment.

Q:—There is bound to be bad odors, more so than in the open air.

A:—Certainly, more than in the open air, but not so much as in an ordinary cow stable, where the windows are open as much as here.

Mr. Gillette:—Wouldn't that get the germs in their food?

A:—Yes, they might, that is one small objection.

Q:—Would you recommend this scheme of keeping cattle to a well ventilated barn; this stuff will lay there all winter long. It would be fully as sanitary in a well kept barn?

A:—It depends upon the amount of bedding used. The air is as sweet in those places.

Q:—Is this barn cement or dirt floor?

A:—In some cases cement, but that is not necessary if well bedded.

Q:—Does he just let the cow eat grain while she is milking?

A:—Yes sir, just grain.

Q:—Well then, if he only gets little milk, she only gets little grain?

A:—That's about the way you want it, isn't it.

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## Wednesday Afternoon, January 17, 1906

Mr. Spies, Vice President, in the chair.

Meeting called to order.

By the Chairman:—We have such a fill of good things before us this afternoon that we will begin although the president has been detained on account of a big dinner.

We are to hear of the different breeds this afternoon and Mr. Campbell, of Genoa, will tell us about the Holsteins.

THE DAIRY BREEDS.

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SOME POINTS ON HOLSTEIN-FRIESIAN CATTLE

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By M. S. Campbell, Genoa, Ill.

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Mr. President, Ladies and Gentlemen:

In coming before you to advocate the merits of the Holstein-Friesian cow, I would not wish to be understood as asserting that the Holstein-Friesian breed contained all the good cows, nor that the other dairy breeds had possession of all the poor ones; but I can assure you that in the Holstein-Friesian breed the proportion of poor to good cows is very small.

It is my experience in the dairy business, that the dairyman himself is the main factor, and the man who is stuck on his job, puts heart and soul into it and really loves the business in itself, will make a greater success with the common cattle of the country than will the careless, slovenly man, even if he start with the best pure-bred cattle on earth—the grand Holstein-Friesian breed.

Most of our dairymen keep cattle both for pleasure and profit; though we may be sure that there is very little pleasure where the profit is wanting. Men take greater pride in a pure bred animal than in a mongrel, be it a dog or a horse, hence, are able to get more pleasure out of its possession. If then, the largest profits possible to be got out of the dairy business can be combined with the pleasure to be derived from the possession of pure-bred or high grade stock, would it not be to the interest of all dairymen, who have not done so already, to grade up their herds, and for the more earnest among them to make trial of pure bred stock?

Holstein-Friesian breeders claim that the Holstein-Friesian cow being large, strong and vigorous, naturally abounds in vitality; that she yields large quantities of the best milk, suitable to all purposes for which milk is used; that having a vigorous



appetite and being in no wise dainty, she is specially fitted for converting the roughage of the farm into salable products; that she reproduces herself in her calves, they being also large, strong, vigorous, and when by reason of age or accident her day in the dairy has reached its end, she fattens readily and makes excellent beef.

That the Holstein-Friesian cow is large, strong and vigorous is self-evident, and her hardiness is such as to best fit her for average farm use. The dairy cow is simply a living machine for the conversion of certain products of the farm into other products of supposedly greater value. In buying a machine, we do not lose sight of its capacity for work, neither should we lose sight of the capacity in the dairy cow. By capacity in the cow, we mean her digestive and assimilative capacity, and cows that excel in this must have large stomachs and vigorous appetites. The Holstein-Freisans are such cows. As a producer of good milk, no other breed can approach the Holstein-Friesian as to quantity. Many yearly records might be quoted, but I will mention two that have been authenticated beyond a doubt—those of Pietertje 2nd and Belle Sarcastic.

Pietertje 2nd produced in one year 30,313 pounds of milk was tested but once, I think, and then tested 3.16 per cent fat. and Belle Sarcastic 23,189 pounds. The milk of Pietertje 2nd Every milking that Belle Sarcastic gave was sampled and tested for fat, and the total fat for the year was 712.681 pounds. This cow was owned by the Michigan Agricultural College, and Professor C. D. Smith has stated that she was the most economical produced of butter fat that he had ever seen. If her milk had been sold at \$1.00 per 100 pounds, it would have brought \$231.90, and if it had been retailed at 4 cents a quart it would have brought \$441.72. Of course these cows were large cows; no small cows could do any such amount of work.

Many thousands of seven-day records have been made by cows of the Holstein-Friesian breed, under the supervision of the different State Agricultural Colleges and Experiment Stations



—records that are universally admitted as beyond reasonable doubt; while a few records of from one to six months have been made.

We do not claim that the short seven-day record is a measure of the capacity of the cow for the year, and that the whole year should be computed at the same rate; but we do claim that those short records furnish a very strong indication of what a cow can do under favorable circumstances, and I have never known of a really good yearly record without a good send off at the start.

These records show that the Holstein-Friesian cow is at the front in the production of butterfat. To show what it is really possible for a Holstein-Friesian cow to do, I will mention the ten best official seven-day records:

|                                  | Milk.<br>Lbs. | Fat<br>Lbs. | Butter.<br>Lbs. |
|----------------------------------|---------------|-------------|-----------------|
| Aggie Cornucopia Pauline .....   | 659.2         | 27.459      | 34.33           |
| Sadie Vale Concordia .....       | 694.4         | 24.508      | 30.64           |
| Mercedes Julip's Pietertje ..... | 584.0         | 23.487      | 29.36           |
| May Hartog Pauline DeKol.....    | 633.2         | 23.417      | 29.27           |
| Pontiac Lunde Hengerveld .....   | 559.3         | 22.730      | 28.41           |
| Lilith Pauline DeKol.....        | 653.4         | 22.589      | 28.24           |
| Segis Inka .....                 | 578.2         | 22.430      | 28.04           |
| Beryl Wayne .....                | 608.1         | 22.298      | 27.87           |
| Ianthe Jewel Mechthilde .....    | 503.0         | 22.117      | 27.65           |
| Mercena 2nd .....                | 544.1         | 22.108      | 27.64           |

These ten cows gave 6,017.3 pounds of milk, containing 233.143 pounds of butter fat, showing an average of 3.87 per cent fat. The average per cow was 601.7 pounds of milk, containing 23.314 pounds of butter fat, which is equal to 85.9 pounds of milk and 3 1-3 pounds of butter fat per day.

The opponents of our breed, while now admitting that the fat may be in the milk, have in the past asserted that we could not get it out, and that there were large losses in the skim milk. When the old system of shallow setting in pans was practiced, this criticism partially held good, but with the introduction of deep, cold setting we got nearly all, and with the present centrifugal system of skimming, every one knows that the separator

will skim the milk of one breed of cows just as clean as it will that of any other. So that old objection counts as nothing nowadays, and there is no breed that will surpass the Holstein-Friesian in either butter or milk production.

The fat particles of Holstein-Friesian milk being very small and the emulsion perfect, they do not separate and rise rapidly as cream; thus making Holstein-Friesian milk the very best for shipping purposes, and for the making of all kinds of cheese. For the same reason, and because it is a perfectly balanced milk in its proportions of fat to solids not fat, it is specially adapted to the rearing of the young calf, and there is no breed that can compete with the Holstein-Friesians in the quantity and quick growth of veals. Reasoning by analogy, any milk that is so balanced as to be the best for the calf, must be best for human consumption, and especially for the consumption of children and invalids.

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By the President:—Is Mr. Janes in the room. We would like to hear from the Brown Swiss?

Mr. Janes:—Yes, sir.

Mr. President and Officers of this Association:

I wish to thank you for your courtesy in recognizing the Brown Swiss cattle as one of the popular dairy breeds. They have been bandied around so long by the breeders of other kinds of cattle from one class to another that people unfamiliar with them do not know where they belong; but I wish to say here that all records for Brown Swiss cattle in their native country, as well as in this country, have been based on dairy performances almost entirely. We have been breeding entirely for dairy purposes and whenever we sell animals the breeders base the values almost entirely on dairy qualification.

The Brown Swiss breed has been rejected by the breeding committee of the National Dairy Show at Chicago on account of its having been associated with other than dairy classes. We had hoped that we might change this sentiment and obtain recognition from them, but thus far have been unable to do so.

There have been about one hundred head of Brown Swiss cattle imported into the United States in the last thirty-five years from their native country, Switzerland. Descended from these about four thousand head have been entered in the herd book and these have been quite generally scattered throughout the whole country. Their hardy constitution, quiet disposition and general adaptability for dairy purposes have created a demand for them that has been far in excess of the ability of the breeders to supply, and the prices paid by exporters for them have been so generous that they have invaded their ranks until the breeders scarcely know where to get stock to supply the demand. Carload after carload have been exported to Mexico and Japan. This heavy export trade, the realization of which the breeders have only just begun to wake up to, and the almost prohibitive quarantine restrictions on cattle from the continental countries of Europe have been such a handicap to the Brown Swiss breed that it is a wonder that the few animals in the country have forced themselves as prominently before the public and attained as much popularity as they have. But during my fourteen years of experience with the largest herd of these cattle in the United States, in which time we have sold animals in almost every part of it and exhibited at most of the principal shows of the country, I have heard nothing but praise from those who have had experience with them.

Some remarkable results have been obtained from crossing the Brown Swiss and the more delicate and less hardy types of dairy animals, imparting in a remarkable degree size, constitution and a more quiet disposition. We have found this to be almost invariably the case in our own experience, and to illustrate I will cite a few of the many instances which have come under my personal observation. During the Columbian Exposition in Chicago, in 1893, a bright old gentleman whose chief business in life was to produce a fine quality of milk and cream for one of the neighboring cities to Chicago, paid a visit to the Stock Exposition. The old gentleman, like a great many others, ran across a herd of "great big Jerseys," (a remark, by the way, heard

thousands of times at the various exhibitions) and upon investigation he found that they were Brown Swiss. His cattle at home were Jerseys, grades and full bloods, and were giving a fine quality of milk, but such a small quantity and needed so much care that he had become almost discouraged. Before leaving for home he purchased a bull to cross with his grade Jerseys. He has since abandoned the use of the Jersey bull entirely. I have sold him three Swiss bulls since his first purchase. His son is now carrying on the dairy business, and they were both at our place a few weeks ago and selected a young bull. They have a herd of about fifty cows and as we are in the market for just such cattle, I tried to obtain some of them. They absolutely refused to let me have any milch cows, even at one hundred dollars each, claiming that they did not know where they could replace them.

I have visited a great many of the neighborhoods where Swiss bulls have been sold, to purchase grade cows to put into our herd, and invariably find the dairymen asking from \$15 to \$20 more for their Swiss grades than for those of other crosses. This is a fact which I think speaks more for the breed than high prices for a few selected, individual full bloods.

In almost every herd of Brown Swiss cattle I know of we find animals with which the owner cannot be induced to part at any price.

The performances of some of these cows under conditions that were anything but favorable have been a surprise to us.

At the Illinois State Fair at Springfield in 1904, after being exhibited through the circuit, at the earnest solicitation of the Illinois Dairymen's Association, we entered two of our cows, Serva and Fleta, in competition with all the other dairy breeds, and to our surprise, and, of course, satisfaction won the gold medal and first and second prizes for best dairy cows in the contest. Serva made more butter in four days than any other cow in the test, except Fleta, made in five.

Belle Windsor, in our herd, for the past seven months has given 7,276 pounds of milk and has made 410 pounds of but-

ter. She is giving at the present time thirty pounds of milk per day. Her average test is about 4.7 per cent.

Tessin gave during the last twelve months 9,400 pounds of milk and an equivalent to 594 pounds of butter. Her average test is about 4.8 per cent.

McAlpin during the last twelve months has made 10,886 pounds of milk and 583 pounds of butter.

Sallie B. produced a big, strong bull calf February 20th, 1905. During that milking period she gave 8,345 pounds of milk and 450 pounds of butter. On January 6th, 1906, she produced another bull calf weighing 120 pounds, and is today producing over forty pounds of milk per day. I sold her 1905 calf at eight months of age for \$125.00.

Florin of River Meadow during an official test gave seventy-two pounds of milk in one day and twenty-three pounds of butter in seven days.

Brienz's official record of 11 2-3 pounds of butter and 245 pounds of milk in three days was considered a very remarkable performance.

The Royal Academy at Poppeladorf, Germany, made a selection of Swiss cows for a test in the years 1900 and 1901. The results for the first year were as follows:

|                                   | Pounds<br>of<br>Milk. | Pounds<br>of<br>Fat. | Pounds<br>of<br>Butter |
|-----------------------------------|-----------------------|----------------------|------------------------|
| No. 1 .....                       | 16,539.95             | 609.79               | 717.80                 |
| No. 2 .....                       | 15,601.59             | 531.58               | 625.39                 |
| No. 3 .....                       | 11,157.59             | 396.74               | 466.75                 |
| No. 4 .....                       | 10,750.42             | 354.56               | 417.13                 |
| No. 5 .....                       | 13,545.66             | 459.39               | 540.46                 |
| No. 6 .....                       | 11,135.35             | 424.46               | 499.36                 |
| No. 7 .....                       | 13,838.12             | 460.34               | 541.58                 |
| No. 8 .....                       | 10,168.89             | 318.34               | 374.52                 |
| No. 9 .....                       | 12,142.85             | 456.44               | 536.99                 |
| No. 10 .....                      | 12,411.62             | 446.61               | 542.42                 |
| Total .....                       | 127,292.04            | 4,458.25             | 5,262.40               |
| Average per cow .....             | 12,729.20             | 445.82               | 526.24                 |
| Average per cow, second year..... | 11,927.84             | 437.55               | 514.76                 |





View of Stage of Austin Opera House, Effingham, During Convention of Illinois State Dairymen's Association.



\*During the second year a record was kept of but eight of the original ten cows.

The above represents a test at one of the Royal Prussian agricultural stations.

These examples tend to show the serenity with which the Swiss cows adapt themselves to their surroundings and attend quietly to their business.

We find many of the Swiss cows at their best at twelve or thirteen years of age. The calves are generally quite large at birth. I have weighed many of them and found them weighing over 120 pounds, and in one instance a calf weighed 155 pounds. This calf at six months weighed 795 pounds. They grow rapidly and I think will accumulate more weight at two years of age than any other breed I know of. They are good rustlers. Generally speaking, they are not a smooth cattle, but the tendency of the breeders of this country has been toward more refinement. They carry more meat than the accepted dairy form of the modern teachers, but it must be remembered that their normal condition is meaty.

We are milking in our dairy at Sedgeley farm about 120 cows, about 75 per cent of which are full blood or grade Swiss. We would like to be able to obtain all Swiss cows, as from our experience we have found them more persistent milkers than other breeds and they keep in better condition on the same feed, and, all around, are the most satisfactory cows we have been able to obtain. The herd average of milk is 4.2 per cent. Of course, we have found what we considered unprofitable cows among the Swiss cattle, but by judicious weeding have attained a standard of excellence of which we are proud.

Not the least pleasant feature in connection with the breed is its freedom from disease. All the cows in our herd are subjected to the tuberculin test before being introduced into it and are annually tested before becoming a part of it. It is a remarkable fact that while ten per cent of all the common cows that we have intended to put into our herd since we commenced

testing have reacted; not two per cent of the Swiss grades and full bloods have reacted.

As a farmers' cattle I think the Brown Swiss cattle are unexcelled; as a cattle to grade up native cows they are most prepotent; and I am satisfied that their more general introduction among the common herds of the country will certainly help to improve materially the quality of the dairy cattle.

W. E. JAMES, Hinsdale, Illinois.

By the President:—Is the Chairman of Committee on Resolutions ready?

Mr. Kimsey:—He is.

By the President:—I would like him to report a resolution on the change of name, for according to the By-laws we have to give notice one day ahead of action.

Mr. Kimsey:—I would ask the Committee on Resolutions to meet in the rear of this hall immediately after the close of Mr. Janes' paper.

By the President:—Mr. Crabb of Litchfield is down for the Ayrshire breed, is he present?

#### DISCUSSION.

Q:—How many pounds do those Swiss cattle give in a year, the whole herd?

Mr. Janes:—I haven't the statistics with me; I don't know as I could give it of milk. I could not give you offhand those statistics. We keep a record of every cow and every milking of our cows. We test all of our cows both the full blood and the grades and keep a record of all they do every year. Weighed immediately after milking. I have a cow at the barn here. If you will leave your name and address with me or with the man at the barn, I will send you a catalogue which I have now in the hands of the printer, and will be ready in the course of a couple of weeks.. It will give the statistics as near as possible. We are raising our cattle for dairy purposes entirely. We furnish a high grade of milk and cream to Chicago trade. I expect we obtain the highest price paid in Chicago. The morning's

milk of our herd is separated and sent in as cream; the night's milk is bottled and sent in as whole milk. We raise our calves from the morning's skim milk and the evening milk is sold as whole milk.

Q:—How many listed in the catalogue?

A:—The records of, perhaps, thirty cows will be in the catalogue.

Q:—Have you a test of the cow you have here with you?

A:—Yes, sir.

Q:—What do they test in general?

A:—Average of 4.2 per cent, the average herd test. This cow is tested rather high for the last month of 5 to 6 per cent. It has varied between that. It is a little mite high for her, about 4.7 or 4.8 usually, from 50 to 55 pounds of milk. She came in about a month ago.

Q:—Between 5 and 6 per cent?

A:—Yes sir, it has been higher than we are accustomed to: from that down to 5 per cent. It has been above what we consider usual—a little abnormal.

Q:—The Holstein man, his dairy test?

A:—My herd run about 3.5. They run all the way from 3.4 to 3.8, running about 3.8 at present.

Q:—What are the number of pounds in the year?

A:—We have been three consecutive years with Glover, and I think the last year—I could not say exactly—but about 9,500 pounds, including heifers and all. They made almost 400 pounds of butter for the milking period, about ten months, and averaged about 3.4 for the year. One cow I can speak of gave 12,318 pounds of milk, 512 pounds of butter, 80 per cent fat, average of 3.4. That was the largest record made in Illinois for the year that Glover tested. We had several cows in our herd that made yields from 3.7 to 4 per cent. The first year I owned that cow she gave 11,102 pounds of milk, 458 pounds of butter. During this milking year she was shipped from Minnesota and was three days on the road.

Sixty-five pounds a day during official test 3.5, 19 pounds



of butter, a four-year old, made 19 pounds, four ounces,  $81\frac{1}{2}$  butter in 4.6 and 3.9, practically 4 per cent, four years old.

Q:—You claim vitality in their milk?

A:—Very large, strong, vigorous animals have more vitality in their milk.

Q:—What does Gurler get for his milk?

A:—Twelve cents a quart.

Q:—Holstein milk?

A:—Yes sir, mostly Holstein milk. His milk is standardized to 4 per cent, but gave some trouble, had to take off a little cream to get back to 4 per cent. If we have Holstein cows and testing 3.5 they are worth holding. It is a pretty good animal. Holsteins, 50 pounds 3 per cent milk, you know what that means,  $1\frac{1}{2}$  pounds of butter. In the St. Louis test it showed. Three men limited to set amount of capital put in Holsteins. We didn't have any millions to back Holsteins.

Q:—The Jerseys were sent down a year ahead and were acclimated?

A:—Yes, I know that.

By the President:—Just a minute; one at a time.

Q:—Didn't the Jerseys people build a silo and have it filled on the grounds at the world's fair?

A:—I understood so.

Q:—The Holsteins had to buy the silage the Jersey fellows threw away, and the Holstein beat a Jersey on the ground.

Mr. Janes:—While this question is on in regard to Holsteins and Jerseys being put in the St. Louis test, we have heard all kinds of tests in regard to comparative merits. The Brown Swiss are quoted along with them. I understand the Brown Swiss in that test were all taken from one herd, and from only an ordinary farm. The farmer was no professional, didn't know anything about the feed, and he took what feed was handed to him. It was one man doing the whole business. They have stood on their merits.

Mr. Austin:—Isn't it a fact a great many of the millionaires keep Jerseys for a plaything and spend money on them at

demonstrations. We fellows haven't got the money to spend for our cows. The Jerseys had that. The Brown Swiss were not foresighted enough to have things there earlier. The Holsteins went from 85 to 45, but the Jerseys went right straight along, for they had electric fans keeping the flies off the cows. If the Holsteins had had the fans and been able to hold up, what would the records have been.

Q:—Mr. Janes—What cow have you here on exhibition, what has she done the past year?

A:—She came in about a month ago; don't know the exact date of calving. She is milking 50 to 55 pounds of milk a day. She is twelve years old and she refuses silage; on dry feed entirely. Some way she doesn't seem to take to it.

Q:—She can switch her own flies?

A:—Yes sir, and pick corn fodder with any cow in the herd. It is characteristic of the cattle to be the most quiet cattle I know of. You can go and look at her and she will chew her cud. I wanted to bring her up, but was afraid she wouldn't go down.

Q:—Test?

A:—From 5 to 6 per cent. It seems to us that is abnormal. She was put on the wagon Monday morning in order to get her down here for Prof. Fraser. She stood up all day from 8 in the morning until 5 in the afternoon, and she arrived last night, and that is what she is doing now. I left a sample this morning of her milk. I wanted the people to see her bag full, but they had let her milk out.

Q:—A Sample of that milk here?

A:—Yes sir.

Q:—It will be tested?

A:—Yes sir. The men in the barn are drinking the milk, the top off.

Q:—The Red Poll cattle?

A:—We have had a little experience. I didn't advocate her for dairy breed. A farmer's cow. Some good success with grading the high bred dairy sires. Quite a number of good

crosses, better than the Short Horn crosses to pick up. For distinct dairy purposes I would not recommend them. I have changed from Red Poll sire to Holstein and Jersey, one of each. They are a farmer's cow that belong a little farther west, not on these high price lands.

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### BUSINESS END OF DAIRY FARMING.

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By J. P. Mason, Elgin, Ill.

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Ladies and Gentlemen:

During the last year or two I have met a good many farmers who live in a locality where dairy farming is not practiced, and where land is selling for \$100 to \$150 per acre. And I have always put the question to them, whether with their system of farming it would pay one year with another all the expenses of the farm, including all labor performed on the farm, interest on capital invested, and still leave a profit.

The answer has been invariably, no! If this is so, how is the man with limited means, or the young man who wishes to engage in agriculture going to buy and pay for a farm.

It must be one of two things, either the system of farming is not the best or the land is selling for more than it is worth. Why should not the farm be run just the same as any business venture? Not just for the simple means of making a living, but as a business for making money. And why should not the farmer be paid for his labor just the same as the commercial man or manufacturer.

I do not know of any line of farming that is less speculative, safe and sure for the average farmer, one year with another, equal to dairy farming. We have found that our cows are our best customers for the products of the farm, paying us the highest market price for the same. With our unlimited wholesale market for milk, prices do not fluctuate like they do

in the production of beef, pork or grain. If the prices do lower it is usually on account of an abundance of feed. When I speak of the unlimited market for milk, I have been a patron of the condenser for 25 years and I can not remember of but one or two seasons during that time when they held the patrons down to contract. Any other time they would take all you wanted to bring, regardless of contract, paying the same price.

But how often we hear the cry that dairying does not pay, and why, because it is not run on business principles. That is why.

Too large capital and expenses for the business done, not milk enough produced to balance it down and leave a profit. What other business is there where you can invest \$20,000 to \$40,000 and never keep track of anything—income, outgoes and expenses—and hold together as long as farming. Not any that I know of.

There are a few details that need looking after that are essential to successful farming. One is—to know if each cow in the herd is giving milk enough—equivalent to her feed and care, and leave a profit; or does she cut down the profit of some cow that does do this? It is an easy matter with the Babcock test and scales to ascertain the performance of each cow at the pail.

This weighing the milk will get a person interested in his dairy work. I have found in my dairy two cows that give milk enough so the gross receipts were equal to  $1\frac{1}{2}$  per cent per day of the cost of the cows, or that paid for themselves in milk in 67 days. They were two of the highest priced cows in the herd. I also found that several of the cows would pay better than 1 per cent per day of their cost, consequently would pay for themselves in 100 days or less. While the average of the entire dairy in milk, gave milk enough to pay 25 per cent of their cost in the month. Or at that rate would pay for themselves in four months. Another detail of the business is to know how much is invested in high priced land, how much in high priced

machinery, how much in high priced stock, high priced feed, high priced labor, etc. Or in other words, keep a strict book account of transactions of the business, so you will know where you stand each and every month. Post yourself upon quality and yield of crops, and on the type, quality and value of stock you wish to keep—all of which will tend to raise the standard of farming.

Now the question is, are we making the most of the opportunity offered. For instance, over here at the experimental field at Edgewood, where they told Dr. Hopkins the land was so poor it would not grow clover, and did he not with a little treatment of the soil grow a ton and a half to the acre. The following season it was planted to corn, and when we visited the field in September the general opinion of the twenty-five or thirty farmers present was that it would yield 75 to 85 bushels per acre, which I should judge was double or nearly triple the yield of other fields in the immediate vicinity.

If the land responds so readily to treatment of that sort, it is easy to see the benefits to be derived from the keeping of a dairy—on the soil in this locality. Having scales near the barn I have made it a point to determine the amount of fertility a dairy will produce per cow in 24 hours. The cows being stabled all of the time with the exception of half an hour or so.

And I found by weighing the manure for several days in succession that a cow would furnish an average of 85 pounds. The cows are heavily bedded and kept on cement floor, so all the fertility is saved. This is one of the important factors in dairy farming.

During the past season the Department of Agriculture sent out a man to different states to find out the farmers' way of keeping up the fertility of the soil. I gave him this illustration. For instance, take an acre of corn, say 50 bushels, which is a moderate yield, and would make 2800 pounds of finely ground meal. Add to this 2800 pounds of light flaky bran, which would make 5,600 pounds. Now I think you would all agree with me that 20 pounds of this mixture would make a good feed for a



dairy cow. And an ordinary dairy on this feed would produce a can of milk to three cows, and the fodder from which this corn was threshed would furnish the roughage. And at this rate the 5,600 pounds would feed the three cows 93 1-3 days, or produce 93 1-3 cans of milk, which at \$1.00 per can is equivalent to \$93.33. Now deduct the price of your bran at \$14.00 per ton, which is \$19.60, and you have marketed your acre of corn for \$73.73, and still have 12 tons of fertility to put back on the land. I will admit that this is not the best way to feed a dairy, but it is a profitable way to market the corn. You might by having good early cut clover hay, produce as much and perhaps more in milk on two-thirds of the grain, but you would not receive as much per acre of land.

#### DISCUSSION.

Q:—Do you use a manure spreader?

A:—Yes, sir, when it will run. It does good work in light or well rotted manure, but in green manure we have a good many breakages. It is not built strong enough to stand the strain.

Q:—How large is it?

A:—It holds probably ten bushels.

Q:—What will that weigh?

A:—I should judge about 2,500 pounds.

Q:—How many horses?

A:—Two—sometimes three.

Q:—What kind of spreader.

A:—Mine is the Kemp. Have had no experience with any other kind.

Q:—When do you put your manure on the field?

A:—We haul it daily from the stable to the field, when it is not too wet. If it is very muddy we put it in a pile. There is nothing worse for land than driving over it when it is wet.

Prof. Fraser:—You want to grow some clover do you not?

A:—Yes sir. We try to have a new piece of feeding each year, but often lose it on account of frost.

Q:—You can not apply your northern Illinois ideas to us here.

A:—I do not see why. The corn will produce the most feed per acre, which will keep more stock and build up your land.

Q:—It would be more valuable to use cow peas till we get the land able to produce that.

A:—I do not know what would bring your land up faster than this dairy business.

Mr. Lindley:—I say it would be more valuable to this part of the state, more fertility and more manure to draw out. The question was asked Mr. Mason if he would have rotation of crops, and if it would work the same way. I meant to illustrate that all he said about northern Illinois would not apply to us here.

A:—What I said applies to any locality where they need a good lot of fertility and a little bit of money.

Q:—What porportion would be the most economical for a farmer to do—this way or half corn.

A:—As a rule we seed our oats to clover, which seldom equals one-third of the acreage of corn. Then we frequently lose the entire crop of clover by frost—when we have to resort to corn entirely.

Q:—What is your rotation?

A:—Corn, oats and clover. Pasture.

Q:—How thick do you plant your corn to produce the most feed for milk?

A:—Not too thick, so as to have good grain and lots of it.

Q:—How fine do you grind your corn?

A:—Just as fine as you can. Cannot get it too fine.

Q:—So you can not see the cob?

A:—I want it ground so you would not know there was any cob in it.

Q:—What kind of grinder do you use?

A:—I use a Bousher No. 8. Mr. Haeger does the best custom work I ever saw done. He can tell you what machine he uses.

Mr. Heager:—It's what they call an Attrition machine. Pennsylvania make, 24 in., one wheel turning one way and the other in the reverse direction.

A:—No. Steam.

Q:—How many acres are you farming?

A:—Two hundred and sixty-five acres in our dairy business.

Q:—How many cows?

A:—We are milking at present 100 cows.

Q:—How many cans of milk?

A:—We are producing at present 40 cans. We run from 38 to 40 cans during winter months.

Q:—How much for a month's milk?

A:—The January milk check is generally the highest of the year. Last year it was \$1,235, and will be no less this year.

Mr. Lindley:—Another question. You are showing us by your experience how we ought to feed cows to produce milk?

A:—I am trying to show you how we have produced milk from our way of feeding.

Mr. Lindley:—And your results are the best of any ones as far as you go. One thing, it leaves a bad impression on our farmers, the way you feed your cows. You can't take a cow and feed her and keep her in your dairy four or five years and feed her like Mr. Mason does. If you intend to take a cow and feed her to death the first year and produce every bit you can.

A:—There is no danger of feeding the cow to death or injuring her if the feed is properly and thoroughly mixed and bulky. I have some registered Holstein heifers with first calf. I feed them all the grain they will eat three times per day, and keep a good appetite. I think it will develop them more and make better milkers of them.

Q:—Will your cows fed like you say produce the same amount of milk next year?

A:—They usually do better the second year.

Q:—Your experience is different from mine.

Q:—Some cows will bear that kind of feed; others will go to fat.

A:—The big milkers do not usually get overly fat.

Mr. Newman:—Have you got any cows you have had three or four years—fed this way?

A:—Yes sir, some we have had eight or ten years and even longer. I look at a dairy farm as a manufacturing plant. The cows are the machinery for turning the raw material of the farm into the finished product, and like any other manufacturing plant, to make it profitable, it should be run up to its full capacity. The same with the dairy cow, if she is properly cared for and well fed you can bring her up to her full capacity without fear of hurting the cow.

A Member:—Do you think fresh corn ground is good for them?

A:—Yes sir. Mixed with light, flaky bran, pound for pound, thoroughly mixed.

Mr. Lindley:—We listened here to a professor a little bit ago on the value of feeds and the protein there was in them. He told us that if you feed more protein than necessary to the production of milk it was wasted? Are you not wasting lots of feed?

A:—I have not learned it all yet I know.

Q:—Have you tried to find that out?

A:—Yes. Sure.

Q:—If the professor is right you are wasting a lot of feed?

Prof. Fraser:—He feeds a lot of bran. He gets protein in that. No protein waste. It is carbohydrates wasted.

Mr. Lindley:—He's got too wide a ration.

A Member:—He is losing feed value.

A:—There are a few dairies in the vicinity of Elgin that are doing well. One a cash renter that is producing 30 cans of milk from 70 cows, another that is making 25 cans from 60 cows, another 22 cans from 45 cows, with one 19 from 40 cows, and so on. There are probably twelve or fifteen of them, and I have taken pains to find out how they were feeding. They all admitted they gave them all they would eat, and not get off from their feed. They all had good clover hay.

Mr. Newman:—We hear a great deal of these experiments, but I will take a man's bank account and his farm against the professor's theories.

Mr. Lindley:—I don't suppose there is a man on earth who has been after me to try and make an appropriation for this college more than you have. (Meaning Mr. Newman.) Now don't you come again.

Mr. Newman:—If the gentleman will look at the proceedings of this association for the last five years he will find that our plea for the college is for money to send men out into the field just as Hopper, Glover and McLaughlin.

Mr. Lindley:—You say you don't want theory?

Mr. Newman:—You are putting it wrong. When it comes to a question of theory—I know this man's farm and you know your farm, and I say if their theories don't agree with his practical experience I will take his experience.

Mr. Lindley:—One more word on the subject of practical matter, Mason has done well, the only thing is, if he had a little more theory couldn't he do better?

Mr. Newman:—That is what he says. He is rubbing against the university and they are rubbing against him, and both are improving.

Mr. Lindley:—You want to take the practical man against the other. When the theory man leans the practical man learns some things too, and it works the other way too.

A:—That's right. If it wasn't for the professors we wouldn't be getting the theoretical part of it.

Mr. Lindley:—Why doesn't he feed their way then?

Mr. Mason:—We are accustomed to this way of feeding, but by getting in closer touch with our Agricultural College and learning of the advantage of the silo, alfalfa and other crops, etc., we expect to improve.

Mr. Newman:—You think you can do better?

A:—I do not think any of us dairymen are doing over two-thirds of what it is possible to do on a dairy farm.

Mr. Lillie:—You mean to make it cheaper?



A:—Yes sir. That is what I mean. By doing better farming, raising larger crops, and keeping better cows. It works both ways.

Q:—How many pounds of milk can you produce per acre per year?

A:—On our little farm of 120 acres that is rented on halves, in 1904 we kept on an average of 46 cows, it ran a little larger in the winter and less in summer, by buying 60 tons of bran and oil meal, or 1 1-3 tons per cow. We raised all the corn and hay and had some left. We produced 183 tons of milk or about  $1\frac{1}{2}$  tons per acre. By making the most milk in winter, when the price is highest, we brought up the average price of the year to \$1.31 $\frac{1}{2}$  per 100 pounds. The bran is good for the cow and makes a good flavored milk, and is good to build up the soil.

A Member:—What did you get for your milk in June?

A:—For what went to the condenser we got 80 cents per 100, or 54 cents per can. The milk we shipped to Chicago, 69 cents per can clear of freight.

Q:—An eight gallon can?

A:—Yes sir.

Mr. Mason:—I have never attended a dairymen's convention where the interest was keener for information, nor the advantages for the dairymen were better. With your low price of land, less than half what it is with us. And you need the fertility which would soon double the capacity of your farm, also materially increase its value. While the price of milk is the same as it is with us. One can readily see the advantage of the opportunity offered.

Mr. Lillie:—When you turn your cows on pasture do you take the grain away from them?

A:—We do not feed but little, but always give them some so they will always come at milking time, and increase it as the pastures becomes short.

A Member:—Do you raise your calves?

A:—I have only got started on one. I will tell you more about that later.

Q:—You don't raise calves?

A:—No sir, but I intended to when I get the standard of my cows high enough to make it worth while.

By the President:—We will have to close this portion of the program.

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### DISEASES OF COWS AND HOW TO TREAT THEM.

By Dr. D. McIntosh, University of Illinois.

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Gentlemen:

I have been asked to come here to talk on the diseases of the cow, but they are so many that it would take several weeks to tell you about them all.

This afternoon I will talk for a short time on the udder of the cow, because I think the derangement of that organ is more troublesome than other diseases we have. In order to be able to treat this organ, I will give you the outline of it.

The udder of the cow is divided into two parts, and these again are sub-divided into four compartments, and these compartments, four in number, are thoroughly separated from each other, so that one quarter may be diseased, while the other three-fourths may be clean and perfectly healthy.

The sections of the udder are made up of glandular material, and this glandular material is filled with cells. These cells are lined with material known as secreting tissues. It is not necessary to go into this here as it is not of much importance, and some of it is not very well known, but the material secreted from the blood by these cells and these vessels is converted in some way, not very well understood, into milk. From these cells small tubes carry the milk to the part of the udder known as the cistern above the teats. These tubes are very small and very numerous, but they unite with one another and form larger tubes before they reach the cistern.

The teat of the cow is quite large, and there is only one opening through it. This opening is surrounded by a thin layer of muscular tissue which contracts and prevents the milk from escaping. This is a little stronger near the point of the teat. If these muscles relax more than natural there will be a leakage of milk from the teat. The necessary remedy is to get a rubber band and put it on the teat, but not too tight, but tight enough to stop the milk from leaking but not to stop the circulation. This will rectify it. On the other hand, some cows, in which these muscles surrounding the teat, do not relax enough, are called hard milkers, and it is a difficult matter to remedy this. The best method is to use a small milk tube first, and then a large one. It must be kept in the teat for a time. It can be fixed by putting a string through the eye of the tube and over the loins. You will lose milk for a time, but it is the most profitable method.

The causes of inflammation of the udder are injuries, such as kicks, blows, scratches, being horned by other cows, or by the animal having to lie on a hard floor. It may also be caused by the animal being too fat, or by being fed on too sloppy food. Another cause is allowing the udder to become overdistended with milk, either before or after calving. When the udder becomes overdistended with milk inflammation ensues, causing the glands to become hard and caked. The inflammation also causes the milk in the udder to coagulate and separate into curds and whey, and when the teats are drawn shreds of coagulated milk come away mixed with the whey. Sometimes the coagulated milk will fill up the orifice of the teat and allow nothing to pass through it. This is a bad complication, often destroying a part or the whole of the udder. To prevent this disease, see that the cow's udder does not become overdistended with milk before calving. Milk out enough milk to keep it soft and no more. This will prevent it from becoming inflamed. There is a prevailing idea that milking a cow before calving is an injury and prevents or prolongs the period of calving. This is a mistake, as

there is nothing we can do that will interfere with nature in this respect.

When this disease occurs in the form of inflammation or hardening, the best method is to give Epsom salts. We generally give  $1\frac{1}{2}$  lbs. and 1 oz. of ginger dissolved in one-half gallon of water at one dose. It cools the system and has a beneficial effect on local inflammation. Follow this up with  $\frac{1}{2}$  oz. doses of nitrate of potassium in drinking water or bran mash. It reduces fever and stimulates the kidneys, all helping to reduce local inflammation.

For acute cases, while the udder is hot and tender to the touch and painful for the animal to move, rest is one of the first principles. The best method to do this is to get a sack—an ordinary sack will do—and cut four holes in it for the teats to protrude through; get four pieces of rope and attach to the ends of the sack and tie them tight over the loins to support the weight of the udder. We bring one rope behind the udder and up by the edge of the tail and tie it to the nape on the loins and you will find it is an excellent sling for the udder. It removes the weight of the udder and reduces inflammation. Then we put soft rags between the udder and the sack. Then mix up one ounce of acetate of lead with a quart of water. Keep the cloths on the udder constantly wet with this. Better have some one to attend to this night and day. Apply every half hour to do it well, and continue for 24 hours, and usually by that time the inflammation will be subdued and the udder in as good a condition as before the inflammation took place. When it does take place it causes coagulation of the milk in the cistern and also in the teats. Therefore, when milking a cow in this condition, there is nothing but whey and curds. We must keep the cow milked out as much as possible. If we have the calf, let it suck her, as it can draw away more milk than we can, and it will do the calf no harm.

If we find the udder is caked and hard without any inflammation being present, the treatment needed here is to give the animal Epsom salts to clean out the system, and then run the

parts of the udder thoroughly with soap liniment. Friction is an excellent remedy for reduction of hardness in the early stages. Rub thoroughly twice a day. If the udder seems to become sore, rub without the liniment. In all cases of hardening of the udder, give the animal medicine internally. Iodide of potassium has a special action on the glandular structures of the body and changes the condition of existing circumstances, so we give the animal two drams of iodide of potassium in a small brand mash twice daily, and continue for three weeks. Remember this hardness takes time. If after this time the liniment has been of no service, use an absorbent ointment, 1 oz. vaseline, 1 dram iodine, and apply a little every second day, and try if possible and get all the milk out. When you get it soft, you will have the milk from it. If these conditions are thoroughly attended to as soon as possible, this derangement known as inflammation and hardening of the udder does not do as much damage as thought. If it does it is just because there is not a proper idea of how to treat them. There are some who treat them properly, but the majority do not. Therefore stimulating liniments should not be used on inflamed udders. There is no medicine that we know of that is equal to the acetate of lead for inflammation. Liniments are all right on hardened udders, but entirely wrong on inflamed udders. Hot applications on inflamed udders are better applied almost continuously until inflammation is subdued.

We frequently have trouble with the udder forming matter. There is, if the disease is not properly treated, danger. The abscess will have to be opened and matter removed. One part carbolic acid and fifty parts water will do to inject into it. Mortification sometimes occurs and it should be treated by a veterinary.

We are troubled sometimes with hard substances forming in the teats. These little substances will get into the teat and block up the passage. When we examine them they are hardened glands of the udder. They become detached in some way and find their way into the teat. If they are large enough,



they will not come through. You can have a good deal of trouble with these things. If we make any attempt to cut, we injure the teat. The best method is to use the milk tube until they disappear. We have instruments to introduce into the teat, but they usually do more harm than good. All that is necessary to do in such a case is to draw the milk off with the tube, until these small objects disappear, which they will.

We have another disturbance in the teats, a form of skin disease, called acne, which gives a great deal of trouble. It is mistaken for cowpox. There is a great difference between that and acne. Acne is sharp at the point. Cowpox, when it starts, goes up like a perpendicular wall. It usually rises one-eighth inch above the surface, and after the third day serum exudes, leaving a hollow in the center. We can tell the difference in that way. Cowpox exhausts itself in about three weeks' time and does not return. Cowpox never affects the animal the second time. If a cow having cowpox is standing in the barn with the others, they will not take the disease. It is only gotten by contagion or by rubbing in. This trouble, acne, will appear on the teats and udder of the cow, and sometimes on the inside of the hind legs, and when one crop goes away, another crop makes its appearance, and will go on from one month to another and sometimes longer, and is very troublesome. The best way to treat this disease is to give internal medicine. With cowpox we do little but milk with the milk tubes, you can't stop it. Acne is a condition of the system, necessitating giving the cow a dose of medicine internally. We give 1 ounce Fowler's solution of arsenic at a dose twice daily in her food for five or six weeks. It has no action on the milk the cow gives.

These are the principal things we find connected with the udder of the cow, with the exception of some internal things. The cause of the cow's giving bitter milk is due to some chemical change in the udder that is not well understood. You will sometimes find benefit from giving a dose of physic and changing the food.

Any questions about the udder that you would like to ask?

## DISCUSSION.

Q:—What is the cause of the cow giving thick milk, probably one or two milkings, and coming regular after that time?

A:—An irritation in the glands of the udder that belong to that treat. The best treatment for this is to give 2 drams iodide of potassium at a dose, twice a day in bran mash.

Q:—What do you use as a solution to apply to the udder when badly caked?

A:—When cold to the touch use iodine ointment rubbed in thoroughly once every third day, and give two drams iodide of potassium twice a day in bran mash until it disappears.

Q:—What was your solution?

A:—We use 1 dram of iodine to 1 oz. of vaseline. Sugar of lead when hot. Remember the difference between a caked udder when cold to the touch, and an inflamed udder with a hot and tender surface. The treatment is entirely different. If hot and tender to the touch mix 1 oz. acetate of lead with a quart of soft water and thoroughly bathe with that several times a day. If hard and not hot to the touch then use the iodine ointment.

Q:—The best way to remove warts?

A:—Is to tie a thread around them until they come off, then use nitrate of silver to destroy the roots of the wart. When the roots are destroyed, they will not grow again.

Q:—The best remedy for indigestion?

A:—Change the food as much as possible, and feed the animal on small quantities of nutritious food. Give a dose of Epsom salts, one and one-half pounds, to clean out the stomach and the general system. Then give a teaspoonful of sulphate of iron in a bran mash twice daily. If a cow or a steer is fattening and shows a sign of not getting benefit from its food, a dose of Epsom salts will be the quickest way to get it back to

its food again. Sometimes it is only necessary to change the food. We can make a quicker job by giving the animal a good dose of physic and then giving a tonic afterwards. One ounce each of tincture of ginger and gentian in one quart of water at a dose twice a day. These are stimulants and tonics and are therefore used for stimulating the stomach and the acid juices.

Q:—I have had some trouble with their feet getting sore?

A:—That is quite a common trouble among cows and we don't know the cause of it. We don't know what produces it. It seems to be natural to cows under certain conditions to get inflammation between the claws and around the top of them. It is impossible to prevent it, but we can get rid of it. We do that by cleaning the feet properly and bathing them with warm water. The best remedy for healing is chloride of zinc, one dram to one-half pint of water. Bathe the parts thoroughly with it twice a day, and keep the animals in a dry place, so that they can't walk around much, and in a short time the feet will heal.

Q:—How is muriatic acid if poured on the sore?

A:—Depends on the condition. If we find a growth of unhealthy tissue and necessitating removal by strong caustic, muriatic acid would do, but there are some things better. You can use pine tar. But pine tar will not remove the unhealthy tissue, you would have to put a caustic on it, so that it will burn off.

Q:—I put the pine tar on right away.

A:—That's right.

Q:—Is there any prevention for abortion?

A:—No, we have nothing very satisfactory. There is some advantage in using one dram of carbolic acid twice a day, keeping it up about a month, and then skipping a couple of weeks, and so on. We have an idea that some advantage may be derived from that. It seems almost impossible to get at the foundation

of some of these peculiar abortions. We made experiments, a number of years ago, by feeding twelve cows six weeks on all the corn smut around the country. We took the secretion from the pen where an aborted cow had been and injected it into the vagina, and failed to produce abortion. We have tried a variety of methods to produce this derangement, but we failed when we did anything along that line. At the present time we have nothing that we can say will for a certainty prevent abortion. You must feed the cows on good nutritious food, and don't keep them too fat, and there is no harm whatever in giving carbolic acid; that is, one dram at a dose twice a day and continuing it for month, and then skipping two weeks and giving again, until the period arrives for the animal to have her calf.

By the President:—We are all interested in this, but the doctor has to go on this train. If you pay your dollar and become a member of the association, the doctor's address will be published in that and you will receive it when the books are out.

By the President:—The Committee on Resolutions will now report on change of name.

Read by Mr. W. R. Kimsey.

To the President and Members of the Illinois Dairymen's Association.

Gentlemen:—We, your Committee on Resolutions beg leave to submit the following partial report, viz:

That in order that our official name may correspond with the generally used name of our Association, we would recommend that Section 1 of our By-Laws be amended by prefixing the following sentence to the section as it now reads, viz: that "This Association shall be known as the Illinois *State* Dairymen's Association," further:

Resolved, That the Board of Directors elect be empowered

to take such legal steps as are necessary to secure the legal change in name.

Respectfully submitted,

Walter R. Kimsey,  
D. C. Haeger,  
F. G. Austin.

By the President:—Are you ready for the question?

All in favor say "I." Contrary. Carried.

I want to congratulate the committee for giving us such a splendid audience, but we wish there were more ladies. I will call a meeting of the Directors of this Association at the Pacific Hotel at 9:30 tomorrow.

The gentlemen who have left their railroad certificates to be fixed can get them at the Secretary's table. Those not handed in, please do so, as the agent will be here at 5 to finish them.

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#### THE DAIRY COW.

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Her good points pointed out by Prof. W. J. Fraser, who will have live cows for illustration. (Held out of doors.)



| SCALE OF POINTS—COW                |   | Possible Score | Points Deficient |            |
|------------------------------------|---|----------------|------------------|------------|
|                                    |   |                | Student's Score  | Cor-rected |
| Indicating Milking Qualities<br>30 | <b>UDDER.</b> —Capacious; full and attached high at the back; extending well forward; quarters evenly developed; preferably free from fleshiness; (omit for male).....  | 14             | .....            | .....      |
|                                    | <b>TEATS.</b> —Uniform; of convenient size and length; placed well apart; of nearly equal diameter from base to point; free from lumps, warts, extra orifices, or leakages; throwing clean streams with reasonable pressure; rudimentary in male).... | 6              | .....            | .....      |
|                                    | <b>MILK VEINS.</b> —Large, tortuous and much branched. Milk wells large..   | 4              | .....            | .....      |
|                                    | <b>RUMP.</b> —Broad at both hip and pin bones, indicating pelvic capacity...  | 3              | .....            | .....      |
|                                    | <b>TEMPERAMENT.</b> —Strongly indicating maternity; (in male masculinity) .....   | 3              | .....            | .....      |
|                                    | <b>BARREL.</b> —Long, deep, full at paunch with plenty of space between last rib and point of hip .....   | 10             | .....            | .....      |
|                                    | <b>BONE.</b> —Medium, as indicated by clean face and legs with smooth joints, short cannons and long, slim tail. Extreme fineness undesirable .....   | 3              | .....            | .....      |
| Indicating Feeding Qualities<br>30 | <b>WITHERS.</b> —Narrow, smooth over top; not higher than rump .....  | 3              | .....            | .....      |
|                                    | <b>MUZZLE.</b> —Wide, full lips .....   | 2              | .....            | .....      |
|                                    | <b>FACE.</b> —Broad between eyes, fiat or dished, not bulging .....   | 2              | .....            | .....      |
|                                    | <b>EYE.</b> —Full, clear, quiet, set well forward, not in side of head. ....  | 2              | .....            | .....      |
|                                    | <b>NECK.</b> —Medium to thin on top, and fair length (thicker in males and crested with age) .....  | 1              | .....            | .....      |
|                                    | <b>THROAT.</b> —Clean .....   | 1              | .....            | .....      |
|                                    | <b>DEWLAP.</b> —Light .....   | 1              | .....            | .....      |
|                                    | <b>HANDLING.</b> —Skin medium thick, mellow, loose, not hard or papery, hair fine and soft, not wiry; inside of ears furry, switch long and silky...  | 5              | .....            | .....      |

| SCALE OF POINTS—COW  |   | Possible Score  | Points Deficient |            |       |
|--|---|---|------------------|------------|-------|
|  |   |   | Student's Score  | Cor-rected |       |
| Indicating Constitution and General Health<br>25   | { | <b>CHEST.</b> —Deep and full, showing plenty of lung capacity, wide on the floor and full at the elbows.....  | 8                | .....      | ..... |
|  |   | <b>LEGS.</b> —Straight, neither knock-kneed or sickle-hocked .....  | 2                | .....      | ..... |
|  |   | <b>BACK.</b> —Straight, sometimes drooping with age .....   | 2                | .....      | ..... |
|  |   | <b>PASTERNS.</b> —Short, strong and upright .....   | 2                | .....      | ..... |
|  |   | <b>GENERAL APPEARANCE.</b> —Thrifty, neatly formed, not badly marked ...  | 5                | .....      | ..... |
|  |   | <b>CARRIAGE.</b> —Active, but not nervous.  | 6                | .....      | ..... |
| Symmetry<br>15   | { | The proper balance between the different parts of the animal's body, including general neatness and smoothness of form; in males greater relative development of shoulders, neck and head ..... | 15               | .....      | ..... |
| Total .....  |   | 100   | .....            | .....      |       |
| Other particulars in which cows vary are not listed above because their connection with milk production is questionable, or at least not understood. For example, the escutcheon, rudimentaries, color, etc. |   |   |                  |            |       |
| <b>WEIGHT.</b> —Estimated..... lbs.; actual..... lbs.  |   |   |                  |            |       |

Animal .....

Student ..... Date.....

Adjourned until 7:30 p. m. Wednesday evening.

## Wednesday Evening, January, 17, 1906

President in the chair.

The first on the program this evening is music by the orchestra. Encored.

By the President.—The Dairy Association, in bringing gentlemen to talk to their organization, aim to bring men at the head of their class, and we have gone over to Michigan, and will hear from Mr. Lillie, who is President of the Michigan Dairymen's Association.

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### SELECTING AND BREEDING DAIRY CATTLE.

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By Mr. Colen C. Little.

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Mr. President, Members of the Illinois State Dairymen's Association, Ladies and Gentlemen:

I wish to take this opportunity to thank the management of the Illinois State Dairymen's Association for inviting me down here this evening. I came down to you more from a selfish standpoint than any other. We have, in Michigan, inaugurated a dairy campaign with this motive—more and better milk, butter and cheese for Michigan. It was with the idea of getting something down here which would assist me in getting more out of this campaign that I come here tonight. I am very glad indeed to meet some of the dairymen and men connected with the dairy industry of Illinois. By coming in touch with them and with men of like caliber, it is the only chance I see of getting new ideas.

Under our new dairy law in Michigan, it is the duty of the Dairy and Food Commissioner to foster the industry of the state, and under this law we have begun this campaign that I have mentioned here. I am frank to say, if I had the arrangement of this program, I would have selected a different time for this particular subject, or a different subject for the evening, but I was brought

up to do the things people expected of you and do the best you could.

Selecting and breeding dairy cows. I believe it to be one of the most important branches of dairying. When we consider that at St. Louis, in the dairy test there, that the cost of feed between the best and poorest Jerseys amounted to a little over \$2.00. I don't mean the cost of production, the value of the product amounted to but little over \$2.00, which would cost \$25.00 as a difference in feed, and the same rule not only held with the Jerseys but the Holsteins and with the Guernseys and every other breed on exhibition there. It seems to me that anything that can be said or done that will encourage the dairymen to put some system in operation on his farm which will enable him to select out the poor cows from the good, will be of great benefit to dairying.

I want to apologize to you for not being prepared with a paper upon this subject. I have here just a few notes that I must talk from, and I am afraid that I cannot do the subject justice.

The value of a dairy cow depends on three things. First, the quantity of milk she yields in a year, or during her period of lactation. Second, the percent of butterfat and other solids which she puts in that milk, and, third, the cost of keep.

We have given up the idea that we can select profitable dairy cows by their form. We make mistakes when we select them by their form. I will admit that we can go into a miscellaneous lot of cattle and select the beef cows from the dairy cows, but when you have divided them into these two classes, then I don't believe we are wise enough to go into a herd of dairy cows and select out the profitable from the unprofitable. I heard an illustration of that. C. B. Smith of the Michigan Agricultural College, you probably knew him. He is a practical dairyman, brought up on a farm in New York state. He came down to my farm at one time. We went into a back pasture to look at some Jersey heifers. I said to him, "Pick out the one that will make the best cow." He shook his head and said, "I can't do it." "Two or three years ago I could have done it, but I don't know

so much now." However, that is the way with all of us. We don't know so much about the looks of a dairy cow as we did a few years ago, but why shouldn't we expect that there is a difference in dairy cows? We can look over the other animals and find the difference. Horses are not capable of performing the same labor. Men are the same way. We make mistakes when we pick them out by looks. Many a poor fellow is mistaken when he picks out a wife by looks.

Since the invention of the Babcock test, we have a simple, effective and accurate way of determining the value of a dairy cow. It is because of the invention of that wonderful test that Smith had come to the conclusion that he did not know so much and that is the way with all of us. When you do not know whether your judgment is correct or not, then we stick to a theory and argue about theory, like the philosopher who argues whether a fish put in a pail of water would increase the weight of the water. They argued and argued the subject, and finally asked the opinion of a man with a practical turn of mind. Take away the water and weigh them and find out. That's the way we are settling the value of a dairy cow. We are simply finding out without any question as to what she can do, and fix the value upon her product. In the same way, we want to know how much a dairy cow will give in a year; not the amount in a day or in a week, or even in thirty days. We want to know how much in a year, 365 days, or during a period of lactation. We have got to feed her that time. I say the quantity of milk, simply the quantity, does not determine the value. We must know how much solids, and especially how much butterfat she puts in that milk. We want to know the other solids as well as the butterfat, but we know that there is almost a fixed ratio between the other solids and the butterfat. If we determine the butterfat we know about what the other solids are.

We have got to find out how much to keep a dairy cow on. There is a question that is a stumbling block to the average dairyman. He will allow that he can weigh the milk of a cow during a period of lactation and keep a record of it; allow he



can test that cow for butterfat two or three times during that period, but when it comes to talking of what she eats, that is a different proposition. Yet it is a practical question, and a question that will not give value to the other two, unless that is determined.

In weighing the milk of a dairy cow, it is better to weigh the milk of each milking during the period of lactation, not necessary for practical purposes, however. If we weigh the milk one day in a week, night and morning, pick out the same day in the week, Thursday we will say, and weigh the milk again morning and night, and make a record, you will find out a close approximate of the actual amount of milk she yields. If you think this isn't so, you take the records of your experiment station at the university, and select out Thursday, or any other day, and multiply by seven and then get the total through, you will get very close to the actual yield of the milk. Take any of them and do the same thing. One day in each week, for practical purposes is all that is necessary to weigh the milk of a cow so you can determine her real value as a producer. I know men who weigh once in ten days, and it works very well. They prefer to multiply by ten than seven. If you are afraid you will forget the time, make out a table and hang it in the dairy stable, and that tenth day you weigh the milk. You will find out you have a close record to pick out the poor cows from the good ones.

In testing for butterfat, we can't test one milking of a cow during a period of lactation and multiply the yield of the milk produced in a year by that and select out our best cows, because cows vary in the percent of fat. We have got to have an average so we can make a proper estimate. In the early part of the period of lactation, cows do not give quite as rich milk as they do later on. During the latter portion of the period they give better milk. At least test three times during period. Once when they are fresh, once in the middle, and once towards its close. Cows vary from one milking to the other, and we ought not to risk a sample from a single milking. Have a composite sample. Take samples from four consecutive milkings for one composite sample

and test them. If you do that three times during that period, and get the average, you will have a close approximation.

I find that a great many people do not take samples of milk correctly. In our creamery work we find quite a few who are not careful in taking samples. If a man milks a cow and takes a small amount from the top of the pail, that is richer than that at the bottom of the pail. From the time he began to milk the cream began to rise to the top and the layer at the top of course is richer. It is not right. It might be profitable for you to fool the creameryman, but don't fool yourself. Get an accurate sample of milk if you can. The best way is to have two pails and when through milking, turn from one pail to the other, and turn it back and forth, and get a sample of milk. That will be more correct.

In estimating the cost of feed for a cow, the farmer cannot afford to weigh the ration every day for every cow in his herd. If there is anything in this world that I pride myself upon, it is on being practical, and I believe it would be no sense to tell the farmers to weigh the feed of the ration of each cow separate every single day. They could not afford to do it. That is something they would leave to our dairy schools and to our experiment stations, and we pay the taxes to support them. But the farmers can make a close approximation. You know about how much hay you feed every day. You can take that feed of hay and put it in a sack and weigh it. You know how much of the other roughage part of the ration, and you can take these and weigh them. And how much grain you feed, or you ought to, and you can weigh that. Every time you change the feed materially, you simply make this estimate again, and you can come to a close approximation of the feed for the dairy cow. We then have something to base intelligent breeding upon.

Selection goes hand in hand or before breeding. It is not good business judgment to attempt to rear the offspring of unprofitable cows. We want to select out the unprofitable cows and raise progeny from the profitable ones if we wish to increase the quality of the herd.

I have started in selecting cows. It is a simple matter. A farmer can do this, and ought to do this in his herd. Every since the invention of the Babcock test, people have advocated this advanced dairy work and the farmers have been asked to put this system in operation on the farms, it is talked from the agricultural platform and through the agricultural press. I am more acquainted in Michigan, and we have some systematized dairy communities and hold meetings. I have asked audienecs for those who practice this system of selecting to hold up their hands, and you would be surprised to know that in a dairy meeting you could count them upon the fingers of one hand who put this system in operation on the farms. I do not know why it is. They believe it is too hard work and something they can't do. Any one can do it. Any one can run a Babcock tester. Some way, the average farmer don't start the machine. Lately, I have made up to my mind there is a better way to do this. Maybe the Danish people have got at the right method in testing and selecting dairy cows. You know that several years ago they began a system of this kind. I heard it from a young man from Denmark, an official tester, and I take his word for it. The government became interested in this question. They conceived the idea they first could get the majority of the dairymen there to put in operation this system of testing upon their cows, and if they got any good out of it, that it must be through co-operation. They began to organize co-operative cow testing associations in Denmark eight years ago. The little kingdom of Denmark is about one-fourth the size of Michigan—I don't know about Illinois. In eight years they have organized there, and have in operation over 400 co-operative testing associations. The idea has taken well. If we believe men who have been there, we can't help but believe it would be good to bring that system across the water, and have it in America. People tell us, that on the average the profit in Denmark, from this test system, has been increased 75 per cent. In numerous instances individual increases have been 100 per cent.

Up in Michigan the Dairy Food Department believe they

could do nothing under the dairy law, the same under the new dairy law which would better encourage dairying than to advocate co-operation. At a meeting of our State Dairymen's Association up at the little town in the northern part of Michigan, this subject was discussed there. The people up there seemed ripe for something of the kind. The secretary of the meeting appointed the time and I believed it a practical idea, and I believe that we can do something at Fremont. A short time after that, in September, we received word from the people up there, asking for some one to assist in organizing a dairy test association. They appointed an inspector who had had practical work in this system and who went up there two days and organized the first dairy test association in America. Since that time another one has been organized at my home town, but there is one in practical operation in Fremont. They were fortunate in getting a man for official tester who had been in Denmark, a Norwegian. The dairy food department asked that a record of the proceedings and of the work of each one of the associations be filed in the department at Lansing. They have agreed to send inspectors whenever they can be helpful. The other day, when I was in the Dairy and Food office, the records from this association at Fremont came in the office. I was interested in it. It was compiled largely from copy used in Denmark. In one particular herd up there the man had figures of test of cows, weight of milk, estimate cost of feed, and had figured out the cost of the production of a pound with each individual in that herd. I remember but two of them. One cow was producing butter for 11 cents a pound, and another cow in the same herd was producing butter at 45 cents a pound. It is very evident to me, I would rather buy a heifer calf from the cow capable of producing butter for 11 cents than the one at 45 cents a pound.

In this question of breeding, I presume I am taking too much time. You don't know where to stop on these subjects. I will make this short, there is something good ahead. The great law of breeding is that "like begets like." There is another, a notion or maybe a law. A great many practical breeders believe

that the daughters have the characteristics of the sire, and the sons of the dam. I believe that ought to be put down. We ought to know these things in our work.

The first proposition to consider is the mother cow. You know how they go to work to select the beef that contains the largest percent of saccharine matter, and to keep on increasing the percent of sugar. The same principle holds true of the mother cow. We want the best we can get for production. Our record association of pure bred live stock are making a mistake in registering everything, because pure bred. They should simply register those that have proved themselves worthy by their records, then we would have more rapid advancement.

As I say, we want a producer for a mother cow. We want one that has constitution enough to make splendid record, one that's got constitution enough to make more than one such record. I tell you that the dairy cow that can make a good record this year and next year and year after year, until she gets to be an old cow, is the kind of a cow that we want for the mother cow, if we can get her. Her progeny will be better performers than one who makes a good record for a short time, and then gives out.

This mother cow should have the dairy type. Put in operation this system of testing before you begin to breed, and you will not have very many that haven't the dairy type when you commence to breed. That will cull them out.

There are a great many qualities that we will not take time to dwell upon. But one quality, she should have a good disposition to be gentle. I believe more mistakes are made along this line with the mother cow. We have got so we judge a dairy cow by her performance. What can she do? That largely determines her value.

We work on a different principle on the dairy sire and don't know why we should. Pedigree and looks, and then we trust to luck for the balance. I believe the dairy sire should be tested in the same way as the cow. If he produces heifers that are satisfactory, then he is valuable, if not, he is worthless, and it is



the only true test of the dairy sire. We cannot determine his value as readily as the dairy cow. That's where the trouble comes in. The only way to do it is to take that new sire and breed him to only a few cows, until we determine his value. It never pays to take a new sire and breed him to the whole herd. You do not know the results. You are undoing the work of years. I say, take a new sire and test him. You have got to wait until he is four years old before you know his value. After arriving at maturity, breed him to a few cows, and lay him on the shelf until the heifers come fresh. Then, and then only, can you tell the real value of a dairy sire.

He ought to be well bred. He ought to come from the splendid dairy cow. We have got to test him. We must select him by his breeding and his individuality and then test him. The farmer who follows the practice of breeding to young sires exclusively will never make very much advance in breeding. We know also that some of the best dairy sires in every breed have been slaughtered before they knew their value. When they traced back the pedigree of Burgess and looked for the sire, they found him hung up in the shambles. Some one had got through with him and killed him. He was worth—why you could hardly find his value in money that he would be worth to the Jersey breeder had he been preserved. I say we make a mistake when we don't judge the dairy sire by the dairy cow. It is impossible with a small dairyman. If there are some small breeders, let them co-operate with their neighbor. Let a neighborhood co-operate together and select the best dairy sire and breed him to a very few cows, and lay him on the shelf until they find out his heifers. When you find one that gives satisfactory results, then you can't keep him too long.

I have simply given you here briefly some safe rules for select breeding that are arrived at from experience, observation and study. They must also be backed up by feeding and care. You can't develop experience without proper feed and care. It is absolutely impossible. And, besides this, while we can put down all the rules that experience seems to indicate that are

necessary for the breeding and development of live stock, there are very few real breeders. There are very few men who have taken and bred live stock and can say that they have actually improved the individual. A great many have taken to breeding of live stock, and when they were through with them, left them inferior to the ones started with. They perhaps followed rules of breeding as good as I have laid down to you.

I wish to mention, as a closing thought, that a man to be a real breeder, a real improver of live stock, must have something besides rules to follow. He must have that rare quality of being able to select out individuals that will produce desired results. Everyone hasn't this quality. Only a few men in the history of the world have been real improvers of domestic live stock. We can't all do that, but we can follow safe and sensible rules, and hope for practical results.

I thank you.

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#### ADDRESS.

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By S. B. Shilling, President Iowa State Dairy Association and President National Dairy Union.

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Mr. President, Ladies and Gentlemen:

I will confess to you that I feel very much in the air. I do not know just how to talk to you. I do not know the conditions surrounding you here, but surrounded as I am by all the appliances and the apparatus and everything in the rear to make butter and by this magnificent audience in front of me, a man ought to be able to make a pretty good speech.

I was over in Missouri two or three weeks ago—Jones was there too—we were invited to go over there to tell them how we showed up in the dairy districts of Illinois and Iowa. I never talked to Jones about the matter, but owing to the lack of attendance, they had some poor material for dairymen. I told them a story over there, and, of course, I didn't dare tell it about

Missouri, I told them it was in Illinois. It was supposed to have originated and taken place in Illinois. It was about a little child whose parents had been engaged in farming and in the dairy business and they had increased the value of their land to the extent that they thought they could sell at a very large price and go into Missouri and buy more land. In her evening devotions of the night before, after she had thanked God for the many blessings he had sent them, and after commending her little play-mates to His care, she said, "And now good-bye God. We are going over to Missouri." I tell this story. It seems to me to fit.

Now I never made a dairy speech in the middle of a convention, but that it would all be shot to pieces before I got a chance at it. I am not going to talk on the dairy questions. Those subjects will bear telling to you two or three times I know and then some. In Iowa, we tell it at every meeting. We try to impress them upon the minds of the people.

I take it you people in this county are just starting into the dairy business; not to any great extent yet. A meeting of these dairymen here should be good in the future to you. It looks to me as though you were interested in the subject. I don't believe in driving people into the dairy business. We were in the wheat business up there until we got so poor, we didn't dare go to town. If we went to town, we went on the back streets because we owed every grocery there, and were driven into dairying. It has proved a God-send to us in the end. It is the best business we ever struck. We would never have engaged in this business, but we needed the money, and we have made money out of it. Instead of land being \$40 and even \$24 an acre, you have got to pay \$100 an acre. We have got to that through dairying. Our lands are more fertile today than they have ever been. Even with the lack of intelligence we have made money out of it. We are only in the early stages of dairying, and do not yet know the possibilities of the dairy cow, and what she is to us.

According to the last report from Iowa, it cost \$24.00 to keep a cow. The very best estimate \$21.00. In the whole state we are only making two or three dollars profit from a cow for a

year. It is no trouble for us to show individual instances of where farmers have received \$25, \$35, \$50, and up to \$75 as a net return from the milk of a cow. Think what it means to us. If every farmer in the State of Iowa, where we do nothing much but that, what it would mean to us. What it would mean to you. It is possible for them to do this.

I am glad Mr. Lillie gave you the first dairy test association in America. Great credit is due to Michigan. I saw a copy only the day before yesterday of the report of the meeting, and also of the constitution and by-laws from Michigan. We had to cut it all up to send it to the Chicago Dairy Produce. It means a great thing to these people. We have all got to come to it.

He referred to the record made at the different associations. I do not want to stand before you and tell you it is possible for us to do this at once. What I say is, that what is possible for them, is possible for you and me to do with an intelligent study of the question. Your success will depend on the amount of intelligence you put in the business. There is not a branch of farming today that requires the intelligence, the study, that will pay as well as the dairy industry if you put the intelligence into it.

Now when I was coming down here today it seemed to me there has been one part overlooked a little. I am going to make a rank statement. Brother Thurston and I were looking out of the car windows, and I said to him, We have seen feed enough since we left Chicago, out in the fields, gone to waste, to winter the stock of the State of Illinois, if taken care of. I am glad it was not so rank as I thought it was. I mean just exactly what I say. You are wasting feed enough in the corn fields, and leaving—here is another rank statement—as I said, enough feed to take care of the stock of Illinois in the corn you have taken off of it. There is only one way, the silo.

We have gone into the silo business, feed it almost entirely. I don't like to stand before an audience and say some of these things. I am a farmer myself all right, but such a poor one. My cattle are not Jerseys, they are all Short Horns. I wish

they were Jerseys or something else. I told Thurston, and while I don't want to advertise any breed of cattle, I do say this: I always believed there was not such a thing as a Short Horn dairy cow, and now I know it. I have given it up and I wouldn't ever advise you to try it. You cannot be a dairyman and have the Short Horn cattle as I did.

This silo, I want to talk a few minutes about it. I am feeding ensilage this winter to, I think, 53 head—50 or over. It is 100 head of hogs, 12 head of colts that I am carrying, 20 acres of corn in ensilage. My milk cows get something else, a grain ration. Of course, don't understand me I am feeding only this. I can take the horses and hogs mostly through without anything else. I expect I would be criticized, but I am doing that very thing on 20 acres of corn. I have got the most nutritious feed that it is possible to have. It cost 62 cents a ton to put in the silo. I know that because I am an old bachelor—don't tell that for advertising purposes—and have to hire everything done. I know just what that cost, 62 cents a ton to put that into the silo.

#### DISCUSSION.

Q:—What is it worth an acre?

A:—Not so much there as it is down here. It was probably worth from \$12.00 to \$15.00 an acre as it stands in the field. Take it as it runs, that may be a little high. Near \$12.00.

Q:—Make money on \$10.00?

A:—That's a question. Your lands may be richer than ours and don't have to fertilize.

Q:—I raise 25 tons?

A:—That beats me.

It is rich in corn; they plant just the same as going to huck. Nearly matured and leaves dead and in best possible shape. I can take my stock through without much else. I couldn't tell the story too big. I was told I must not let any of the hogs have it, and don't let milk cows have it, for it would spoil all of the milk. The milk has been used for starter ever since and never heard any complaint. I was asked if I let the hogs have it? I said yes they did and I never had as many pigs or as good ones in my life.



Colts have it, they asked. They said their teeth would fall out. I never had as good colts in my life as when I brought them through on ensilage.

I said it cost 62 cents and will tell you a little bit of a story. I am an old bachelor and will tell you how three of us built a silo. I have a neighbor over about ten rods from the house and I borrow all the tools he has, and he comes and gets them and never says a word. I also borrow from an Irishman there and he kicks a little, but I always go and get them again. And there is another one there just like myself, never got any thing to lend. I got the machinery that filled the silo. I want to make this statement to you. Just as sure as you get these corn crops you are going to come up against this silo proposition. You are going into the dairy business and going into something to increase your land more than anything else. When your land gets to a high price, it isn't worth it and you don't get it out. But by ensilage we are getting interest on our land where we didn't get it before.

Another question. Are we getting the right raw material? We are threatened with destruction to our industry from a foreign product, and I want to say to you today we are just as serious about the poor material we are turning out. That is an awful statement to make, but it is a fact. Today our markets are flooded with the poor product that is almost unsalable. There is not enough good product to go around. Let that soak in. You are never going to see the day you can take the entire output of good product and have too much. You never can overdo the dairy business. The whole thing is right upon the quality of the product.

But my story; it is on myself. This is not a new thing. The raw material. I am an experienced butter maker. The same thing impressed me then. It was necessary for me to do something about the milk. So I went with the driver and tried to get better raw material. I was young then. I am telling you this to impress on your mind to get a better raw material. In my green state I thought I had a little knowledge of human nature.

This story I am going to tell you, it was five or six years before I could see any fun in it. It was a very delicate matter with me indeed. The very first place I went into was an Irish woman's. I walked into the kitchen and went across the room and sat down, and the first break I made settled it. I put my hat on the table and commenced. I said "The cream you are sending to the creamery is absolutely rotten." Yes, I got out, but that happened twenty years ago and my hat is there yet. I do want to put this strong to you; if you put intelligence into it the way you ought to, nothing will pay better in your life, but you must get a good raw material. You can't be too particular. The better you make it the more will be consumed.

I want to talk on another question, and leave it with you. The work of the National Dairy Union, of which I am the president. I want to say to you a few words on the subject. I shall give no history of the work, it is known to almost all of you.

Ten years ago an organization for the purpose of protecting the dairy interests was formed. It was to procure the prevention of a fraudulent sale of a product taking the place of butter in the markets of the world. At one time in its history 126 millions of pounds were sold, and ninety per cent of that was sold as butter. Had nothing been done, the material was unlimited; you can see where we, as dairymen, would have been if we could not have controlled it. We secured the passage of a law. After that it dropped from 126 million to less than 50 million pounds. The law was all we had hoped for. It accomplished more than we had supposed. Since that time it has been a constant struggle between the Union and the manufacturers of this product to get their product upon the market. I am going to cut the argument short, but I want to make a statement here. Very often the work of the Dairy Union has been misunderstood. We have been told we say it is not a reputable business. We have never taken the position, but claim that the manufacture of oleomargarine is as good as a dairy business is just so long as they sell it for what it is. That they must manufacture it and sell it for what it is, and not for our product. I am just going to bring up a few facts.

In the first place, the oleomargarine manufacturer has got the money to fight us. You know the Union secured a law and that it was under the supervision of the Internal Revenue Department. They are an overworked department today. The illegal sales became so great that we applied to the Internal Revenue officers to do something for us. We all know that at first the tax on oleomargarine colored as butter there was a tax of two cents, but that didn't last. We finally secured an amendment to that of ten cents on colored oleomargarine and one-fourth of a cent on the uncolored. In the city of Chicago the sales had reached to an immense amount. In there the wholesale sales shrank 281,000 pounds. In the city of Chicago a matter of 281,000 pounds less of butterine, to displace yours and my product of the dairy, so you see the results are everything we wished for.

The present season a modification of the present law has been asked for. They want to reduce the ten cent tax to four cents, or two cents. We have to fight it, for if they are successful in getting this modification it will mean a repeal of our law, and we are simply lost. The National Dairy Union is fighting this. We have a man in Washington looking after it. We reach from one end of the United States to the other. There is not a state in the Union but where we claim members, and it is so thoroughly organized, because we are strong enough to prevent them pushing anything through the congress without our knowing it. They have tried that, and it took just 30 days to hear from the dairymen of the country. We have got to prevent them from passing that law. The only protection we have is the simple fact we are organized and good and strong.

When you sell a pound of butter on your farm, you can think you are selling the only product that is protected to you by law. And I want to say to you, the National Dairy Union is the only organization for the express purpose of furthering any one particular interest that has been successful. The high prices you are receiving this law has given you dairymen and it amounts to millions of dollars a year. I don't have to ask you to pass any

resolution, for we know the Illinois State Dairymen's Association sympathize with our movement.

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Music by the orchestra. Encored.

By the President:—I want to impress on your minds tonight what Mr. Shilling has said about the National Dairy Union. You, of course, are looking to the condenser for your market, and while this law applies only to butter, I don't want you to think it does not affect the prices you would be paid at the condensing factories. The condensing factory authorities, in making their prices, they first make up their minds what the probable future butter market will be, plus the value of the skim milk you leave with them and a little more. It would affect your pocketbook as well as mine if they should win out in this fight.

By the President:—Your organization very kindly asked our Governor to be present with us. He first said he could, but we received a letter stating that his appointments were so numerous he could not be with us tonight, but has sent a very able representative, our State Food Commissioner, and under his supervision the dairy laws of this state are supposed to be looked after. I am very much pleased to see that Mr. Jones has looked into the dairy side of the work in his office the last year, and has given a good deal of time with his assistant, Mr. Patterson, to the work. We hope some day to have a real dairyman in this position. We will listen to Mr. Jones.

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#### ADDRESS.

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By Mr. Jones, Food Commissioner, Chicago, Ill.

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Ladies and Gentlemen:—I assure you that it is with great pleasure I appear before you this evening. When we take into consideration the wonderful possibilities of Illinois, and what she has done in the past 31 years, during the life time of the State

Dairymen's Association, and what I know has been done within the past six years during the time I have been State Food Commissioner and connected with this Association in trying to build up the dairy interests of this great state, I say, when we take into consideration these things, we can be proud of the work that the State Dairymen's Association has done and is still doing.

I had a talk some time ago with Governor Deneen in regard to the matter, and he thought he could be here in person and address this audience and tell them of his sympathy and his views since his advent into the office of Governor of this great state, and had tried to assist the dairymen in every way possible about the work of building up the dairy interests of the state.

When we take into consideration Illinois as she is, 400 miles long north and south, an average breadth 250 miles east and west, with not an acre but interested in the dairy business. And then take into consideration, my citizens, the states represented here tonight of Michigan, Wisconsin and Iowa and the pleasure we have had in listening from them. They have told us of the silo, what nature has done for them, and we have heard from Illinois and what has been done there. So, my friend Shilling, these gentlemen here, Mr. Lillie, in order to build up their state, have gone into dairying. Illinois, naturally, is a dairy state, and I take pleasure in working here in this great state of ours to see what has been done by the dairy.

Isn't it true, that we have not done as well in southern Illinois as up in northern Illinois. If we had got a Newman, a Gurler and men of that type who head this Association, and for the past six years before that, we might today have been in the front rank of the galaxy as dairymen in this great state.

Illinois is in the front. When the Secretary of this Association invited me to address them, he said about 15 or 20 minutes—25 or 30 minutes—I would like to talk a week, so you know what's coming, and for fear I would, have written down what I shall say. I have put in all my time enforcing the dairy and food laws of Illinois. There is nothing that ever engaged my time



that has given me so much pleasure. I wish each and every one of you would write to 1623 Manhattan building and get a copy of the next report and see what has been accomplished by the Commissioners the last year.

We took 5,000 samples of milk in all the principal towns of this state, and with the exception of the months of June, July, August and September, we have had a splendid quality of milk, but during those months in the larger cities some of the dairymen used formaldhyd. We found them trying to keep milk sweet and preserve milk. You want to put this fellow behind. "Get behind me, Satan," for it is nothing but formaldahyd, but some dread preservative, to doctor the milk and liable to kill the baby and ruin the stomach of those who are weak and infirm. This product of nature we want to preserve, but free from danger.

It is a great pleasure to meet this intelligent gathering of dairymen, gathered here from all parts of our great state on the 31st anniversary of the Illinois State Dairymen's Association.

Your attendance in such numbers, from all sections of the state, attests your zeal as well as your deep and growing interest in an organization having for its prime object the assistance and encouragement of useful education and object lessons among the dairymen of our state as well as the dairy resources of the state.

The city of Effingham is in one of the counties in Illinois where dairying should be fostered—the soil and climate in and around this beautiful city is peculiarly adapted to dairying and here is where dairying should be encouraged and fostered—in no other part of the state can developments and growth of the dairy interests do so much for its people as it can here in Effingham county. For this reason more especially is it fit and proper that this Association should meet here on this its 31st anniversary.

As State Food Commissioner of Illinois, I have had occasion to look up the dairy conditions of Illinois, and compare them with the dairy conditions of our sister states, and I am proud of Illinois, as by comparison she looms up and takes a first rank among them all as a dairy state—and comparing today with six

years ago we see that great changes have taken place in Illinois, over four hundred creameries and two hundred cheese factories have been built.

In the year 1905—just past—we had over 1,700,000 milk cows, one thousand creameries, twenty condensers and, according to the latest estimate, her seventeen hundred thousand cows brought in nearly sixty millions of dollars. This increase in the dairy industry of the state requires legislation for the regulation of the production, manufacture and sale of dairy products, and today the laws of the state, regulating the dairy interests of the state, are inadequate and many of them inoperative and are out of date, owing to the great advance made along all lines of the dairy industry of the state.

Uniformity in dairy and food laws in the different states would be very desirable; we are constantly annoyed by finding spurious goods throughout the state, and in many case they are labeled “pure”—the merchant has purchased them as “pure.” In such cases it would be unjust to punish the merchant, and the wholesaler, in many cases, are located in another state and cannot be reached. All due credit to the interstate commerce law, but it greatly interferes with our work, as any one has a perfect right to ship from one state to another any and all goods; thus we have no control of our manufactures or jobbers; we may go to their place of business and find goods that are adulterated, and if questioned regarding them, they have a ready reply that they are for export trade, probably Indiana or Missouri. There are so many wholesale manufacturing and jobbing houses doing business that it would require an army of inspectors on each side of the state to keep out all goods that do not comply with the State Food law.

If all the states had uniform laws we would not be imposed upon to such an extent, but consider Missouri on the west without a Pure Food Commission, or an adequate food law, and St. Louis, the largest manufacturing city of poor goods; it is not surprising that some of it finds its way into Illinois. It seems to me that the states not having a “pure food law,” must necessarily be the dumping ground for all spurious goods.

The educational feature of the dairy and food department greatly facilitates our work, where there is one merchant who desires to handle spurious goods there are a hundred who desire to deal in nothing but pure goods, and all that is necessary is to inform them of good and poor grades of goods in the market, and I assure you they will choose the best.

This work is done largely by the inspectors, who pick up all brands of goods not known by them to be either good or bad, which are sent to the state food headquarters, 1623 Manhattan building, Chicago, Ill., for analysis, the result of which is reported both to the inspector and for the merchant from whom the sample is taken, either in a bulletin or annual report. The analysis may also be published in the daily press, food journals and magazines, which are for the benefit of the merchants as well as the consumers of the various food products.

There is nothing the producer, manufacturer and jobber of spurious food products dreads so much as publicity. Our experience along this line has been satisfactory. If the goods do not comply with the law, and the merchant is informed of the fact he, as a rule, returns them to the wholesale dealer or labels them according to law.

Formerly great losses were sustained by creamery patrons on account of inefficient buttermakers and poor milk, which were in a great measure remedied by a system of field instruction. But notwithstanding all these difficulties, Illinois has gradually forged to the front, and leads all other states in the production, manufacture and sale of dairy products.

It is hardly necessary for me to state that Illinois stands at the head of all other states of the union in the production, manufacture and sale of dairy products. Her broad, fertile prairies, in the northern and central part of the state, her hills and valleys, in the southern part, are alike conducive to this industry. We are apt to forget, as Illinoisans, when we eulogize and speak in praise of her wonderful growth in agriculture, commerce, population, education, wealth and all that goes to make a state great

and powerful—I say we are apt to forget that she stands one of the first in the galaxy of states as a dairy state.

We are apt to forget that within her confines is the Elgin butter board that fixes the price of butter, not only here in Illinois, but in the entire Middle West. That situated as she is, almost mid-way between the great oceans, Illinois has a commanding influence in controlling the dairy markets of the Middle West, and Chicago, being the Empire City of all this vast country, located on Lake Michigan as she is—Illinois and Chicago—when measured by time and performance as to production and trade in dairy products, not only as to quantity but quality, lead the markets of the civilized world.

I feel complimented also by having Illinois called a dairy state, because I know and you know that those states where the dairy interests are the largest are the most powerful and prosperous. You go into the counties of Illinois which are largely dairy counties and you find the average value of farm lands has almost doubled by reason of their industries. Go into the counties and you find the farms in good condition, with good barns and good houses and that the mortgages are pretty scarce among those people.

It has been my good fortune, as Dairy and Food Commissioner, to live in a state where the people are learning to comprehend and understand the character and value of the dairy interests.

A good deal of our development in the dairy industry has been due to the State Dairymen's Association. I am going to refer to this because I suppose you want to know what it is that has made Illinois one of the first dairy states in the union.

It so happened that about thirty-one years ago the State Dairymen's Association was organized. Its members went at it not for the purpose of placing themselves before the public, not with any political axes to grind, but to see what they could do

to make the Illinois cow a better cow, to make Illinois milk better milk, to make Illinois butter better butter, and to make Illinois cheese better cheese.

For thirty-one years the association has been working along those lines. The result has been that the Illinois cow is a lovely animal. She is the Dairy Queen and her milk and butter is declared the best.

This association grew to be of such value that it was the subject of universal comment throughout the state. Out of its meetings grew the Illinois Farmers' Institute, established July 1, 1895, and they furnish another agency for the better education in our state. We hold now one hundred and two, or one in every county in the state every winter.

Practical men—not simply men who talk—but men who know, go to the Institutes and instruct the farmers in their business, and do not waste any time talking about politics. They talk about cows up there and milk and what is required to make farming successful and better farmers.

This organization has been behind the dairy and food laws of our state. One object of getting the State Food Commission was to enforce the dairy and food laws of the state; another object was to have an organization in the state whose business it should be not only to enforce those laws but to ascertain as far as in their judgment and experience would go, what laws were required.

The real foundation of the whole dairy business lies in the milk producer. The chief necessity then in improving the dairy condition is to give the producer such knowledge of the right methods of handling and caring for the milk that he will not only see the necessity for such methods, but may also know how best to accomplish this purpose.

The condensing factories have been the greatest factor in raising the standard of milk production upon the dairy farms of Illinois. They make certain requirements in regard to the meth-



ods used in the production of milk delivered at their factories and have inspectors to see that rules and regulations are carried out.

In discussing the dairy industry of Illinois it is necessary to consider it in the different branches. There is probably no phase of dairying in our state today that is receiving such close study or making such active progress and improvement as that of market milk, if we may so call it—the supplying of our cities and towns with more and better milk. This, of course, is felt chiefly in the more thickly populated portions of our state, where towns and cities are growing rapidly and the work that is being done in this branch of dairying is also growing rapidly.

The production of condensed milk in various forms is increasing fast, and this commodity is being exported in increasing proportions over all other of our dairy products, and there is evidence that there will be a steady increase in the manufacture of condensed milk in Illinois on account more especially of the large demand for export.

The export of condensed milk during the last ten years has been remarkable—our condensaries furnish our army and navy largely with their supply of milk and cream and during the war between Japan and Russia it was shipped in large quantities to supply the armies of Japan and Russia, as well as to all other parts of the civilized world. Illinois has the largest condensed milk plant in the world at Dixon, and new plants are in the course of construction.

The experience and observation of the Illinois State Food Department has shown that every year during the past six years that the general public have taken greater interest in the production of clean and sanitary milk. It is a focal point of most dairy legislation and is the most essential item in dairy manufacture and milk condensaries.

Dairy and food inspectors, city boards of health and state dairy and food inspectors are active all over the state in the work of improvement of the sanitary condition surrounding the production and manufacture of milk and milk products.

Reports from these various officers, manufacturers and condenseries show that one of the greatest obstacles in the way of securing improvement is the dairy barns in which these herds are kept. Too often these dairy barns are found to be damp, dark and poorly ventilated; the floors are a source of everlasting odors; the lack of sunlight promotes the decomposition, and every particle of dust is loaded with germs which readily find their way into the milk. The foul odors present are absorbed by the milk before it can be removed from the premises. The cows are more susceptible to disease and the place, owing to its unsanitary condition, is entirely unfit for housing animals.

There seems to be some excuse for this condition of things, as many, if not most, of these dairy barns are built before the necessity of light and ventilation, good drainage and sanitary arrangements for the interior, were as well known as they are today. Most dairymen realize this fact and would make improvements which are not necessarily expensive, if they knew how to go about it. Many excellent dairy barns have been built in different parts of the country and great improvements have been made in dairy herds, and the milk supply of the state is far superior today to what it was at any time during the past, as the dairymen of the state, through these meetings of the State Dairymen's Association and similar organizations throughout the state, as well as the work that has been done and is being done in the Department of the Dairy Schools at the University of Illinois, and as a result of this educational feature the dairy products of the state are in better condition and more wholesome than ever before in its history.

The reputation and standing of Illinois as the leading dairy state is in the hands of the dairymen of the state and as long as they honestly strive to produce the best milk for the consumer, the condenseries and the cheese factories of the state and see to it that the milk product is kept clean and wholesome, Illinois will always retain her position as the first dairy state in the union.

In conclusion, I want to congratulate the State Dairymen's

Association of Illinois on the good work they are doing in holding up the banner of pure and wholesome dairy products as well as encouraging the growth and development of the dairy industries of this great state, for there is no other organization in such close touch with all the people of the state and in which all the people are more interested than in those of the dairy—for from the cradle to the grave every one of the five millions of people of this great state of ours is dependent upon the dairy industry and the production, manufacture and sale of pure and wholesome dairy products, and I sincerely hope that our next legislature, in its wisdom may see the necessity of helping the dairymen of the state by giving them suitable legislation, as well as inspectors to look after the dairy interests and funds sufficient to advertise and publish to the people of the state as well as of the civilized world the great work that is being done and carry it on by the dairymen of the state.

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Vocal solo, Miss Ruby Bissell. Encored.

By the President:—The Secretary will now read the butter scores scored by Mr. Carl Lee of the University.

By Mr. Caven:—A woman made the highest score on creamery butter, Mrs. Alice Cooksley, of Stillman Valley. She does all the work connected with the making of butter, and her husband takes charge of the milk. Her score is 97.

(Reads scores.)

By the President:—Our butter room will be open all tomorrow forenoon for any one who wishes to examine it.

A Member:—What will the lady's premium amount to?

A:—Mr. Caven:—I can't tell exactly. We will have to ascertain first of Mr. Youngs, the owner of the creamery is a member of the Elgin Board of Trade. She will get the gold medal offered by the Elgin Board of Trade for the buttermaker making

the highest score at the State Dairymen's meeting. She will be entitled to that medal which is the only special premium the Association allows. As to just what value in money her score will be to her, I can't tell yet.

Q:—There are premiums of salt and coloring, are there not?

A:—No; in scoring butter of course the salt and color are points considered in the scoring. There is nothing special for those points.

Piano solo, Miss Jennie Truesdale. Encored.

By the President:—The railroad certificates left today are all ready to be delivered. If there are any others to be fixed, leave them at the Secretary's table to receive attention.

I call your attention to the class in testing tomorrow morning on this platform by Mr. Lee of the State University at 9 o'clock; from 9 to 9:30, bring in your samples and have your class in testing right in Effingham tomorrow morning. From that you can form your own class later on.

We have a few more of last year's report, the same as we are getting this year. If any one would like to have one, please step up and get it.

The Chairman of the Banquet Committee would like to give a notice at this time.

Mr. Chairman, I am requested to announce in behalf of the Commercial Club of Effingham that at the close of the Association meeting this evening, you are invited to a banquet to be given at the Armory Hall, one block and a half east to the Court House on Fourth street. I hope none of you will be so thoughtless to go without your appetites. The ladies there will serve at the tables.

Mr. Newman:—A notice of that kind is best acted upon at once. We will adjourn to the banquet.

Don't forget the testing class in the morning at 9 o'clock.

## Thursday Morning, January, 18, 1906

Convention called to order.

President in the chair.

Is Mr. Lee in the hall? Yes.

We will come to order and hear from Mr. Lee of our State University. His paper will go in the records, but he wishes to tell you a few things.

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### THE HANDLING OF SEPARATOR CREAM.

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By Mr. Carl Lee, Urbana, Ill.

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Mr. President:—I am sorry in one sense that the work is not one that will be of such interest to you.

There is not a problem before the dairymen, creamerymen, commission merchants and the consumers today that should attract more attention than the improvement of the product made from the hand separator, or gathered cream.

A few years ago very little was said by anyone regarding the quality of the butter put out by the Illinois creamerymen. It was acknowledged that a number of them were putting out butter that would pass above the extra mark and that here and there was a creamery that would occasionally pass below. They never inquired into the details of the work because a small amount of an inferior product could be handled. No questions were asked by the commission merchants as to whether the butter was made from whole milk or from gathered cream. Today we find that conditions have changed. The consumer calls for a better grade of butter and nothing but the best will be accepted. Commission merchants want the best, but are often compelled to take what is not just up to standard. One thing is true, the centralizing system is increasing and the number of whole milk patrons are



decreasing and unless something is done to improve the product, the people will be compelled to eat a poor grade of butter.

Not long ago a merchant handed me a one-pound print of hand separator storage butter. It was neatly done up in a wrapper bearing the name of the manufacturer, and I am thankful to say it was not an Illinois product. The merchant wanted to know what was the matter with the butter. He said, "People will not eat it."

A short time ago a speaker in one of our sister states boasted of the following fact: "A few years ago Illinois made the best butter that was made, but today the buyers of the East pass Illinois up and call for our product." Is this true? If so, it is time that something is done. Being in a position to know, I would like to state that the butter made in our best whole milk creameries is equal to the best butter made in any state and that our so-called hand separator butter is not scored off the market any more than the butter made from the same grade of cream under similar conditions in our sister states. But we must have the co-operation of creamerymen, buttermakers and farmers, and a similar disposition existing towards those who are in position to aid and distribute the information that will help improve the dairy conditions.

Recently it was my good fortune to score the butter at a county institute. Over fifty samples of butter entered the contest and all of them were made in dairies scattered throughout that county. It was a good lot of butter, representing study, care, skill and advancement, and showed what could be made out of the milk skimmed on the farm.

What is this subject that I am to discuss today but taking this same cream, delivering it at one plant and making it into one lot of butter?

The care that the cream receives while it is on the farm plays a very important part as to the quality of the butter. In one sense under present conditions we might say that the farmer is the man that ripens the cream; for it is often the case that the cream contains all the acid that is necessary when it reaches the creamery.

If acid is what we are working for, all right, but we are after flavor and in order to get that rich, creamy flavor in our butter we must have the cream in good, clean, sweet condition.

The buttermakers in our smaller creameries can do a great deal toward getting the farmer to take proper care of his cream; while the buttermaker in the larger centralizing plants can do nothing but make butter and plenty of it.

Here are a few things the buttermakers should know and explain to the farmer:

Barns should be kept clean.

Milking should be done under the best of conditions.

Milk should be removed from the barn to the milk house as soon as possible after the milking is done and separated while it is warm. The cream should be cooled as soon as it is removed from the milk and warm cream should never be mixed with cold cream.

The cream should always be delivered while it is sweet, four to six times per week in summer and three times in winter.

The farmer should skim a rich cream, from ten to twelve pounds per hundred pounds of milk. The creamery does not pay anything for the skim milk that is in the cream. A small amount of cream can be handled to better advantage than a larger amount and there is less danger of the richer cream becoming sour. That cream, varying in per cent of fat from 30 to 45 per cent can be handled to a better advantage by both farmer and creameryman.

The separator must be handled as follows:

Read the book of instruction sent out by the separator firm. Insist on the separator and all the utensils that come in contact with the milk being cleaned every time they are used.

One of the reasons why so much poor cream is delivered is because the farmer has not a suitable place to keep it.

The following plan has worked satisfactorily. It requires an oil barrel burned out, placed in the milk house or between the pump and the stock watering tank. Between the first and second

hoop drill six or eight one-inch holes at equal distances. Just below the second hoop drill one  $1\frac{1}{2}$  inch hole. The water pipe from the well to enter at this point. On the inside of the barrel place a wooden trough to carry the water to the bottom of the barrel. In the side of the barrel, next to the water tank and above the third hoop, drill a two inch hole and connect this with a pipe to carry the water to the tank. A tight box can be used in place of the barrel. An arrangement of the above description will hold all the cream produced upon an average farm and the cream will be in fairly good condition for a four day per week delivery—providing that all the water needed for the stock has been passed through this barrel.

We often underestimate the importance of frequent deliveries. The average producer of milk has not the facilities to keep the cream more than three days and even then in a number of cases the cream is not in a fit condition to be made into butter of good quality. It is true that the cost of getting the cream to the creamery must be considered, but it should not be done at the expense of quality.

As a rule the best results are obtained when the cream is delivered by the producer or when several patrons in one community take turns in delivering the cream. When this method cannot be followed and the cream cannot be shipped by rail, do the next best thing, that of collecting the cream by means of the regular cream haulers. The men in charge of the wagon should know the grade of cream desired. He should be a man that would treat all farmers alike and if he found a few of the farmers were not taking proper care of the cream, he should be able to give them a little friendly advice.

The most satisfactory method of handling the cream on the wagon is in the 30 gallon jacket cans, fitted up with floats. The wagon should be covered and fitted up with springs.

The driver should be furnished with a scale with a removable cover, a stirrer, the base being of heavy rubber, to be used to scrape down the cream from the can. The hauler should not rinse out the farmer's cans with water. Have one small dipper,

a hook with the patron's name and number and a sample case to hold enough bottles to have one for each patron. These bottles should be the heavy one by five inch tubes in place of the long nine inch tubes so frequently used. They hold more and are easier to fill and empty.

Make regular trips. Call on all the patrons, except when they have told you they would churn. Never fail to call for the cream because the patron has a small amount and thinks he can hold it until the next time. One gallon of off flavored cream will spoil several gallons.

Weigh all of the patrons cream in your own pail.

Do not take out the sample for testing until you have weighed and thoroughly mixed the cream. Fill sample bottle.

Be sure your sample bottles are not mixed and that each patron is credited with the correct amount of cream.

Start early and do not stop longer than necessary.

One of the essential things that a man in charge of a hand separator creamery should know thoroughly is the butter fat determination or cream testing. This is often the cause of a great deal of trouble, especially in neighborhoods where the farmers have not the confidence in the buttermaker and where unfair competition has been practiced. No one is free from mistakes, but mistakes are more apt to occur when the work is done carelessly.

The system of testing cream every time it is delivered is probably the most satisfactory if plenty of time is taken, but when a man has to crowd in fifty to one hundred samples a day after the other work is done he cannot give it the time it requires.

I would prefer to see a system for determining the total amount of butter fat delivered by a patron for a week or fifteen days by the use of the composite sample. In that case only one fat determination would be made instead of four or several. A number of farmers cannot understand why their cream varies from day to day. They do not consider that there are various causes for variation in test of cream; such as changing the speed of the bowl, temperature not always the same, more milk going

into the bowl one time than another and a variation in the amount of water or skim milk used in rinsing out the bowl, etc.

By the use of the composite they would not have as many tests to compare.

Sufficient work has been done to show that an accurate determination of butter fat delivered can be done by the composite system.

The following tables show the results obtained by testing cream every time it is delivered, as compared with the test of a composite for the same period.

TABLE A

| Patron's Number | No. of Deliveries | Total lb. Cream | Ave per cent fat | B. fat from every day | Per cent fat composite test | Total B. fat from composite test |
|-----------------|-------------------|-----------------|------------------|-----------------------|-----------------------------|----------------------------------|
| 1               | 4                 | 480.5           | 34.86            | 157.07                | 37                          | 177.79                           |
| 2               | 4                 | 142.5           | 40.9             | 58.30                 | 41.5                        | 59.14                            |
| 3               | 6                 | 276             | 31.47            | 86.88                 | 31                          | 85.56                            |
| 4               | 4                 | 159.5           | 39.13            | 62.41                 | 39.5                        | 63.00                            |
| 5               | 4                 | 112.5           | 37.81            | 42.53                 | 38                          | 42.75                            |
| 6               | 4                 | 99              | 37.12            | 36.75                 | 37.5                        | 37.13                            |
| 7               | 4                 | 118.5           | 39.67            | 49.67                 | 41                          | 48.59                            |
| 8               | 4                 | 404.5           | 27.32            | 110.46                | 28                          | 113.26                           |
| 9               | 3                 | 177             | 34.83            | 61.65                 | 33.5                        | 59.30                            |
| 10              | 4                 | 284.5           | 35.94            | 102.26                | 36                          | 102.42                           |
| 12              | 4                 | 158             | 24.75            | 39.11                 | 24.5                        | 38.71                            |
| 13              | 4                 | 59              | 31.05            | 18.32                 | 32.5                        | 19.18                            |
| 14              | 4                 | 130.5           | 32.35            | 42.22                 | 33                          | 43.07                            |
| 15              | 4                 | 178.5           | 35.08            | 62.63                 | 36                          | 64.26                            |
| 16              | 4                 | 193             | 28.26            | 54.58                 | 29                          | 55.97                            |
| 17              | 4                 | 161             | 35.73            | 57.51                 | 34.5                        | 55.55                            |
| 18              | 4                 | 130.5           | 28.55            | 37.26                 | 30                          | 39.15                            |
| 19              | 4                 | 111.5           | 33.60            | 37.46                 | 34                          | 37.91                            |
| 20              | 4                 | 40              | 37.99            | 15.19                 | 39.5                        | 15.60                            |
| 21              | 3                 | 62.5            | 30.67            | 19.17                 | 29.5                        | 19.75                            |
| 22              | 2                 | 9.5             | 32.84            | 3.12                  | 33                          | 3.14                             |
| 23              | 4                 | 127             | 35.21            | 44.72                 | 34.5                        | 43.82                            |
| 24              | 4                 | 134             | 30.12            | 40.37                 | 29.5                        | 39.53                            |
| 25              | 4                 | 60.5            | 29.83            | 18.05                 | 29.5                        | 17.85                            |
| 26              | 4                 | 57              | 25.87            | 14.75                 | 26.5                        | 15.11                            |
| 27              | 4                 | 167.5           | 34.68            | 58.10                 | 35                          | 58.63                            |
| 28              | 4                 | 240             | 27.46            | 65.90                 | 27.5                        | 66.00                            |
|                 |                   | 4,310.5         |                  | 1,394.37              |                             | 1,435.39                         |



TABLE B

| Patron's<br>Number | No. of<br>deliveries | Total lb.<br>cream | Ave. per<br>cent fat | B. fat from<br>every day | Per cent fat<br>composite<br>test | Total B. fat<br>from com-<br>posite test |
|--------------------|----------------------|--------------------|----------------------|--------------------------|-----------------------------------|--|
| 1                  | 5                    | 492.5              | 32.63                | 160.75                   | 32                                | 157.6                                    |
| 2                  | 5                    | 190.5              | 38.86                | 74.03                    | 39                                | 74.30                                    |
| 3                  | 7                    | 308                | 34.18                | 105.31                   | 34.5                              | 106.26                                   |
| 4                  | 4                    | 146.5              | 35.75                | 52.38                    | 36.5                              | 53.47                                    |
| 5                  | 5                    | 163.5              | 27.51                | 44.98                    | 27.5                              | 44.96                                    |
| 6                  | 4                    | 87                 | 34.65                | 30.15                    | 34                                | 29.58                                    |
| 7                  | 4                    | 132.5              | 35.29                | 46.77                    | 35.5                              | 47.04                                    |
| 8                  | 6                    | 433                | 27.84                | 120.55                   | 27.5                              | 119.08                                   |
| 9                  | 3                    | 115                | 32.07                | 36.88                    | 32                                | 36.88                                    |
| 10                 | 5                    | 356                | 37.80                | 134.6                    | 38                                | 135.28                                   |
| 12                 | 5                    | 321                | 33.71                | 76.14                    | 23.5                              | 75.44                                    |
| 13                 | 5                    | 76.5               | 29.22                | 22.36                    | 29                                | 22.19                                    |
| 14                 | 5                    | 130.5              | 31.14                | 40.64                    | 31.5                              | 41.11                                    |
| 15                 | 5                    | 175                | 32.43                | 56.80                    | 31.5                              | 55.13                                    |
| 16                 | 5                    | 185.5              | 25.54                | 47.38                    | 25                                | 46.38                                    |
| 17                 | 4                    | 148                | 33.63                | 49.78                    | 33                                | 48.84                                    |
| 18                 | 4                    | 121                | 31.17                | 37.72                    | 31.5                              | 38.12                                    |
| 19                 | 4                    | 87                 | 31.89                | 27.75                    | 32                                | 27.84                                    |
| 20                 | 5                    | 56.5               | 40.9                 | 23.11                    | 40                                | 22.6                                     |
| 21                 | 3                    | 51.5               | 34.99                | 18.02                    | 34.5                              | 17.77                                    |
| 23                 | 5                    | 126.5              | 30.27                | 38.30                    | 31                                | 39.22                                    |
| 24                 | 5                    | 152                | 25.57                | 38.88                    | 26                                | 39.52                                    |
| 25                 | 5                    | 106.5              | 25.78                | 27.46                    | 26                                | 27.69                                    |
| 26                 | 4                    | 104.5              | 22.24                | 23.24                    | 22                                | 22.99                                    |
| 27                 | 5                    | 177                | 32.72                | 57.92                    | 33                                | 58.41                                    |
| 28                 | 5                    | 376                | 34.03                | 127.98                   | 35                                | 131.60                                   |
|                    |                      | <hr/> 4,819.5      |                      | <hr/> 1,519.88           |                                   | <hr/> 1,519.52                           |

TABLE C

| Patron's<br>Number | No. de-<br>liveries | Lb.<br>cream | Ave. test<br>each de-<br>livery | C. C. test<br>composite | Milk<br>thief<br>com-<br>posite | Total B.<br>fat every<br>day | Total B.<br>fat C. C.<br>compo-<br>site | Total B.<br>fat Milk<br>thief<br>composite |
|--------------------|---------------------|--------------|---------------------------------|-------------------------|---------------------------------|------------------------------|---|--|
| 1                  | 6                   | 554          | 31.14                           | 30.5                    | 31                              | 172.52                       | 168.97                                  | 171.74                                     |
| 2                  | 6                   | 197          | 38.78                           | 38.5                    | 39                              | 76.4                         | 75.85                                   | 76.83                                      |
| 3                  | 6                   | 307          | 35.73                           | 36.5                    | 36                              | 109.72                       | 112.06                                  | 110.52                                     |
| 4                  | 5                   | 205.5        | 36.86                           | 37                      | 36                              | 75.75                        | 76.04                                   | 73.98                                      |
| 5                  | 7                   | 150          | 36.93                           | 36                      | 39                              | 55.4                         | 54.00                                   | 58.50                                      |
| 6                  | 3                   | 68           | 33.35                           | 34.5                    | 33.5                            | 22.68                        | 23.46                                   | 22.78                                      |
| 7                  | 6                   | 372.5        | 23.07                           | 23.5                    | 23                              | 88.17                        | 94.86                                   | 98.58                                      |
| 8                  | 4                   | 372          | 26.4                            | 25.5                    | 26.5                            | 98.17                        | 94.86                                   | 98.58                                      |
| 9                  | 5                   | 197          | 33.72                           | 33                      | 33.5                            | 66.44                        | 65.01                                   | 66   |
| 10                 | 5                   | 313          | 33.5                            | 34                      | 33.5                            | 105.99                       | 106.42                                  | 104.86                                     |
| 11                 | 3                   | 77.5         | 18.68                           | 19                      | 18                              | 14.48                        | 14.72                                   | 13.95                                      |
| 12                 | 6                   | 296.5        | 22.27                           | 22.5                    | 21.5                            | 66.06                        | 66.71                                   | 63.75                                      |
| 13                 | 6                   | 89           | 30.91                           | 30.5                    | 31                              | 27.51                        | 27.15                                   | 27.59                                      |
| 14                 | 6                   | 179.5        | 32.45                           | 32.5                    | 32                              | 58.26                        | 58.34                                   | 57.44                                      |
| 15                 | 6                   | 172.5        | 32.62                           | 32.5                    | 32                              | 56.28                        | 56.06                                   | 55.20                                      |
| 16                 | 4                   | 147          | 26.65                           | 26                      | 26                              | 39.18                        | 38.22                                   | 38.22                                      |
| 17                 | 5                   | 194.5        | 33.2                            | 33.5                    | 33                              | 64.74                        | 65.16                                   | 64.19                                      |
| 18                 | 5                   | 114          | 28.63                           | 28.5                    | 29                              | 32.64                        | 32.49                                   | 33.06                                      |
| 19                 | 5                   | 122.5        | 34.42                           | 34.5                    | 33.5                            | 42.17                        | 42.26                                   | 41.04                                      |
| 20                 | 6                   | 54           | 42.81                           | 43.5                    | 44                              | 23.12                        | 23.49                                   | 23.76                                      |
| 12                 | 4                   | 63           | 36.11                           | 36.5                    | 37                              | 22.75                        | 23.                                     | 23.31                                      |
| 22                 | 6                   | 99           | 34.89                           | 36                      | 35.5                            | 34.55                        | 35.64                                   | 35.15                                      |
| 23                 | 7                   | 93           | 27.33                           | 28                      | 27.5                            | 25.42                        | 26.04                                   | 25.58                                      |
| 24                 | 4                   | 158.5        | 24.05                           | 24                      | 24                              | 38.12                        | 28.04                                   | 28.04                                      |
| 25                 | 6                   | 140.5        | 23.07                           | 23                      | 23                              | 32.42                        | 32.32                                   | 32.32                                      |
| 26                 | 6                   | 94.5         | 26.48                           | 26                      | 27                              | 25.03                        | 24.57                                   | 25.52                                      |
| 27                 | 4                   | 141          | 34.34                           | 33.5                    | 34.5                            | 48.42                        | 47.24                                   | 48.65                                      |
| 28                 | 7                   | 539.5        | 30.98                           | 31.5                    | 31                              | 167.13                       | 169.94                                  | 167.25                                     |
|                    |                     |              |                                 |                         |                                 | 1,687.29                     | 1,675.70                                | 1,672.99                                   |

TABLE D

| Patron's<br>Number | No. de-<br>liveries | Lb.<br>cream | Ave. test<br>each de-<br>livery | C. C. test<br>composite | Milk<br>thief<br>com-<br>posite | Total B.<br>fat every<br>day | Total B.<br>fat C. C.<br>compo-<br>site | Total B.<br>fat Milk<br>thief<br>composite |
|--------------------|---------------------|--------------|---------------------------------|-------------------------|---------------------------------|------------------------------|---|--|
| 1                  | 6                   | 497          | 33.83                           | 34                      | 34                              | 168.16                       | 168.98                                  | 168.98                                     |
| 2                  | 6                   | 181.5        | 41.26                           | 42                      | 41                              | 74.89                        | 76.23                                   | 74.42                                      |
| 3                  | 6                   | 342.5        | 34.31                           | 34.5                    | 34                              | 117.51                       | 118.16                                  | 116.45                                     |
| 4                  | 4                   | 156          | 35.23                           | 36                      | 34.5                            | 54.97                        | 56.16                                   | 53.82                                      |
| 5                  | 6                   | 249.5        | 35.03                           | 35                      | 34.5                            | 87.41                        | 87.33                                   | 86.08                                      |
| 6                  | 3                   | 75.5         | 35.37                           | 35.5                    | 34.5                            | 26.71                        | 26.80                                   | 26.05                                      |
| 7                  | 5                   | 359          | 24.97                           | 25.5                    | 25                              | 89.65                        | 91.55                                   | 89.75                                      |
| 8                  | 5                   | 416.5        | 24.35                           | 24.5                    | 24                              | 101.41                       | 102.04                                  | 99.96                                      |
| 9                  | 4                   | 132          | 40.72                           | 40.5                    | 39.5                            | 53.75                        | 53.46                                   | 52.14                                      |
| 10                 | 4                   | 259          | 34.27                           | 34.5                    | 33                              | 88.77                        | 89.36                                   | 85.47                                      |
| 11                 | 3                   | 114          | 22.44                           | 23                      | 21.5                            | 25.58                        | 26.22                                   | 24.51                                      |
| 12                 | 4                   | 305.5        | 22.45                           | 22.5                    | 22.5                            | 68.60                        | 68.74                                   | 68.74                                      |
| 13                 | 6                   | 135.5        | 30.79                           | 30.5                    | 30.5                            | 41.73                        | 41.33                                   | 41.33                                      |
| 14                 | 6                   | 251          | 29.40                           | 29                      | 29                              | 73.83                        | 72.79                                   | 72.79                                      |
| 15                 | 6                   | 301.5        | 33.10                           | 33                      | 33                              | 99.8                         | 99.50                                   | 99.50                                      |
| 16                 | 4                   | 157          | 28.24                           | 28                      | 28                              | 44.35                        | 43.96                                   | 43.96                                      |
| 17                 | 4                   | 153          | 34.49                           | 34.5                    | 34                              | 52.78                        | 52.79                                   | 52.02                                      |
| 18                 | 5                   | 119          | 34.54                           | 34                      | 34.5                            | 41.11                        | 40.46                                   | 41.06                                      |
| 19                 | 4                   | 210          | 31.73                           | 31.5                    | 32.5                            | 66.63                        | 66.15                                   | 68.25                                      |
| 20                 | 6                   | 83.5         | 35.35                           | 35                      | 35.5                            | 29.52                        | 29.23                                   | 29.64                                      |
| 21                 | 5                   | 118          | 39.45                           | 39                      | 39                              | 46.56                        | 46.02                                   | 46.02                                      |
| 22                 | 6                   | 84           | 37.68                           | 38                      | 37                              | 31.65                        | 31.92                                   | 31.08                                      |
| 23                 | 6                   | 96.5         | 28.34                           | 29.5                    | 28                              | 27.35                        | 28.47                                   | 27.02                                      |
| 24                 | 4                   | 144          | 27.7                            | 29.5                    | 29                              | 39.89                        | 42.48                                   | 41.76                                      |
| 25                 | 6                   | 224          | 25.99                           | 25.5                    | 25                              | 57.22                        | 57.12                                   | 56   |
| 26                 | 1                   | 12           | 24                              | 24.5                    | 24                              | 2.88                         | 2.04                                    | 2.88                                       |
| 27                 | 4                   | 145.5        | 34.12                           | 34.5                    | 34                              | 49.65                        | 50.20                                   | 49.47                                      |
| 28                 |                     | 461          | 30.41                           | 30                      | 30                              | 140.22                       | 13.83                                   | 13.83                                      |
|                    |                     |              |                                 |                         |                                 | 1,679.29                     | 1,684.22                                | 1,659.68                                   |

In tables A and B the composite samples were taken by means of a milk thief. In C and D an additional composite sample was taken by means of the cubic centimeter system.

The results of the above tables were obtained by handling the cream delivered by thirty of the patrons of the University of Illinois creamery.

Briefly the system is described as follows:

Use one-half pint bottles for composite sample jars.

Paint the number plainly on each jar, or write the number on a gummed label. In either case cover the number with two or three coats of chilac in order to prevent it from being washed off.

Place these jars in a rack near the weighing can, where they may be looked up if necessary. To each jar add the same amount of preservative as would be needed for milk.

For the patrons that deliver the cream to the factory, use an ordinary milk thief to sample the cream with. Always pour the cream into the weigh can to be weighed and sampled.

Regarding the handling of the samples brought in by the cream-haulers—the number on the composite sample jar should be the same as on the corresponding bottle in the driver's case, for the same patron.

Do not attempt to handle a lot of bottles without numbers on them.

To handle a composite sample from a driver's case one should take out an aliquot part of the number of pounds of cream collected from the patron. It would not do to empty all of the samples into the composite jar. For the driver is to fill his bottle, no matter how many pounds of cream the farmer has; but instead take a 25 c. c. burette and for every hundred pounds of cream take out a certain number of cubic centimeters. Govern the amount taken out for each patron by the amount of cream he produces. The one-half pint sample jars should be from one-third to three-fourths full at testing time.

For instance—farmer A, B and C produce respectively 33, 100 and 150 pounds of cream as an average every two days;

cream being collected seven times during the testing period of fifteen days. For A, take out one c. c. for every pound of cream; for B, one c. c. for every four pounds and for C, one c. c. for every six pounds, etc. It is a good plan to mark on the sample bottle the c. c. required as it must be constant. If it is one to one, or one to four, it must be the same for each delivery. From the above we find that A would have 210 pounds of cream and 210 c. c. in composite sample jar at the end of seven deliveries, providing the 30 pounds in two days was constant.

B—700 lbs. and 175 c. c.

C—1050 lbs. and 150 c. c.

The buttermaker should always weigh the cream brought in by the haulers and also take a sample for butter fat determination. This gives check on the work.

In order to get at the number of pounds of butter fat taken in during the day, use the same method that you would use for one patron, i. e., a composite sample of the cream delivered.

The cream and preservative should be well mixed and after each new addition of cream the sample should be thoroughly mixed by a rotary motion of the bottle

Keep the jar covered to prevent drying. Prepare the samples for testing by placing them in warm water at a temperature of 120. Do not get the water too warm. After the cream has been warmed it becomes less viscous and will more readily mix greater a sthe per cent of fat and acidity increases.

Weigh out 18 grams of cream by pipette. It must not be measured because the amount of fat contained in cream is large enough to change the specific gravity and variation becomes greater a sthe per cent of fat and acidity increases.

Use the straight-neck Babcock bottle, graduated to hold percents. Never weigh out nine grams of cream in a bottle graduated for 18 grams and double the reading. Bottles can be obtained which will give direct reading when 9 grams are used.

To each bottle containing the 18 grams of cream, add 17.6 c. c. of acid and thoroughly mix by gentle rotation of the bottle and before placing the bottles in the machine add to each a



sufficient amount of water at a temperature of 120 to 140 to float the fat to the neck of the bottle, whirl for five minutes at regulation speed 1,000 R. P. M. for twenty-four bottle machine. Add enough water of the same temperature as before to bring the column of fat within the graduation, and whirl another minute or two. Make the reading while the temperature of the fat is between 120 and 140. Avoid getting the sample too warm. The cream tests are often dark, having a burnt appearance due to the tester overheating the sample.

A good deal has been said and written about the handling of the cream after it reaches the creamery and yet we know very little about it, for it is yet in its experimental age. We all know that the practical dairyman should be one who has studied the problems involved and has ascertained that cream once spoiled cannot be brought back to its original flavor by anything that is within the power of the buttermaker. The day cannot come too soon when every farmer, who milks because cows give milk, sells cream because he has it to sell and finds fault with the creamerymen because he thinks he is not getting enough, will kick himself out of the dairy business. It is true that competition is the life of trade, but in the creamery business it is often the loss of quality. Just think what it would mean to the dairy interest in general if we should all resolve to work for quality and not for quantity. It does not add anything to the buttermaker's credit when he boasts that he has increased the business of the creamery, if he has paid no attention to the quality of work done. Has he been very careful in ripening the cream, handling the starter, using the acid test, etc.?

For the creameries handling both whole milk and cream the work should be done about as follows:

Get the cream patrons to bring in the cream while it is sweet and deliver in the morning while the milk is being delivered. Mix the sweet cream with the milk in the receiving vat and run it through the separator. The cream that has taken on acid should not be mixed with the cream in the vat until that cream has ripened, because a small amount of unripened cream can be

mixed with a larger amount of ripened cream without serious result, while on the other hand the sour cream would act as a starter—giving undesirable results.

The larger centralizing plants and smaller hand separator creameries generally have a system of their own. Good methods of doing work vary, but for those without any definite system to govern their work, I would suggest the following plan, regarding the handling of the cream in the creamery.

Insist on having the patrons deliver the cream often, and that it is sweet and clean, containing over 30 per cent butter fat.

Reject all poor, off-flavored cream, for you owe this to the patrons who are producing the good cream.

Grade the cream so as to get the cleanest in the cream vat first and to this add your liberal amount of starter. After ripening this cream for several hours, or until you have control of the flavor, mix in the balance of the cream and continue ripening until 45 per cent of acid has been developed. The cream should then be cooled. During the summer season it should be cooled 48 degrees F. and held for several hours at that temperature before it is churned.

The importance of using starters in ripening and improving hand separator cream should not be overlooked. Do not think that because the cream is sour it does not need the starter. It has been found that starter will improve the flavor of the butter made from sour separator cream whether the cream is pasteurized or unpasteurized. Let us consider for a few minutes the handling of the cream when pasteurizers are used. Better and more efficient work can be done when handling cream containing 32 per cent or more of butter fat. In that case more starter could be used and the curdling of the cream which takes place in pasteurizing sour cream, could be reduced. The man in charge of the pasturizer should understand why cream is pasteurized and how each particular machine should be handled. Different makes vary as to the general effect upon the cream. Points to be considered in an efficient pasteurizer for handling cream containing a high per cent of acid and other objectionable flavors are:

Aeraton. This is very essential. Pasteurize the cream with as little curdling as possible. Avoid exposing large quantities of cream to a small heating surface. An efficient cooler in operation with the pasteurizer is needed. The cooler should be of sufficient cooling capacity to allow the pasteurizer to be operated at its full capacity.

The cream should be thoroughly mixed before it is allowed to flow into the pasteurizer. Observe directions pertaining to the starting of the machine. The first cream in the machine should not be heated to regular pasteurizing temperature, but start the flow of cream into the pasteurizer in time to force the first cream into the cooler at a temperature of 140 degrees F, and rapidly increase the temperature to 170 to 185 F.

It is apparent that the curdling of sour hand-separator cream is greater as the percent of butter fat decreases and acidity increases. Also that the curdling of the first cream entering the pasteurizer is greater if it is heated to 170 or 180 degrees F, instead of 140, before it leaves the machine.

Pasteurized sour cream should be cooled to a lower temperature for churning than the same grade of unpastuerized cream. It should be held at low temperature for some time in order to give results desired. In the factories where the cream warms again after it has once cooled, it should be cooled so that at churning time the temperature will be 48 degrees F.

The excessive loss of butter fat in buttermilk from pasteurized sour cream can, by the above method, be reduced to the minimum. The pasteurization of sour cream containing less than 30 or 32 per cent of butter fat will curdle part of the casein in the cream. The curdled particles of casein will contain a certain amount of fat which can not be incorporated with the butter obtained by churning; hence a greater loss. Results of several tests show that the curdled casein will contain in the neighborhood of 20 per cent of fat and in a few cases as high as 30 per cent has been found.

The following table shows the acidity of the cream and the

average per cent of fat and shows the loss in the buttermilk when part was pasteurized and part was not.

We find where the cream contained the higher per cent of fat no curdling took place and the loss in butter fat was about the same. Where the per cent of fat was lower the loss of butter fat was considerably higher.

| Vat No. | Per cent acidity | Per cent fat | Per cent starter | Temp. cooled to | Hours held cold | Temp. churned | Pasteurized Temp. | Effect on cream |
|---------|------------------|--------------|------------------|-----------------|-----------------|---------------|-------------------|-----------------|
| 1       | .57              | 28           | None             | 44F.            | 10              | 47            | 160 to 170        | curdled         |
| 2       | .54              | 28           | 5                | 44              | 8               | 47            | 165 "             | "               |
| 3       | .64              | 28           | 5                | 44              | 12              | 48            | 170               | "               |
| 4       | .72              | 29.5         | 4                | 44              | 8               | 48            | 170               | "               |
| 5       | .63              | 35           | 4                | 44              | 8               | 48            | 170               | "               |
| 6       | .69              | 29           | 5                | 44              | 10              | 48            | 165 " 175         | did not cur.    |
| 7       | .70              | 30           | 4                | 44              | 12              | 48            | 170 " 180         | curdled         |
| 8       | .70              | 35           | 4                | 44              | 12              | 47            | 170               | "               |
| 9       | .70              | 32           | 4                | 44              | 10              | 48            | 170 " 170         | did not cur.    |
| 10      | .68              | 30           | 4                | 44              | 12              | 48            | 170               | curdled         |

#### Loss B. Fat in Buttermilk

| Unpasteurized | Pasteurized |
|---------------|-------------|
| .15           | .8          |
| .10           | .6          |
| .10           | .5          |
| .10           | .6          |
| .10           | .2          |
| .10           | .4          |
| .08           | .7          |
| .08           | .15         |
| .10           | .20         |
| .05           | .50         |

By the President:—In my appointment of committee on nominations, I made the chairman J. P. Mason, of Elgin. We want him very much in this association, and he is made of that kind of stuff that will not recommend his own name, so I will appoint some one else in his place under the circumstances. I will name Mr. Upton, of Effingham. I wish them to report after the next paper.

The next on the program is the handling of milk for city milk supply and that of milk on the farm, by Mr. Benj. Hauk, of St. Louis. Mr. Hauk is unable to be present and has handed his paper to Mr. Trueman and will be read in connection with his own paper.

#### THE HANDLING OF MILK FOR THE CITY MILK SUPPLY.

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By Mr. Benj. Hauk, of St. Louis, Mo.

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For the past fifteen years I have been identified with one of the largest milk companies in the city of St. Louis, and during that time there has been many changes in the handling of the raw product, both by the producer and by the distributor to the consumer.

The old way of handling the milk for distribution to the consumer was, the milk would be received by us in and under all conditions; some would be warm, and there would be all variations in the percentage of butter fat. This milk would be all dumped together, put in ice boxes filled with ice and water. The next morning it would be distributed in the ordinary eight gallon cans and served to customers in the old way of dipping from the can into any old vessel the housewife might find convenient the minute the driver called. A great many of these vessels would be unfit for the receiving of milk, and the results were in a very few hours the milk would become turned. Complaints were numerous in those days, but since then, vast progress has been made, as stated before.

At the present time we have our milk shipped, mostly from our own stations in the country, where the milk is properly handled and taken care of. I especially refer to the stations along the Vandalia line, which are under the special supervision of a man who is thoroughly competent in the milk industry.

This party has several creameries along the Vandalia road, all of which are equipped with the most modern machinery for



handling the product. The milk is delivered to these plants in the morning, and the morning and evening's milk are kept separate. The milk is then weighed, tested, put through a modern sanitary filter, through a pasteurizer and heated to a temperature of 100 degrees, flows over a modern aerator and cooler, is cooled down by the means of brine to a temperature of 35 degrees, or lower, put into cans which are stored in a refrigerator room, cooled by artificial refrigeration and are held there until train time.

By this method the milk reaches the dairy within a few hours and the temperature of the milk and cream when received is about 40 degrees. Getting the milk into this condition direct from our stations enables us to take the proper care of it at our end of the line, which we do by refiltering and repasteurizing, which is immediately bottled by a modern bottling machine and put in cold storage, when it is ready for delivery.

By this improved method of handling the milk, we are able to give our customers a quality of milk and cream that in previous years was unknown.

If there are any person or persons present who are interested in the shipping of milk and cream for the city supply, I urgently request them to take every precaution they possibly can to see that the milk at their end of the line is properly taken care of, and I sincerely trust there will be other shippers who will carry out similar plans for the handling of their product as our friend has been doing along the Vandalia line, by equipping their stations in such a way that not only will they be profitable to themselves, but beneficial and profitable to the dairy they ship to in the city.

Thanking you very kindly for the attention you have paid to the reading of my address, which I assure you is appreciated, and which some day I may be able to reciprocate, I am, yours truly, Ben C. Hauk.

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**CARE OF MILK ON THE FARM.**

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By J. M. Trueman, of Urbana, Ill.

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By the President:—I would say that Mr. Trueman is the gentleman who works on the staff of the University, and largely the past year in the city milk supply work of Chicago. Mr. Trueman.

Mr. President: I am very glad to have your patience bespoken for me. This is the first time I have addressed an Illinois audience of farmers, as I have only been in the state since the first of last April. I rather feel it is my introduction to the dairymen of the state.

I began making speeches at Farmers' Institutes fifteen years ago in Nova Scotia. Since that time I have attended conventions and farmers' institutes and lived in New York, Pennsylvania and South Dakota. You know that "a rolling stone" don't amount to much. I must say that the conventions I have attended in other states and the experiences I have had with farmers have always been good. I do want to say to the farmers of Effingham county and to the Dairymen's Association of the State of Illinois I have more than enjoyed myself yesterday and today up to the present moment in this convention. The banquet given us last night I assure you I thoroughly enjoyed the good things to eat, and enjoyed more the hearty feeling of good fellowship that prompted the committee to tender us that banquet. (Applause.) We appreciate your generosity, your fellowship and hearty welcome you have given us, and I think that my work in Illinois is going to be delightful among such delightful people. But I will get to work.

Rather than go wading around, and not say what I want to, I will have to stick pretty close to the manuscript. After I had written it, it wouldn't fit the name, so I had to make a new name for it, and have called it "Relation of the Farmer to Better Milk."

I would like to make a statement about what Mr. Lee said a moment ago. I want to say to you here that one thing that makes our work unpleasant, that makes me say that if ever I get out of this work, back on the farm I will go, is to spend our time nights trying to get the work ready for the students, planning work for the people at home or in field work, and then have them as suspicious of us as though we wanted to injure them. We are not selling patent medicines, lightning rods or hand separators. We are honest and square. We may sometimes have visions, but you don't follow us very far.

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#### THE RELATION OF THE FARMER TO BETTER MILK.

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By J. M. Trueman, University of Illinois.

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Almost every issue of every dairy paper contains an article or a paragraph on this subject. Rules for producing clean milk have been written and rewritten time and again. There can be no doubt that this continued repetition has produced some effect, and that more dairies are producing clean milk than was the case ten years ago. I will not, therefore, in this address, take up the detailed account of how milk should be handled on the farm, but rather attempt to get at some of the reasons for present conditions and seek for some remedy that may be applied to the general situation.

In beginning the discussion of this problem we must first settle a few questions that are often asked by the farmer. First—does the milk that is produced on the ordinary dairy farm contain much dirt anyway? The barns are no worse than they have been for years; why all this sudden outcry against the present conditions? Without stopping to explain the suddenness of the outcry, let me ask the farmer a few questions. Is your barnyard drained and graded, so that the cows are not obliged to wade knee deep in mud and manure? Is your barn well lighted and ventilated, so that the air may be pure and so that you can see

the cobwebs and dust if there be any? Is the ceiling over the cow stalls tight so that dust does not fall on the cow and in the milk pail? Is the floor dry and smooth, so that it may be easily kept clean? If such conditions do not exist then we know that you are heavily handicapped in your work. It is not possible to produce clean milk from dirty cows, dirty barns and dirty milkers. I wish I could say that very few barns in Illinois are in that condition, but I cannot. The great majority are in such shape that the production of clean milk is well nigh impossible even when the farmer has the best of intentions.

But what about the actual condition of the milk as we find it in our creameries and on our tables? Do we really find that its condition is not right? In a great many cases an examination of the inside of the can after the milk is emptied will show a large amount of dirt on the bottom, and if the bottled milk is allowed to stand for an hour or more, all kinds of dirt may be seen through the bottom of the bottle. Even milk bottled in the large cities by reputable firms often contains enough dirt to be easily seen by the naked eye, and we consider that about 50 per cent of the dirt getting into the milk is soluble. In more than 50 per cent of the glasses of milk I buy at the restaurants in our cities I find that fine, rich deposit in the bottom of the glass. I would have no objection to the deposit on my garden, but scarcely appreciate it in the milk.

We must admit, therefore, that a large part of the milk is far from clean, but supposing that is true, what difference does it make? Our fathers have used that kind of milk for generations and the previous generations are said to be healthier than ours. Of course that is not altogether true, and if it was true it would only prove that the former generations had not lived and eaten in such a way as to give health and strength to their descendants. Will the milk hurt anyone? Is it dangerous to use it? Can we not make good butter and cheese from it? If it is perfectly healthy and we have lately become squeamish about the matter, and been working up a fad, let us admit it and cease to harrow up the feelings of the farmer by telling him

his milk contains 200,000 bacteria in every twenty-five drops and is not fit for human food. Although some people may have been extreme in their denunciation of ordinary milk, the fact remains that it is only wholesome for people with strong digestive apparatus. The rugged country boy who secured a good start in life on the milk nature provided for him may switch over on to cow's milk and do very well on that which is not produced under good conditions. The same milk may be poison to his little cousin in the city, who has not the other ideal conditions to help him that the country boy has. But even in the country we often see the little fellows succumb and who knows but what the poor milk even there had its share in deciding the battle against the little fighter. It has been found in the last few years that the death rate among children in the crowded cities may be very materially lowered by furnishing them with pure milk and leaving all other conditions unchanged. The fact is this, impure milk is always dangerous, and especially so to small children and for invalids. Again, no matter how good a man's digestion may be it is not appetizing, to say the least, to find that dark deposit in the bottom of your glass after drinking a half pint of milk.

We must, furthermore, admit then that the milk is not only dirty, but that it is unwholesome. Are we, therefore, to condemn the farmer utterly and go after him without mercy? In order to test his attitude toward the subject we will visit him and tell him how matters stand. We approach him with confidence and say, "The public is demanding cleaner milk. They have found out that the milk you have been giving them is not wholesome, and we expect you to remodel your barn, to clean up your barnyard, to have your cows tested and to use the latest sanitary methods in milking." He turns on us like a flash and says, "No, sir, I can't afford to do any such thing; there's not enough money in it and furthermore I propose to run my own business, my own way, without getting orders from anyone."

Now, although we know that is not just the right attitude, we do not feel like condemning the farmer wholly for his feelings.



Every farmer does not feel that way. We have all over this country men who are doing their best not only to meet the demand for better milk, but to create a demand. A few men who were favorably situated or had the pluck to undertake the work, have established sanitary dairies that are the pride of every man who is working for better milk. Our own state contains a number to which we can point with satisfaction that are models in every way. These models, however, have not always proved an inspiration to the farmer. He has read about the expensive stables and dairy houses; about the great amount of labor employed and the expensive apparatus used, and it has discouraged him. He has not the capital to do the things that way. Perhaps he has not the business ability. He is a plain, level headed farmer and knows that he could easily spend more money on his dairy than he could get back, so he takes the safe course and continues on in the old way.

But the old way will not always do. There is a movement afoot that has the whole force of an awakened nation behind it, that demands pure food and milk will not be left out. A few weeks ago in talking with a manager of a large restaurant in a large city in a neighboring state, he said with great emphasis: "I can get good meat and good fruit and good vegetables, but I can not get good cream and butter. Why is it? What was I to tell that man? That the farmers of this great progressive country do not care enough about the milk they produce to keep it clean? Or was I to tell him that the dealer from whom he bought his supplies does not run his creamery right and spoils the cream in getting it separated from the milk and in pasteurizing it. Or was I to lay the fault at the door of the hurried business man who can not take time to demand that he be given a good article, but eats the poor cream and the rancid butter and grumbles his way back to business. As a matter of fact there is fault in all three places, and you must not put it all on the farmer. It is with him, however, that I must deal today and leave the careless creameryman and the unthinking public to a future time.

The same restaurant manager referred to above, objects seri-

ously to pasteurized cream for his coffee unless the work has been carefully done. I wonder if you know why milk and cream are never pasteurized? It is not because pasteurization adds any desirable flavor or keeping quality to the milk, cream or butter, but because there are flavors developing in the milk and cream that we must head off. Where did those flavors get their start?

In a letter written by one of the leading creamery firms in this state a few days ago I read this statement: "The farmer does not, up to this date, take proper care of his product for delivery to the manufacturer." For that reason, this company furnishing its creameries with pasteurizing outfits and lays the blame on the need of them on the farmer.

How, then, can we reach this man who is responsible for starting our troubles. We are convinced that he can be relied on to do the right thing when he understands the situation, and when a feasible and inexpensive method is worked out for the improvement of his dairy. Shall we go after him with a state law? We have that already. The Food Commissioner has authority to visit any place where he thinks unwholesome food is produced and prosecute all offenders. This, however, is an enormous task and is altogether too general a commission ever to accomplish the results we are after. It has the advantage of furnishing legal redress in very serious cases and is of great value when contagious diseases get among the cows.

Shall we turn, then,, to the agricultural college and ask them to send out field workers to visit every farm and instruct every farmer how to handle his dairy? Here again we have an enormous undertaking. It would not do, for two reasons; first, the college could not furnish enough skilled men to do the work, and second, the farmers would not be disposed to listen to them if the college could find them. Experiment station field workers can visit the creameries and gain the confidence of the buttermakers and be of great help to them, but the farms are too numerous and the farmers too suspicious.

Of late years it has become common for many companies owning milk bottling plants and condensaries to require the far-

mer to sign a contract agreeing to run his dairy according to certain rules made by the company, and to permit an inspector to visit the farm at any time. This method has the great advantage of bringing the farmer face to face with a set of rules relating directly to his business and of dividing the work of inspection among a large number of men. The rules may not always be the best and it is often difficult to secure good inspectors. It should not be impossible, however, to agree upon a fair set of rules, and it is possible to educate inspectors.

The inspector should be something more than a man who is able to read the rules. Any company or individual who has tried this method knows that the success of the work lies largely with the inspector. He can make a good patron out of a poor one or he can drive away the best. Any attempt at mere arbitrary dictation for the sake of showing authority is justly resented by the farmer. On the other hand a fair and careful explanation of the rules and an evident spirit of fairness toward the farmer's interests will meet with a hearty response from most men. The inspector is the link between the company and the farmer and he should be one of the most valuable men in the community and should be paid accordingly. He should not be a young graduate from an agricultural college without experience, as a large part of his success will depend upon his ability to fraternize with the farmer. He should be an experienced dairyman, who has in some way gained the scientific knowledge necessary for successful inspection and instruction. For here I hold is the strong point of the system. Every inspector should be an instructor. He comes in constant contact with the farmer, should be the man who gains his confidence and can discuss with him in a friendly way the best methods for the farmer to employ. He might spend some time at an agricultural college where he could become familiar with the best and latest methods. A number of weeks spent in a college where these things are being studied would bring to his attention the essential points and what is of greater value, add to his enthusiasm in the cause of pure milk production.

I have met a number of men who are already doing this

work in this state and have found that they have materially improved conditions where they have charge. It seems to me the system is capable of indefinite extension and would result in great good to the farmer as well as the manufacturer. Every creamery in the state would do well to employ a man to give at least part of his time to this work. In small places the head buttermaker might be given enough assistance in the creamery to enable him to visit the patrons frequently and explain to them why and how the conditions on their farms might be improved. Such a man with a contract behind him would do more for the improvement of milk on the farm than can be done in any other way. I hope the time is coming when we will pay more attention to the quality of our dairy product and be willing to pay the price to get them. The constant struggles we make to cheapen production are always tending to lower the quality of our goods. It would be far better to spend enough money to insure a good article and I think we will find the public willing to pay for it.

The farmer sometimes objects to signing this contract and declares that he can run his own business without dictation from any person; so said the beef trust; so said the butterine manufacturers, and in fact, a whole army of food producers. But today they are all inspected and are obliged to conform to established rules. The farmer should consider the inspector his best friend and get out of him every bit of information he can give. Pump him dry and if he does not know enough, make the creamery get a better one. The increase in the production of his herd, the improvement in the quality of his milk, and the better price paid where the product can be depended upon, will richly repay the farmer for signing the contract.

I wish to emphasize the fact that there is nothing in this arrangement whereby the farmer gives up his authority over his farm or suffers in his dignity. The point for which the creamery, the condensery and the bottling plant are working is the same thing that the farmer should be after; namely, the production of a large amount of good milk. If success comes to one it must come to the other; if failure comes to one it must also come to

the other. The creamery cannot be successful without an ample supply of pure milk. The farmer is only successful when he produces that supply. The creamery is not particular whether the farmer adopts the King system of ventilation, or some other; only so he has pure air in his barn. The creamery is not particular whether the farmer cools his milk with well water, spring water, or with ice, only so he cools it in a cleanly way. The creamery does not care whether the farmer keeps Holsteins or Jerseys, only so he delivers milk of good average quality. The creamery does not care whether the women or the men do the milking, only so it is done in a cleanly way. In fact, the creamery or condensery in order to be successful must have guaranteed goods, and it is manifestly to the farmers interest to be so careful in all his work that he can furnish the goods every time.

Here then comes in the good work of the wise inspector. He knows what the manufacturers want and ought to be able to give the farmer advice and assistance in meeting those wants.

What now are the things necessary for the production of pure milk? First, I would like to insist on a dry barnyard. I know it is not easy to have this on the level soil of Illinois, but even here it is possible and not extremely expensive. It is not so much the cost of these improvements that hinders them being made as it is the disposition to get at it. The farmer thinks it will cost a lot, and for that reason excuses himself from studying out working plan. A few drains properly laid, a few days work with a scraper, a few loads of gravel or cinders and the result is surprising. The manure should be spread on the field as soon as made or stored in a covered shed where the cows will not tramp it up into unsightly filth holes. The whole cost of this improvement is not heavy, but can be done by the men on the farm when other things are not pressing.

Now suppose we step inside the stable. The first thing we notice is the floor, and if it is of cement well laid we are more than pleased; if it is of good sound plank well laid we are satisfied; if it of rotten boards and rails, or of soft dirt we seriously object and recommend a change. If the dirt is dry and good



bedding is used it is quite possible to produce good milk, but the condition is not what it should be. The dry dirt is stamped into dust under the front feet of the cows and ramped into mud under their hind feet. We will suggest then that a part of the stable be floored over with good planks or cement at once, and the heaviest milkers given the cleanest part. Continue laying plank or cement as fast as time and money can be found until the whole stable has a good floor. If possible, let part of the floor be laid in cement each year, doing a thorough job as you go, and in a few years you will have a floor to be proud of. This does not require expensive help. The department at Washington has just sent out a bulletin especially to teach farmers how cement may be economically employed upon the farm.

I am not particular how you tie your cows. You may use a strap, a chain, a swing stanchion, or not tie at all, and get good results. This is not saying that one method is not as good as another, but that all of them can be safely used.

Milk is extremely quick to absorb odors; therefore, the air in the barn should be pure, and not for this reason alone, but as well for the health of the cow. A close stable means impure air, and impure air means weakened cows, susceptible to disease. I visited a number of stables in Northern Illinois last spring after the sun had begun to warm up old mother earth and the stench on opening the door was sickening. It did not seem possible that cows could live in that atmosphere, to say nothing of producing wholesome milk. Open the windows and doors if you can do nothing better. Get circular No. 95 from your experiment station and see how cheaply and easily good ventilation may be obtained.

The next important point about the barn is the ceiling over the cows. Have it smooth and tight as possible. No dirt and dust and cobwebs to fall on the cow's back and in the pail. Use lots of whitewash; put in some windows for light, and you need not be ashamed to have the owner of the finest model barn in the country inspect your dairy.

Keep the cows clean. For some reason or other the farmer

cleans his horse thoroughly every day. I rather think it is because it goes out on the road where the other fellow will see it. I had rather see an uncurried horse than a dirty cow, for from one comes food for myself and children and from the other only work. I would never suggest to the farmer to cease currying his horse, but only ask him to include the cow. When milking time comes the pails and cans are found bright and clean—they have been well scalded with boiling water after their regular washing.

Now all that is left for me to add is to ask the farmer to cultivate the habit of cleanliness. Be proud of being clean in your person, about your barn, with the milk. I need not multiply rules and directions, for every man, when he wants to do, will find the way.

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By the President:—Mr. Trueman wishes an opportunity to make a statement.

Mr. Trueman:—I am much obliged to you. You know a man's mind doesn't always work both ways at once. When you are thinking of one thing you may say something that kicks backwards. In laying aside my manuscript, I believe that I said the farmer was more or less suspicious of people that came to sell him things, and spoke of the patent medicine man, the lightning rod man, and they tell me I said hand separator man. Now I was thinking that the farmers were suspicious of us, and I judge the hand separator men will bear me out, the farmer asks them a good many questions and is more or less suspicious, but it was unintentional to class him with the patent medicine man, and it was farthest from my thoughts. It would ill become me to say anything against the hand separator man. I have tried to induce farmers to buy hand separators, and it is with pleasure that I make this explanation and ask you that you shall not class the hand separator man with the others. Thank you.

By the President:—Is the committee on nominations ready to report? H

Report read by Mr. Upton: "The President, Vice President

and Board of Directors shall be elected annually by ballot at the first annual meeting of the Association."

Your committee on nominations begs leave to recommend the following as your officers for the ensuing year :

For President, Mr. Lewis N. Wiggins, Springfield.

For Vice President, J. P. Mason, Elgin, Ill.

For Directors, Mr. W. R. Kimsey, Du Quoin, Ill. ; Mr. M. S. Campbell, Genoa, Ill. ; Mr. L. A. Spies, St. Jacobs, Ill. ; Mr. L. N. Wiggins, Springfield, Ill. ; Mr. J. P. Mason, Elgin, Ill. ; Mr. E. L. Wilson, Manhattan, Ill. ; Mr. H. J. Youngs, Stillman Valley, Ill.

Respectfully submitted,

E. N. Upton.

E. B. Walton.

M. S. Campbell.

By the President :—What will you do with the report?

On motion duly made and seconded, the report was adopted as read.

By the President :—Are you ready for the question? All in favor of this report say "I." Contrary. It is carried.

The election is by ballot, and it is moved and seconded that the secretary cast the vote of the members present for the ballot of the names of the people read by the nominating committee. All in favor say "I." Contrary. Carried. These members are elected for the ensuing year.

By the President :—Prof. Geo. C. Humphrey will talk to us this morning in regard to Breeds and Breeding.

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#### BREEDS AND BREEDING.

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By Prof. Geo. C. Humphrey, of the University of Wisconsin.

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Mr. Chairman :—It is my first introduction to an Illinois meeting of farmers and dairymen. I am sure that I am pleased

to meet you. I feel that the farmer "catches it," as we term it, from the buttermaker, the cheesemaker, the city retailer and the consumer. They all have something to say in regard to a lack of quality in the making of the product that he is making.

I am here this morning to give it to you also in regard to breeds and breeding. I will say, however, that I have spent the majority of my youthful days on the farm, and I am in sympathy with you. I realize today that the farmers are the backbone of this great commonwealth. Others, who are reliant on the farmers are at the small end of the horn. I realize, also, that the farmers, as a general rule, belong to an intelligent class of people, who are ever ready to adopt such rules as will make their operations more successful, consequently we do not hesitate to give it to the farmer on these subjects that we have been speaking about.

In the topic assigned to me, breeds and breeding, I feel that you have already learned a great deal from your program as given in this regard. I might give you my subject in a few words, which would be, choose a good breed and breed good dairy cows. Then I might sit down, and you would have the subject of my paper, but you can understand that in giving these subjects it is like driving a nail. We start in and then have to hammer away in order to get to the finish. If you will bear in mind those few words, I will proceed to hammer away with this article.

Before commencing to read, let me say I am too young a man to be dealing with such a subject. I should have preferred to give this subject twenty years later and been a farmer and had practical experience. It is based on personal observation, the experience of others, and what I feel to be right from the sense of principle, and I give it to you in that way and hope it will be of benefit to you.

Our subject furnishes us with unlimited material for thought and consideration. To the intelligent mind the subject is one of deepest interest and affords opportunity for the most careful observations from which are drawn inspirations that imbue us with the grandeur and sublimity of Nature and Nature's ways, back of

which we cannot fail to catch a glimpse of a wonderful Supreme Being, a divine Creator, who shapes and puts life into every being. In the light of reality, it points to the source of our greatest wealth, making it possible, both in the vegetable and the animal kingdom to produce that which affords us sustenance, luxury and life itself. I have not come to you, however, to deal with the esthetical side of our subject, but rather hope to confine myself to the most practical thoughts and ideas relating to breeds and the breeding of dairy cows. This will not be eliminating the esthetical altogether, however, for what is more beautiful than the dairy cow, unless it is a herd of them?

With all that has been said and written regarding breeds and with the number of pure-bred animals it is possible to see in the country, it seems hardly necessary for us to spend any time discussing the breeds of dairy cattle. We are surprised, however, as new classes of students enter our college each year and take up the study of live stock, to find how small a per cent of them can distinguish one breed or type of animals from another. Inquiries which come to us through correspondence from older men, also reveal the fact that much ignorance prevails as regards distinct breeds. It is a shame that so much gross ignorance prevails among our American people relative to the breeds of live stock which furnish us our greatest source of wealth. It is true that this ignorance accounts for the large number of inferior, promiscuously-bred animals to be found in our country, and we cannot hope for a rapid improvement in the condition of affairs until men exert themselves and learn to appreciate and understand breeds and the necessity for good breeding as well. Pat, the witty Irishman, when once asked what he would be if he were not an Irishman, replied: "Sure, man, and I'd be ashamed." The man who is attempting to handle dairy cattle, or any other class of live stock and who would breed anything other than good grade or pure-bred animals about which he knew and could talk intelligently concerning, ought to be ashamed; ashamed to the extent that he would hang his head in remorse before the cow to whom he had permitted to be born a calf which had no distinct breeding.



Breeds stand for distinct meaning. They are the result of carefully laid plans and high ideals which have been moulded into realities in the form of animals highly adapted for serving their purpose most nobly. For examples, we have the Jerseys, a breed developed on the Isle of Jersey, from which it has spread extensively, producing animals beautiful in form, bright and alert in disposition, and useful in producing milk of the highest quality, thus making the breed a very satisfactory one for the breeder, who will breed Jerseys and cater to people who would have no other. Next we have the Guernseys, a size larger in body, weight and capacity, yielding milk of excellent quality and excelling the Jerseys in quantity produced in proportion to their size and capacity. Developed on the Isle of Guernsey and closely related to the Jerseys, they have many of the same characteristics, but the Guernsey people have given special attention to performance at the pail and less attention to the matter of beauty of form, resulting in a plainer looking animal, perhaps, but one which is capable of surpassing all other breed representatives in the production of butter. Again we have the Ayrshires, a breed developed in the southwestern part of Scotland, where the climate and general environment has been such that hardihood has been developed with other breed characteristics which distinguish Ayrshires from other breeds. The Ayreshire is a good cow, both in the quality and quantity of milk she produces. Carefully selected, she is a rival to the best of our dairy breeds. In the country of Holland, in the districts known as North Holland and Friesland, bordering on the North Sea, where large quantities of butter and cheese are produced and where rich dyke lands furnish an abundance of pasture, we find the home of our largest breed of dairy cattle, namely, the Holstein-Freisian, more commonly called the Holstein. With a large capacity for succulent juicy feeds and other roughage, and possessing a constitution which will endure heavy grain rations being fed in addition to roughage, the Holstein holds the world's record for milk production. The quality of the milk produced by the Holstein cow is often criticized, but she usually makes up in quantity what she lacks in quality, and

she represents one of our standard dairy breeds, entitled to a place in many sections of the country.

The four breeds mentioned may be considered our standard dairy breeds. They have been developed, not in a promiscuous manner, but by careful methodical selection of cattle possessing features of form and characters highly adapted for milk production and meeting the requirements of classes of people whose environments and preferences are not the same. They are distinguished from one another by breed characteristics such as color markings of a distinct nature, certain individualities, as regards form and general adaptability, and the points of difference relating to milk production, all of which are as important in the development of breeds and as necessary to preserve as are the trade marks which brand and characterize different grades of merchandise. Every herd of cows has its trade mark and a good stockman will interpret its value thereby nearly as accurately as we interpret the value of a piece of coin bearing a specific mark.

How about the goods we as dairymen are handling? Do our herds bear a trade mark which indicate a distinct breed of cows which tend to improve and build up the most profitable herd of dairy cows? Too many of us know well enough that there are comparatively few herds of dairy cattle, and other classes of stock as well, that are being bred and managed in a manner which will insure the largest number of profitable animals. The majority of cattle found in the country today and which are being bred, are common natives or scrubs. There are signs of improvement, we are glad to note, but a man must be very optimistic in his views who will say the improvement is all it should be.

What are we going to do about it? One thing is certain. We are not always going to be able to produce poor unprofitable cows and maintain them in our herds when lands are rising in value each year and our farming operations must necessarily become more extensive in order to make ends meet. We shall soon be compelled to wake up to the fact that we must have better cows or else get out of the business.

Is there any difference in cows? There certainly is, and here

are the records of ten cows which I had the pleasure of visiting recently. There were other cows in this herd which are doing equally as well, but I was interested in taking the records of these ten for the reason that they all belong to one particular family, thus exhibiting what blood and breeding will do. This herd receives kind treatment, good grass pasture when in season, alfalfa and clover hay and corn ensilage, supplemented with grain rations adapted to the needs of each individual cow. Let us take these records home with us and compare them with what our cows are doing, and thus note if there is any difference in dairy cows. The records are as follows:

Production for one month:

Yeksarose, aged 2 years, 1060 lbs. of milk, 50.69 lbs. of butter fat, equivalent to 59 lbs. of butter.

Production for nine months:

Buckthorn's Maid, aged 3 years, 8071 lbs. of milk, 364.32 lbs. of butter fat, equivalent to 425 lbs. of butter.

Yeksalulu Lady, age 3 years, 9075 lbs. of milk, 447.66 lbs. of butter fat, equivalent to 522 lbs. of butter.

Production for ten months:

Fannie O. K., age 8 years, 9165 lbs. of milk, 495.58 lbs. of butter fat, equivalent to 578 lbs. of butter.

Verna of Hazelwood, age 9 years, 10,159 lbs. of milk, 473.12 lbs. of butter fat, equivalent to 551 lbs. of butter.

Production for eleven months:

Yeksamine, age 3 years, 8734 lbs. of milk, 409.83 lbs. of butter fat, equivalent to 478 lbs. of butter.

Duessa, age 4 years, 8321 lbs. of milk, 405.37 lbs. of butter fat, equivalent to 473 lbs. of butter.

Production for one year:

Rose Yeksa, age 4 years, 7732 lbs. of milk, 412.53 lbs. of butter fat, equivalent to 488 lbs. of butter.

Yeksa Belle, age 8 years, 10,232 lbs. of milk, 598.06 lbs. of butter fat, equivalent to 488 lbs. of butter.

Yeksa Sunbeam, age 10 years, 14,920 lbs. of milk, 857.15 lbs. of butter fat, equivalent to 1,000.2 lbs. of butter.

The last cow mentioned holds the world's official record for the highest yearly production of butter. All of the cows mentioned will make excellent yearly records, and we as Badgers are proud of this dairy herd owned by Mr. Fred Rietbrock, Athens, Wisconsin, a man who came here to believe there was something in a breed and in the breeding of cows. Awake to this fact, he set about to establish his herd by picking up the best cows he could find, selecting as many of the Yeksa family as it was possible to find and his success is marked by the cows whose records I have quoted and others which he owns equally as good. But I hear some one say, "I cannot afford to buy such cows." The truth is that you cannot afford to buy any other kind, if you know where to find the good ones. The cow Yeksa Sunbeam cost Mr. Rietbrock one hundred dollars, and where is there a dairyman who could not afford to pay this price for such a cow. You could not buy Mr. Rietbrock's cows today for any such money, for the reason that they are in the hands of a man who knows their worth and would not part with them. If you thoroughly understand who would not part with them. If you thoroughly understood your business you perhaps could not go out and be as successful in buying cows as Rietbrock has been, for we must admit that buying cows is to a considerable extent a lottery, but I am thoroughly convinced that it would be a much less lottery if more attention were paid to breeds and breeding. We cannot all go out and buy cows of the highest type for the reason that they are not plentiful, but we can all do something toward breeding them. In passing to the subject of breeding, permit me to add that there are other breeds of cattle possessing more or less merit as dairy animals which I have not mentioned. The four mentioned I believe in firmly as dairy animals. The other breeds have their distinct trade mark and can be easily known as regards their merits and adaptability. In the strictly dairy sense they are not to be classed with those already mentioned.

#### Breeding.

Stock breeding relates to the reproduction and improvement

of animals, at least maintaining so far as possible all the good results which have been achieved in animals of a high standard. In successful practice it become an art. It is a sacred term and should only be applied to such operations, back of which there is a motive to obtain a higher standard of excellence. To rank as a breeder we must fix in mind high ideals. If we are to breed dairy cows we should have in mind such a cow as Yeksa Sunbeam, perhaps, which will produce a thousand pounds of butter in a year, or perhaps such a cow as old Pietertyre Second, which produced 30.318 pounds of milk in a year. Having fixed our ideal in mind we must proceed to bring it to a reality by selecting as far as possible animals which conform to our ideals. Pure blood, without exception in the sire and as much of it as we can get in the cows, should be used. Mating animals so as to correct defects and culling out those which are altogether unprofitable, should be practiced rigorously. Due regard should be given the matter of properly caring for animals, providing the proper feed, shelter and other means for normal growth and development.

With all of these fundamental principles there is nothing more important than the matter of persistent or "stick-to-itiveness." There are many disappointments and many obstacles which can be overcome only by the most persistent effort. The son should take up the work of the father and the work carried on in this manner for generation after generation, if the best results are to be secured. With the interest that stock raising creates in the home affairs, where the operations are based upon producing something of an improved and distinct type, there is not the difficulty in forming a partnership firm of father and son, there is where father is merely producing cows, which have to be milked twice daily, regardless of even the profits, which is the case in so many instances.

Where are we at? It is hoped that we are still in our right minds and possessed with a high ideal as regards the dairy cow. Let us remember that low aim is crime, and to hit the the mark at long distance range we must shoot high. What have we got to start with? Some of us may feel discouraged as we think of



the old herd at home, but why? One or more cows and a bull is all we need, and if we do not have the bull and do not feel we can afford to buy him alone, let us get our neighbors to help buy him for their use as well as ours. In the breeding proposition there is great gain. It is one instance where one and one make three, or perhaps four or more, instead of two. There is no reason why anyone of us with a herd of cows which are any good whatever cannot have a herd as good as can be found in the country, so far as production is concerned, if we have the firm determination that we will get it. But will we get it? Will it be by breeding our cows one year to neighbor A's beef bull, another year to B.'s scrub bull of no particular breeding, and another year perhaps to C's dual-purpose Shorthorn? No, never. In doing that we are crossing purposes as well as cattle, and it makes the intelligent man cross to think about it.

The bull is the one important animal in the improvement of cattle. Through him improvement must come. The use of a good pure-bred bull of a distinct breed, for four or five generations, gives high grades which are practically pure-bred animals of his kind, and where the breeding has been first-class, we cannot expect only better performance from pure-breds than from the high grades. Using a pure-bred bull on our native or common cows gives us a generation of half-bloods. The next generation will possess three-quarters of the blood of the sire, the next seven-eighths, the next fifteen-sixteenths, and so on until we have practically one hundred per cent of the blood of the breed with which we choose to commence.

The selection of the bull is very important and should be given most careful consideration. The fact that he is a pure-bred animal should not constitute all of his qualifications. He should come from a family noted for its strong milk producing qualities. He should be a strong, vigorous individual, having as many points of a dairy animal as possible. If selected for immediate service, he will be all the better if he is three years old or over. If he is a calf, he should be grown until he is two years of age before he is given any service to speak about. If on the

quiet he breeds six or eight heifers between the age of fifteen months and two years, has chances of becoming a great sire are somewhat lessened. Between the age of two and three years he should not be allowed to serve more than twenty or thirty cows. The common practice is to use bulls too young and discard them at the first indication of their having a little too much vigor by resenting the ill treatment which they are often given. Bulls properly grown, not put to service too young, and treated kindly, yet in a safe manner, are most valuable between the age of three years and the time they become inserviceable, which may not be before they are fifteen or eighteen years of age. After they reach an age to have daughters which prove their worth as getters of high producers, they become illustrious sires and are invaluable. Nor should their daughters be forced into service too young. A heifer needs time to grow and build a body and a constitution which will be equal to heavy work and endurance until she is twelve or fifteen years of age. Too many of our cows are small, delicate and short lived, owing to motherhood being forced upon them too young. Two years of age is plenty young for any heifer to produce her first calf. The age of thirty months may be considered better.

Having regard to the proper mating of animals, after we have fixed in mind the fundamental principles relating to live stock improvement, constitutes the art of breeding. Results come from mating through the great law that like produce like. Every line of blood carries with it certain tendencies and characteristics, and by the use of that blood we can expect these tendencies and characteristics to be transmitted.

In pure-bred animals these tendencies and characteristics have been more or less firmly fixed through years of established breeding, hence the value of pure-bred animals as compared with grades and the necessity for using pure-bred sires. It should be remembered, however, that there are many pure-bred animals which are no better than grades or common natives. In many instances pure-bred animals are improperly developed, or perhaps they are the result of mating young heifers and young bulls

whose merits are never known and whom worth perhaps does not entitle them to a place in any herd. The breeders of pure-bred cattle needs to practice rigorous selection and most careful management in his operations to avoid the production of this poor class of pure-bred animals. Too close breeding, mating animals too closely related, is another source of poor individuals among pure-bred or even grade animals. This leads to the discussion of close breeding.

#### Close Breeding.

Can a bull be used on his own daughters? Is it a good practice to use any sire on his own daughter? Will there be any harm in breeding the dam to her own son or mating own brother and sister? To what extent can close breeding be practiced without any injurious effects? These are inquiries which come to our notice frequently and are discussed under the subject, Among breeders who have been close observers and successful in practical breeding operations there is much controversy regarding the subject of close breeding, which in a general sense refers to the mating of animals more or less closely related. The subject as yet has never been thoroughly worked out in a manner to cause all authorities to agree as to just what extent or limit this system of breeding can be practiced. No man practices it intelligently without some question or doubt in his mind as to results. This is true for the reason that disastrous results do often accompany the practice and in the human family we know that the divine law forbids incestuous marriages which is another term referring to the impropriety and unlawfulness of uniting blood which is closely related.

In the breeding and improvement of many of our best breeds of live stock, it will have to be admitted, however, that many good results have been achieved by close breeding for at least a time. In the formation of breeds it was almost necessary for breeders to practice in-breeding and in some instances to keep it up for several successive generations, which in the true sense was in-and-in-breeding, the terms in-breeding and inter-breed-

ing usually referring to merely one act or single instance of bringing together blood of close relationship. It was necessary to do this in the early days of the modern improved system of breeding in order to preserve the most desirable types and fix them into a permanent form that would enable them to be transmitted with a degree of certainty. Thus the office of close breeding in those days was to intensify certain desirable characters and hasten the development of a large number of superior animals of an improved type.

With our principal breeds thoroughly established as they are today, there is not the necessity for close breeding there was one hundred and fifty years ago, nor can it be practiced as it was then. The longer a breed exists the more intensified its blood becomes and the more danger there is of some of the evils which are sure to follow where close breeding is practiced to a greater or less extent.

As stated before, the office of close breeding seems to be to intensify the transmission of characters. The chief difficulty is that weaknesses, such as tendencies to barrenness, impotency, reduced fecundity, and diseases are as apt to be intensified as are some of the strong features. It is not always possible to know the exact tendencies of an animal and in this respect one takes chances in attempting to intensify what may seem strong and desirable characters. The writer has observed in several instances where mating two closely related animals, apparently strong and robust, resulted in a marked reduction of size and strength on the part of the offspring, showing a tendency toward delicacy which did not warrant a second attempt. On the other hand, remarkable animals are known which are the result of very close breeding. Those who argue strongly against this system of breeding make the statement that where one superior animal is produced as the result of close breeding, many inferior ones are produced. It is difficult to collect data which will vouch for such statements, for the reason that breeders are very loath to report failures in their operations, and do not usually make known the sacrifices necessary for securing a few excellent individuals.

It is the belief of many of our best authorities that where in-breeding or inter-breeding is practiced, which relates to a single act of mating together animals which possess from fifty to one hundred per cent of the same blood, chances are perhaps equal for good or bad results. It is probably true, however, that in the hands of the inexperienced stockmen the chances for bad results are perhaps considerably greater. Where animals of different generations, related within the degree of second cousins, are mated twice or more times in succession, which is strictly in-and-in-breeding, the progeny is quite sure to be weakened in a more or less marked degree by some of the evils accompanying close breeding.

Line-breeding is a popular system of breeding practiced by many of our best breeders of today. It is somewhat difficult to know just what the term implies, for the reason that as it is practiced by some men it is the purest form of in-and-in-breeding. On the other hand the practice refers to mating animals belonging to a certain family or perhaps to several families, which are not so closely related as to cause any danger of evil results. The latter practice is in accordance with the original idea which was adopted by men who realized the evils of in-and-in-breeding. Wisely and judiciously practiced, it tends to preserve a given type and a performance which could not be so readily assured by natural or ordinary breeding. Animals to be mated are carefully and judiciously selected in every instance, and rather than take too great chances of getting disastrous results by uniting blood too closely related an out-cross will be made by using the blood of some other family which the breeder has faith will nick well with what he has succeeded in producing and is trying to preserve.

There are wonderful opportunities for the painstaking intelligent man to achieve success and profit out of breeding operations. Close breeding in one form or another is one of the means to be used in reaching such an end, but it is not the end itself and cannot be generally recommended for this reason. There are many instances where it will only prove a detriment rather



than a help. When a man thoroughly understands the principles of breeding and all the details relating to the selection, care and management of animals the writer believes that the system of line-breeding, perhaps to the extent of in-breeding in a few instances, is a useful and helpful one, where close breeding is practiced, for the reason that the farmer can save the trouble and expense of changing sires, and where undesirable characters or perhaps tendencies toward the same are present the system should be discouraged altogether, as it is sure to produce disastrous results.

This lengthy article does not deal with all that relates to successful live stock breeding. It is hoped, however, that it may offer some inspiration to enable us to go to work and raise the standard of excellence in our dairy herds. Let us remember that in-breeding plants or animals any achievement along the line of improvement presupposes and does mean farther achievements along that line, and on the other hand, any deterioration presupposes and means farther deterioration.

(Flashlight picture taken of stage on which were separators and agents representing them.)

By the President (at close of paper:—Are there any questions any one would like to ask Mr. Humphrey in regard to this subject?)

I would say that this afternoon we have on the program Mr. Mason, of Elgin, Mr. Hill, of Michigan, and two gentlemen from the University. I also notice in the room the Hon. C. J. Lindley, and possibly we can get him to say a word or two.

We will now adjourn until 1:30 o'clock sharp.

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Thursday, 1:30 P. M.

President in the chair:—We will now have the report of Committee on Resolutions.

## RESOLUTIONS.

To the President and Members of the Illinois Dairymen's Association :

Gentlemen—We your committee on resolutions beg leave to submit the following partial report, viz. :

That in order that our official name may correspond with the generally used name of our association, we would recommend that Section 1 of our By-Laws be amended by prefixing the following sentence to the section, as it now reads, viz. : that "This association shall be known as the Illinois State Dairymen's Association ; further

Resolved, That the Board of Directors elect be empowered to take such legal steps as are necessary to secure the legal change in name.

Respectfully submitted,

Walter R. Kimzey.

D. C. Haeger.

F. G. Austin.

It is moved and second that this resolution for change in name be adopted.

Are you ready for the question? It is simply adding the word "State" to our name.

All in favor say "I." Contrary. It is carried.

Resolved, That the thanks of this association are especially due the press of Effingham for their successful efforts in arousing the farmers of this section to the importance of this meeting and for their full accounts of the different sessions of the association ; to the farm and dairy journals in general for the publicity they have given this meeting, without which we could not have had so great and successful a gathering.

Resolved, That we extend a vote of thanks to the citizens of Effingham for their hospitable welcome, and especially to them and the Commercial club for the pleasurable occasion Wednesday evening—an event standing out as one of the bright spots in the history of the association.

Resolved, That our thanks be extended to those citizens who have added so much to our program by musical selections, both vocal and instrumentl.

Resolved, That the thanks of this association are due W. E. Janes, of Hinsdale, for shipping the Brown Swiss cow, and to F. G. Austen, of Effingham, for the Holstein cow, both of which were used for class work in the association.

Resolved, That it is the sense of the Illinois State Dairymen's Association, in convention assembled, that a discrimination has been made against the Brown Swiss cattle, in excluding them from participation in the coming National Dairy Show, on the grounds that they are other than dairy cattle.

The breeders of the cattle have entered them as such in competition test at St. Louis, at the Pan-American demonstration at Buffalo and at the Illinois State Dairymen's Associaiaon competition test at Springfield, and up to t his time no objection has ever been made to such entries, and it is the sense of this meeting that inasmuch as the breeders of Brown Swiss are willing to exhibit them on their merits as dairy cattle we request that a class be made for them at the coming National Dairy Show.

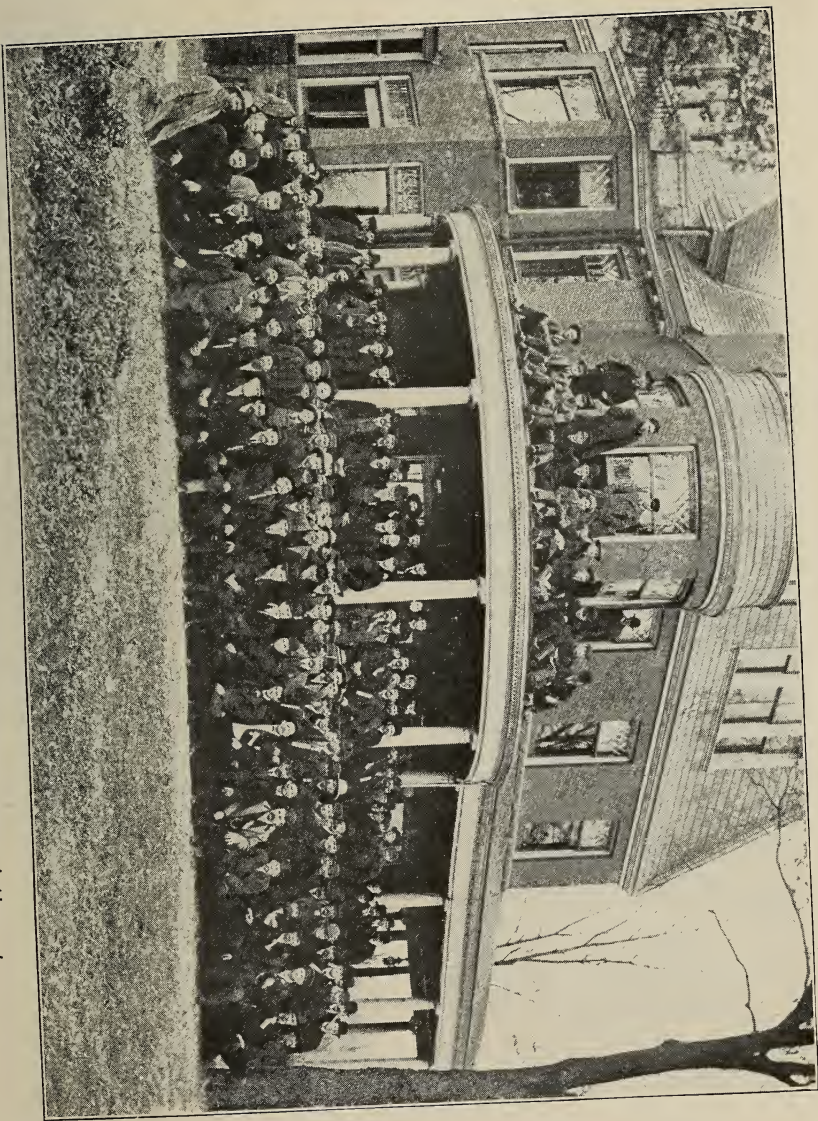
Realizing the practical benefit to dairymen resulting from the exhibition at fairs of working dairy cows, in addition to those specially fitted for the ring show; therefore be it

Resolved, That we recommend the action of the Board of Directors in offering medals for the four classes of dairy tests at the last State Fair, and that we do hereby instruct the Board-elect to offer special premiums for the coming fair; and be it further

Resolved, That as the rule requiring a mininum of five entries in these classes may work an injustice upon exhibitors from a distance, we instruct the board to eliminate the requirement of a specified number of entries.

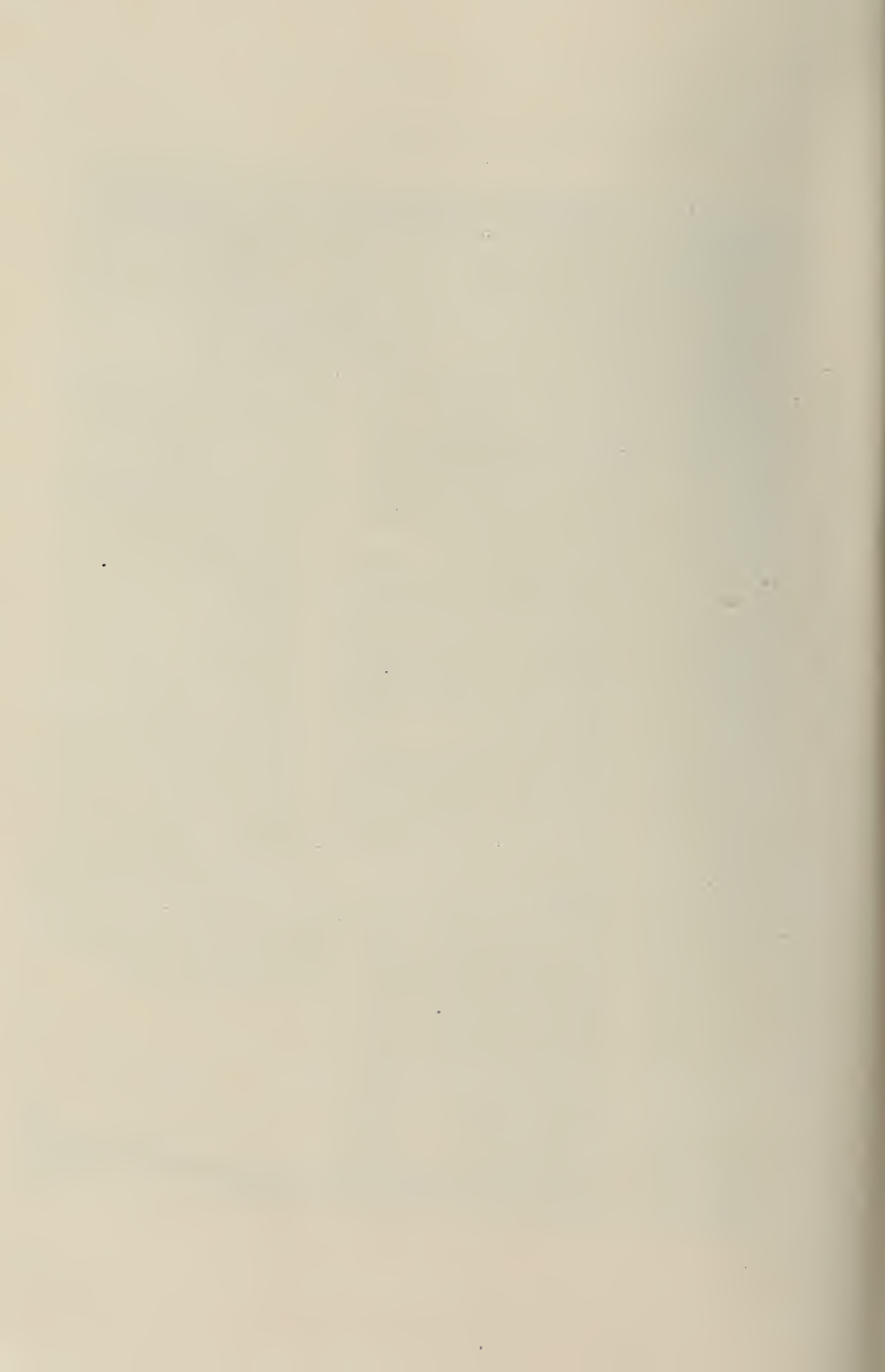
Recognizing in the Milk Producers' Association of Chicago an organization working for the betterment of dairy interests in common with our own association,

Resolved, That the Secretary of this association be instructed



Delegates to Convention of Illinois State Dairymen's Association at Effingham, Visiting at Bissell's College of Photography.







to correspond with the Secretary of the Milk Producers' Association and offer to print their proceedings in the volume containing the proceedings of this meeting.

In view of the efforts of certain unscrupulous manufacturers to place adulterated and impure dairy products upon the market under the guise of the genuine article, be it

Resolved, That this association urge that the provisions of the law providing that the Assistant Pure Food Commissioner be a dairyman, be complied with; and be it further

Resolved, That the President of this association correspond with his excellency, Governor Deneen, relative to this matter, and that he be instructed to go in person to Springfield, should he deem such action would assist in securing the appointment of a suitable Assistant Pure Food Commissioner and inspectors under the Pure Feeding Stuffs bill.

As the dairy interests of this state have grown to such great proportions, embracing so diversified a variety of interests that "specialization" along certain lines appears desirable, therefore be it

Resolved, That the President appoint a committee of not less than five to consider the advisability of organizing a Butter Makers' Association, and should they deem it advisable, to arrange a program to be held in connection with the next State Dairymen's Association; and further

Resolved, That the above committee consider the advisability of providing "sectional meetings" for the different dairy interests at some of the sessions of the next annual meeting.

Resolved, That the Illinois Dairymen's Association owe much of its present high standing to the untiring efforts of Hon. Joseph Newman, retiring after five years' consecutive service as President of the association, and that the thanks of this association be extended to him and our worthy Secretary, George Caven;

Resolved, That our association recognizes the importance of a pure food law, and more especially the importance of a uniform national law regarding pure foods, and that we pledge our

earnest support to any action towards securing the passage of such a law, both state and national.

Resolved, That the efforts of the National Dairy Union for securing the sale of all bogus butter under its true name deserves our undivided support; that we condemn the Grosvenor bill now pending in congress, looking to the nullification of the present law regarding oleomargarine; and that we aid in every way possible the efforts of the National Dairy Union in protecting our dairy products.

Resolved, That we appreciate the work done by the College of Agriculture towards the betterment of dairy conditions in this state, and in view of the rapid growth of the dairy interests we would respectfully ask that the force of competent field men for the coming year be largely increased.

Respectfully submitted,

Walter R. Kimsey,

D. C. Haeger,

F. G. Austen,

Committee.

It is moved and seconded that the resolutions be adopted as read. Are you ready for the question? It is all right, but the throwing of the bouquets at individuals. All in favor say "I." Contrary. Then it is carried.

By the President:—Any further resolutions to be acted on at this time?

A:—None that I know of.

By the President:—We will now listen to Prof. Hayden, of our college.

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**THE IMPORTANCE OF LEGUMES IN THE RATION OF THE  
DAIRY COW.**

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By C. C. Hayden, University of Illinois.

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Gentlemen of the Convention:

I am requested to make my talk quite short, as there are

more on the program, and I expect to do so. I have prepared a paper and shall read it. It is along feeding lines and have condensed it as much as possible to make myself plain and I see there is another speech to come on the question of feeding the dairy cows.

Care, breeding and feeding are three factors which determine the results obtained in any line of animal production.

The degree of success attained in any branch of animal industry varies in proportion to the attention given to these three factors. This is especially true in the feeding of dairy cows.

In earlier times when our domesticated animals were permitted to roam through the fields and forests and to a great extent select and gather their own food, there was little special development or specialization of function. Self-preservation was the motive, or instinct, and the "survival of the fittest" the rule. The survival of those animals best suited to live under those conditions and not those best suited to the needs of man.

There was little or no development of high speed, choice beef cuts, or abnormal milk yields. Within recent years man has, gradually, by systematic methods, developed such abnormalities as Dan Patch, Aggie Cornucopia, Pauline (34.331 lbs. fat in 7 days), or Yeksa Sunbeam and many others which might be mentioned. Nowhere is this development more marked than in dairy cattle. Such animals have been adapted by man to his special purpose. This great change has been brought about only by changing the conditions surrounding the animals and by care in breeding.

Along with other changes necessarily came great changes in methods of feeding. It became necessary to adapt the foods to the special needs of such specialized animals. Dan Patch could not have been expected to develop such speed if he had been fed on corn and oat straw, or if he had been bred without any regard to such development. Neither could Pietertje Second have produced over 30,000 lbs. milk in one year, nor Yeksa Sunbeam 14,920 lbs. milk and 857.15 lbs. fat in one year, if fed nubbins of

corn and timothy hay or corn stover, which are fed by too many of our so-called dairymen.

We must not lose sight of the fact that the kind, character and amount of food to be supplied depends upon the use to which it is to be put by the animal.

An idle horse, a steer, or dry cow can be wintered on food which would not answer for a horse at hard labor, a fattening steer, or cow giving a large flow of milk.

In order that an animal may carry on, to the best of advantage, the work required of it, it must be supplied with the proper kind and amount of foods best adapted to its purpose.

In feeding for speed, we must provide foods which are not too bulky and which furnish materials for a large amount of energy. If we expect an animal to lay on fat we feed materials containing large amounts of nutrients which go to make fat. If we are feeding for milk production, we must feed materials containing a sufficient amount of the nutrients found in milk.

In one respect, practically all food materials are alike. They all contain the essential food elements or nutrients. The five important of these are: water, ash, carbohydrates, fats, and proteids. If all foods contain all these, why are not all foods suitable for all feeding purposes? Because they differ widely in percentage composition and also in their physical characteristics; nor are these nutrients equally digestible in all kinds of food.

Let us examine these nutrients and see why their proportion in any given food is of importance. The first mentioned was water, which is abundant and free; hence need not be considered. The second is ash, which is usually present in sufficient quantities in ordinary foods, and can, for this reason, be ignored. The third is the carbohydrates, which includes the starches and sugars. The fourth is the fats or oils. The fifth and the one of most importance to us in this discussion is the proteids or albuminoids, which are well represented by the white of eggs.

The following table will show the part played by these different nutrients when taken into the animal body :

| NUTRIENTS.   | PART PLAYED IN BODY.   |
|--|--|
| 1. Carbohydrates.<br>C. H. O.<br>Ex. { Sugar.<br>} Starch.       | { Transformed into heat—Body temperature.<br>Transformed into energy—Work.<br>Stored up as fat in the body.<br>(Can replace fat in food.)  |
| 2. Fats.<br>C. H. O.<br>Ex. { Oils.<br>} Tallow, etc.            | { Transformed into heat—Body temperature<br>Transformed into energy—Work.<br>Stored up as fat in the body<br>(Can largely replace carbohydrates.)<br>Enters into the formation of muscle,tendon,<br>connective tissue, hoofs, horns, hair, etc.,<br>in the growing animal. |
| 3. Proteids.<br>C. H. N. O.<br>Ex. { Albumen.<br>} White of egg. | { Repairs or replaces waste tissue in the body.<br>Forms casein and albumen in milk.<br>(Possibly replaces, to some extent both car-<br>bohydrates and fats.   |

You will note from this table that the proteids contain the element nitrogen (N), which the others do not, and which is its distinguishing feature. All three contain carbon, hydrogen and oxygen (C. H. O.) Heat, energy and fat in the body, or fat in milk, comes from these three elements; hence all three groups of nutrients can supply this need to at least some extent. The formation of muscular tissue, or lean meat, and the casein and albumen of milk require the element nitrogen and therefore, can not be formed either from carbohydrates or from fats, but require some form of proteid. Besides entering into the composition of the tissues mentioned above, nitrogen is very closely connected with the life processes of the body. In no other class of animals is this need of protein so great as in the case of the dairy cow, because of the large amount necessary to the formation of proteids in the milk.



Let us examine the composition of milk and see the prominent part taken by proteids :

|      |   |  |         |        |
|------|---|--|---------|--------|
| MILK | { | Carbohydrates=<br>Lactose or<br>Milk Sugar | }       | 4.88%  |
|      |   | Fats =<br>Butter Fat                       | }       | 3.70%  |
|      |   | Proteids =<br>Casein<br>Albumen            | }       | 3.40%  |
|      |   | Ash  |         | .70%   |
|      |   | Water                                      |         | 87.32% |
|      |   |  | 100.00% |        |

It will be noted that in every hundred pounds of milk there are 3.4 pounds of proteids, or over 26 per cent of the total solids in milk.

The young and growing animal which is constantly building up new tissue, and the cow giving milk, demand more protein than is necessary for the maintenance of the adult animal. It has been estimated, or rather determined by experiment, that an adult animal weighing 1,000 pounds requires about .7 lbs. protein, 7 lbs. carbohydrates, and .1 lb. fat, to maintain its body in good living condition; 26 pounds of average milk contains nearly one pound of protein. From this it is evident that a cow of the above weight, giving 3 gallons of average milk daily, must be supplied with about 2 pounds of digestible protein in her daily ration. As the flow of milk increases, the supply of digestible protein must be increased. It is now believed that the cow giving a medium amount of milk should be fed a ration in which there is one pound of protein to about 7 pounds of carbohydrates and fat, (the fat reduced to the basis of carbohydrates, and that the proportion of proteids should be increased as the flow of milk increases. The ratio of these nutrients in milk, itself, is about 1:3.

Now let us examine our common foods and see which are the best adapted to furnish this protein.

The following table shows the percentage of digestible protein in our common foods:

| Concentrates. |       | Roughage.   |       |
|---------------|-------|-------------|-------|
| Corn meal     | 7.8%  | Corn stover | 1.7%  |
| Bran          | 12.2% | Timothy hay | 2.8%  |
| Oats          | 9.2%  | Oat hay     | 4.3%  |
| Oil meal      | 29.0% | Straw, oat  | 2.2%  |
| Gluten meal   | 25.8% | Red clover  | 6.8%  |
| Gluten Feed   | 20.4% | Cowpeas     | 10.8% |
|               |       | Alfalfa     | 11.0% |
|               |       | Soy beans   | 10.8% |

It will be noted that our common grains grown on the farm are comparatively low in percentage of digestible protein. Those foods which are high in digestible protein are either by-products from the manufacture of other articles or they are the leguminous crops raised on our farms. The capacity of even the dairy cow to digest and assimilate food is limited, and it would require an amount of some foods far too great for the capacity of even our best cows to supply the necessary amount of digestible protein. Let us see the amounts of these foods required to furnish an average amount or 2 pounds protein daily:

| Concentrates. |           | Roughage.      |            |
|---------------|-----------|----------------|------------|
| Corn meal     | 26.0 lbs. | Corn stover    | 118.0 lbs. |
| Bran          | 16.4 lbs. | Timothy hay    | 71.4 lbs.  |
| Oats          | 21.0 lbs. | Oat hay        | 40.0 lbs.  |
| Oil meal      | 6.8 lbs.  | Oat straw      | 166.6 lbs. |
| Gluten meal   | 8.0 lbs.  | Red clover hay | 29.4 lbs.  |
|               |           | Alfalfa hay    | 18.0 lbs.  |
|               |           | Alfalfa hay    | 18.0 lbs.  |
|               |           | Cowpea hay     | 18.5 lbs.  |
|               |           | Soy bean hay   | 18.5 lbs.  |

A glance at the above will show us at once that it is not practical to feed a cow on corn alone. It would be necessary for the ordinary cow to eat 12 pounds of corn meal and 59 pounds of stover. Corn and timothy hay would not be much better. What cow could be induced to eat 12 pounds of corn meal and 35 pounds of timothy hay?

Imagine, if you can, a cow getting on the outside of 11 pounds of oats or 12 pounds of corn meal and 96 pounds of oats

straw per day! If it were possible for cows to consume such rations, they would not be palatable and palatability is an important factor.

From what has been said, I think it will be evident that a large amount of protein is necessary in the ration, and that to supply this our foods cannot be fed indiscriminately. We must feed those foods high in digestible protein with those low in digestible protein; in other words, we must balance our ration by combining materials high in protein with those low in protein. Then we must combine our common grains with some roughage low in protein, or we must combine our common by-products high in protein, or we must combine our common grains with some roughage high in protein. Which shall it be? In other words, shall we grow our own protein on the farm or shall we pay some corporation a high price for their by-products?

The common method at present is to use such concentrates as bran, gluten meal, gluten feed, oil meal, etc. This necessitates a large outlay on the part of the dairyman and if he can raise his protein at home in the form of legumes, why not do so?

The question now arises, can we substitute these legumes for the high-priced concentrates, such as bran, gluten meal, etc. Look again at the tables and you will see that the composition of bran and alfalfa hay are not very different as far as digestible nutrients are concerned. Theoretically, they are nearly equal, pound for pound. They can be substituted in theory: How is it in practice? The Tennessee Experiment Station finds by experiment that alfalfa can be substituted for bran in the ordinary ration to a very good advantage. A number of cows were fed a ration of silage, bran and cotton-seed meal. Another lot was fed silage, alfalfa and cotton-seed meal. The best results were obtained from the ration containing the alfalfa. From the ration containing the bran milk was produced at a cost of 7.1 cents per gallon, while from the ration containing the alfalfa, milk was produced at a cost of 5.7 cents per gallon. (Bran \$20.00, alfalfa \$10.00.) Practically the same amount of bran and alfalfa were fed during the experiment. They estimated that there was a

saving of 19.8 cents on every 100 lbs. of milk produced. If alfalfa hay can be grown on your farm, it can be grown at a less cost than \$10.00 per ton while I doubt if you can secure bran for much less than \$20.00 per ton.

The same station also found that cowpea hay was practically as efficient as alfalfa. Cowpea hay can surely be produced in this section for less than \$10.00 per ton. Let us figure a little. In a ton of bran there are 244 lbs. of digestible protein, and in a ton of alfalfa there are 220 lbs. of digestible protein. Only one-ninth more protean in the bran and yet it costs twice as much. It is possible that the protein in the alfalfa is not quite as efficient as that in the bran, because more nutrients are used up in the process of digesting the coarser materials; but this difference, by no means, makes up for the difference in price.

The Maryland station also found that a ration of alfalfa hay and corn meal produced more milk than a ration of corn silage and concentrates high in protein.

The same station has also shown that cowpea silage and corn meal are superior for milk production to corn silage and concentrates high in protein.

This does not necessarily mean that it would be cheaper to substitute cowpea silage and corn meal for corn silage and concentrates high in protean, because it is more difficult to get a large quantity of good cowpea silage than of corn silage. However, all this tends to show that there is a possibility of substituting, to a very large extent, home-grown crops for the high-priced concentrates. There is (however, a limit to this substitution, because of the bulky nature of the legume hay. Cows giving a very large quantity of milk would require some concentrates high in protein, but it stands the dairy farmer in hand to substitute as far as possible. The fact that the legumes are palatable is a great argument in favor of their more common use.

The important question today with the dairyman is not so much how to get a better price for his product as how to decrease the cost of production. Hitherto, the high-priced foods have been the concentrates or by-products. It is not probable that

these will decrease in price. Our future supply of bran depends upon the flour industry and will increase or decrease with it; gluten meal and gluten feed depends upon the manufacturing of starch, glucose, etc., or corn products, and will increase or decrease accordingly. Our supply of cotton-seed meal depends upon the manufacture of cotton-seed oil; our supply of oil meal depends upon the manufacture of linseed oil. Besides these being limited according to the manufacture of other products, these foods are constantly becoming more popular among all feeders and it is not probable that the supply will keep pace with the demand. It is time then that the dairyman begin to look to some other source for his supply of protein and make himself as nearly independent as possible of corporations who can and will fix their own prices. As I see it, our only hope for cheaper protein is to produce it on the farm in the form of legumes.

This is not all that can be said in favor of legumes. All the products removed from the farm carry away more or less of its fertility. The general farmer is constantly selling his farm and I take it that in this section of the state none of you have any fertility to spare.

This element, nitrogen, found in the proteids, is the most costly part of our commercial fertilizers, and perhaps the most easily exhausted from the soil by careless cropping. Potash and phosphorus can be supplied much cheaper in the form of commercial fertilizers. Such crops as corn, wheat, oats, timothy, red top, etc., are constantly removing nitrogen from the soil, which if fed to dairy cows is sold from the barn in the form of milk. A constant drain without adequate replacement means final poverty of the soil and its owner. Here again are the legumes the farmer's friend. They not only furnish him protein for milk production, but they actually add nitrogen to the soil. They bring to the farmer, gratis, his most costly fertilizer. No man is in a better position to build up his soil than the dairyman if he uses wisely the forces at his command. You cannot afford to raise timothy which impoverishes your soil and buy high-priced fertilizers for your land. Raise legumes to replace your concentrates



and add nitrogen to your soil and save both a fertilizer and a feed bill.

Some may say we can't raise these crops successfully. I say you can. I do not believe there is a farm in the state of Illinois on which clover, alfalfa or cowpeas can not be grown. One may do much better in one section than another, but I believe all three can be grown in all parts of Illinois. In this section you can easily grow cowpeas, and perhaps all your soil needs to grow clover is a little lime or a little fertilizer and inoculation to grow alfalfa. The dairyman should know no such thing as "can't" in crop growing. When he "can't" nobody else can.

In conclusion I would say: Raise legumes only for hay, corn for silage and grain; buy less concentrates; increase the fertility of your farm, to raise more legumes to feed more cows, to further increase the fertility of your land, and leave a legacy to your children.

#### DISCUSSION.

Q:—Would the cowpea excel the clover when well podded?

A:—The cowpea has ten. I will come to that a little bit later.

Q:—Corn silage comparatively low?

A:—You must remember it carries a very large percentage of water.

Q:—Wouldn't it be owing to the kind of corn you put in your silage how much of protein?

A:—Yes, sir.

Q:—What proportion would it have in that chart?

A:—Well eared corn. It is pretty hard to say. It would depend on the amount of corn in it.

Q:—Silage pretty well matured?

A:—Yes, well matured. Corn well dented and glazed.

Q:—How matured should the corn be to make silage?

A:—We want the corn, I suppose to be about the condition to cut it to shock down here. That is, glazed over, the grain

dented, past the silk really. And in fact just enough moisture to preserve well in the silo. It is a pretty hard matter to decide.

Q:—We put ours up when the leaves commenced to turn yellow and the stalks turned yellow?

A:—That's good.

Q:—What is the difference of the green clover and the alfalfa not in the hay, but in the green plant before cut?

A:—Green clover and green alfalfa; I cannot give you the exact difference.

A Member:—I think one per cent.

Q:—Why the difference between clover and alfalfa?

A:—There is not so much difference in protein, but the protein in alfalfa is more digestible.

Q:—(Referring to chart:—Is this digestible; is it ground oats or whole oats?)

A:—It would not make any difference.

Q:—How much more digestible would the ground oats be with the rolled oats with hay?

A:—I can't answer that question.

Q:—Any experiment on that?

A:—I don't know.

Q:—Would it pay to grind the oats?

A:—Yes, I think so.

Q:—Ain't your protein low on oats there?

A:—That's according to Homer's Feed and Feeding.

Q:—Any danger of feeding too much protein?

A:—It would be a waste of feed.

Q:—What is the result?

A:—I don't know any detrimental result if not too great a quantity of it. It is supposed that feeding a large amount of protein may develop a high protein waste, and you don't use the protein to good advantage; that is the same as saying a waste. Protein is the most costly part of your ration.

Q:—The excess of protein fed would be converted into heat and energy and fat?

A:—Yes, sir. The protein to some extent may take the

place of carbohydrates, but carbohydrates cannot take the place of protein. These two do not.

Q:—How many pounds of pea hay to a 800 pound cow?

A:—Depends on what else you are feeding.

Q:—Corn stover and early corn.

A:—We found cows would eat 18 pounds of it.

Q:—Any danger of feeding too much to the detriment of the cow?

A:—I don't hardly think so.

Mr. Lindley:—You can feed all the hay to your cow. There is more danger for the want of it; your cow pea hay.

Q:—The trouble with this feeding too much of cowpea is where heavily grained?

A:—Yes, sir. I don't think it should go to far; too much ripe seed in it. That's like feeding too much grain.

By the President:—You can take this up at your local meeting. We must pass on to the next on the program.

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By the President:—We will now listen to Prof. Hopper, of the University, on the Importance of Testing Cows. Mr. Hopper.

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### THE IMPORTANCE OF TESTING COWS.

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By Prof. H. A. HOPPER, University of Illinois.

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Ladies and Gentlemen:

I hardly need an introduction to this audience, especially as I have been acquainted more or less with you local people here for two years.

I have been to a great many of the dairy farms and observed the operations as made on them, studied the various conditions and watched them do them.

The object of my discussion is to call your attention to the

results of the field work carried on in southern Illinois for the past two years.

There is no one subject in which the dairymen of Illinois, or any other state, should be more interested than that of determining the productive capacity of the individual cow. All will agree that no argument is needed upon this point, yet how many of our milk producers are employing the scales and the test to point out the unprofitable cows in their herds? I am convinced that few realize the importance attaching to work of this kind. Some have a fair idea of its significance, but never begin testing because they feel that it will necessitate considerable additional work. This is an unfortunate belief, for the labor involved in testing the different cows in a herd is comparatively insignificant, while the results obtained are of great value to the owner. Men who have had their herds tested continue the work, for its value has become apparent to them. How can dairymen fail to see its importance if they but reflect that the cow is the foundation of the whole dairy industry? We may talk about the transportation of milk, the making of butter or the curing of cheese, but these are of no consequence if the coarse foods of our fields and the concentrated by-products of our mills cannot be profitably converted into milk. Why do dairymen persist in putting expensive food and labor into their herds not knowing the kind of cows they are feeding? Often if the poorest third of the herd was sold the running expenses would be reduced and the profits become proportionately greater. There are few herds that do not contain some unprofitable cows as well as others that return an insignificant profit. In all such cases a vigorous weeding out is to be highly recommended.

It is difficult to understand why dairymen who are careful about their other business affairs are so slow to see the necessity of keeping an account with the "old cow." They take it for granted that she is honest and seem loth to know the real facts in the case. It is just as essential to know how much food a cow consumes and the product she is capable of making from it as it is to know the quality of work an employe is doing and the time

he requires in which to perform it. Since this is the case we must keep a record of each cow's production and test her milk often enough to be assured of its average butter fat content. It is no hardship to weigh the milk from each cow every day and have a composite sample of the same tested at regular intervals. In this way the annual production of butter fat can be determined very closely and knowing the approximate value of the food consumed by each, it is easy to separate the profitable from the unprofitable cows. Dairymen must wake up and consider the matter seriously. Nature has been provident so far and the indifferent milk producer has not been forced to see the economic aspect of milk production in its true light. Competition is becoming more intense; he has less margin than formerly and must soon get into the harness of thought and action or out of the business entirely. I shall be able to show later that the persistent use of scrub sires and the failure to follow any systematic plan in selecting cows is costing the dairy farmers of Illinois \$16,000,000 per year. By better breeding, feeding and selection of cows this loss can be recovered in a period of four years. If, *in* the meantime, the sanitary conditions surrounding the herd are improved as they should be, the increase may be much greater.

About two years ago the department of Dairy Husbandry at the University of Illinois began dairy field work in southern Illinois. The object was to come into contact with the milk producers, through the testing of the individual cows in the different herds; thereby showing the owners how easily the unprofitable ones may be sorted out by weighing the milk from each and testing composite samples taken at stated intervals. At the same time an effort has been made to bring about more rational practices in feeding and the encouragement of methods looking toward the production of better and cheaper milk. Certain herds were selected at various places, the owners of which would consent to keep the records accurately. They were furnished scales, sample bottles and record sheets and weighed the milk from each cow every ninth week. With the exception of two herds, the weighing was done every milking throughout the year. The re-



sults obtained in this way are much more valuable than those where the owners confine their weighing to the weeks when the composite samples are taken. From these continuous milk records and the tests of the composite samples, the year's production can be determined within 5 per cent of the actual amount. The owner, knowing the kinds, approximate amounts and cost of the different foods, together with the amount and value of each cow's production, can determine very closely by this simple and practical method the comparative value of his cows. It is a matter of weighing the milk from each cow separately, keeping a record of the amounts and testing a composite sample from each cow every ninth week. The data used in the following discussion were obtained from the testing of herds in various parts of southern Illinois in the way just indicated. In all cases the herds were selected with reference to the character and standing of the owners in their respective communities, so that the records would be as nearly correct as it is possible to make them. In addition, it may be said that samples have been tested with the utmost care so that the final results are of more than ordinary value. It is but fair to those who study the figures presented, to say that in most cases the herds tested were the best or among the best in the community, yet this does not hold in every instance, for some of them were decidedly poor. This, together with the additional fact that the price of milk and butter averaged fairly high explains why so few cows were found that were actually unprofitable. The figures which are about to be presented contain abundant food for thought on the part of all, but I especially call the attention of the man with the inferior herd to the lesson they teach. Some of the figures given were obtained from herds within four miles of this hall and all were obtained from herds in this part of the state. The prices assigned to milk and butter fat are not held to be absolutely correct, yet are approximately so and assist one in comparing the value of the product of the different animals. In the discussion of the following records, it will be understood that they are for one year unless otherwise stated.

Allow me now to call your attention to Table 1—arranged to compare the production of the best cows in the different herds.

TABLE ONE.

Comparing the Production of the Best Cows in the Different Herds.

| Herd.    | No of<br>Cows<br>in Herd. | Lb. Milk | Per Cent<br>Fat. | Lb. B.<br>Fat. | Value                   | Value              |
|----------|---------------------------|----------|------------------|----------------|-------------------------|--------------------|
|          |                           |          |                  |                | Milk \$1.15<br>per 100. | B. Fat.<br>25c lb. |
| 1 .....  | 11                        | 6099.3   | 5.17             | 315.38         | \$ 70.14                | \$78.84            |
| 2 .....  | 8                         | 8738.7   | 3.81             | 333.35         | 100.50                  | 83.34              |
| 3 .....  | 5                         | 9454.3   | 3.40             | 324.08         | 108.72                  | 81.02              |
| 4 .....  | 11                        | 7445.1   | 4.82             | 358.59         | 85.62                   | 89.65              |
| 6 .....  | 20                        | 9067.0   | 4.41             | 399.47         | 104.27                  | 99.87              |
| 7 .....  | 10                        | 5506.8   | 4.70             | 264.01         | 63.34                   | 71.00              |
| 8 .....  | 10                        | 6647.0   | 3.09             | 263.42         | 76.20                   | 65.85              |
| 10 ..... | 16                        | 7291.0   | 4.31             | 314.96         | 83.84                   | 78.74              |
| 11 ..... | 9                         | 6531.0   | 3.78             | 246.70         | 75.10                   | 61.67              |
| 12 ..... | 13                        | 6429.4   | 3.80             | 248.36         | 73.93                   | 62.09              |
| 15 ..... | 12                        | 6289.0   | 4.74             | 298.57         | 72.32                   | 74.64              |
| 16 ..... | 9                         | 5292.6   | 4.49             | 237.64         | 60.86                   | 59.41              |
| 17 ..... | 7                         | 6114.5   | 3.31             | 202.70         | 70.31                   | 50.67              |
| 19 ..... | 19                        | 6412.7   | 4.57             | 292.82         | 73.75                   | 73.20              |
| 20 ..... | 16                        | 7529.5   | 3.93             | 296.09         | 86.59                   | 74.02              |
| 21 ..... | 15                        | 8882.3   | 3.75             | 332.77         | 102.15                  | 83.19              |
| 24 ..... | 9                         | 6911.4   | 6.91             | 477.3          | 79.48                   | 119.32             |
| 23 ..... | 25                        | 4337.2   | 4.96             | 215.55         | 49.87                   | 53.88              |

The best cow in herd 23, produced 4,337.2 pounds of milk, containing 215.55 pounds of butter fat, while the best one in herd 3 gave 9,454.3 pounds of milk, containing 324.08 pounds of butter fat. The latter produced twice as much milk and one and one-half times as much butter fat as did the former. You will also notice that the best cow in herd 24 produced 477.3 pounds of butter fat, which is more than twice as much as was produced by the best cows in herd 16, 17 and 23. In three of the eighteen herds reported the best cow produced more than 350 pounds of butter fat; in five, between 300 and 350 pounds, and in five the production ranged from 250 to 300 pounds. The range of butter fat production extends from 202.7 pounds to 477.3 pounds, which at the price assigned gives a possible return per cow of from \$50.67 to \$119.32. After noting this variation in the best

cows of each herd you will doubtless be anxious to see a comparison of the poorest cows in each, which is shown in table 2.

TABLE TWO.

Comparing the Production of the Poorest Cows in the Different Herds.

| Herd. | No of<br>Cows<br>in Herd. | Lb. Milk | Per Cent<br>Fat. | Lb. B.<br>Fat. | Value                   | Value              |
|-------|---------------------------|----------|------------------|----------------|-------------------------|--------------------|
|       |                           |          |                  |                | Milk \$1.15<br>per 100. | B. Fat.<br>25c lb. |
| 1     | 11                        | 4391.3   | 3.91             | 171.67         | \$50.49                 | \$42.91            |
| 2     | 8                         | 4928.4   | 3.92             | 198.29         | 56.68                   | 48.32              |
| 3     | 5                         | 6719.1   | 3.27             | 221.13         | 77.26                   | 55.28              |
| 4     | 11                        | 4091.2   | 3.83             | 156.71         | 47.05                   | 39.13              |
| 6     | 20                        | 5796.4   | 3.65             | 211.80         | 66.65                   | 52.95              |
| 7     | 10                        | 3412.1   | 3.78             | 128.96         | 39.24                   | 32.24              |
| 8     | 10                        | 2690.8   | 3.61             | 97.17          | 29.94                   | 24.29              |
| 10    | 16                        | 3846.7   | 4.38             | 168.43         | 44.23                   | 42.12              |
| 11    | 9                         | 5561.6   | 3.01             | 167.56         | 63.84                   | 41.89              |
| 12    | 13                        | 2090.4   | 4.83             | 101.05         | 24.03                   | 25.26              |
| 15    | 12                        | 3491.1   | 3.01             | 135.29         | 40.44                   | 33.82              |
| 16    | 9                         | 3751.5   | 3.99             | 150.01         | 43.14                   | 37.50              |
| 17    | 7                         | 3710.4   | 3.33             | 123.53         | 42.67                   | 30.88              |
| 19    | 19                        | 4529.8   | 3.49             | 158.07         | 52.09                   | 39.51              |
| 20    | 16                        | 4025.1   | 4.56             | 136.02         | 34.27                   | 34.55              |
| 21    | 15                        | 2980.0   | 3.55             | 143.12         | 46.29                   | 35.78              |
| 23    | 25                        | 1845.8   | 4.24             | 78.34          | 21.22                   | 19.58              |
| 24    | 9                         | 3477.6   | 4.64             | 161.46         | 39.99                   | 40.36              |

The poorest cow in herd 3 produced 6,719.1 pounds of milk, containing 221.13 pounds of butter fat, while the poorest cow in herd 23 gave 1,845.8 pounds of milk, containing 78.34 pounds of butter fat or, expressed differently, the poorest cow in herd three produced 3.6 times as much milk and 2.8 times as much butter fat as the poorest one in herd 23. The poorest cow in two of the herds produced slightly more than 200 pounds of butter fat, in eight herds the lowest production was between 150 and 200 pounds; in six herds it was between 100 and 150 pounds and in two herds below 100 pounds. The value of the butter fat from the poorest cows varies from \$19.58 to \$55.28.

TABLE THREE.

Comparing the Average Production of all the Cows in Each Herd.

|         | No of<br>Cows |         | Per Cent | Lb. B. | Value<br>Milk \$1.15 | Value<br>B. Fat. |
|---------|---------------|---------|----------|--------|----------------------|------------------|
| 1       | 11            | 5753.00 | 4.54     | 261.61 | \$66.16              | \$65.40          |
| 1       | 11            | 5753.00 | 4.54     | 261.61 | 066.16               | \$65.40          |
| 2       | 8             | 7376.4  | 3.19     | 267.75 | 84.82                | 66.93            |
| 3       | 5             | 8056.78 | 3.42     | 275.78 | 92.65                | 68.94            |
| 4       | 11            | 6219.77 | 3.89     | 242.32 | 71.52                | 60.58            |
| 6       | 20            | 7873.19 | 3.62     | 285.21 | 90.54                | 71.30            |
| 7       | 10            | 4524.75 | 3.76     | 170.49 | 52.03                | 42.62            |
| 8       | 10            | 4485.70 | 4.29     | 192.51 | 51.58                | 48.12            |
| 10      | 16            | 4761.62 | 4.14     | 199.73 | 54.75                | 49.93            |
| 11      | 9             | 5969.44 | 3.43     | 205.02 | 68.64                | 51.25            |
| 12      | 13            | 4503.65 | 3.89     | 175.41 | 51.79                | 43.85            |
| 15      | 12            | 5127.8  | 4.03     | 206.78 | 58.96                | 51.69            |
| 16      | 9             | 4607.5  | 3.98     | 183.52 | 52.98                | 45.88            |
| 17      | 7             | 4354.65 | 3.96     | 172.64 | 50.08                | 43.16            |
| 19      | 19            | 5409.66 | 4.11     | 242.94 | 62.21                | 60.75            |
| 20      | 16            | 5867.75 | 3.84     | 225.71 | 67.48                | 56.43            |
| 21      | 15            | 5970.92 | 4.07     | 242.87 | 68.67                | 60.71            |
| 23      | 25            | 3314.10 | 4.28     | 142.05 | 38.11                | 35.51            |
| 24      | 9             | 5921.41 | 5.91     | 350.17 | 68.09                | 87.54            |
| Average |               | 5561.00 | 4.01     | 224.57 | 63.94                | 56.14            |

Passing on to table 3, let us study for a moment the average production of the cows in the different herds. The average production of herd three is seen to have been 88,056.78 pounds of milk and 275.78 pounds of butter fat from five cows. By noting the highest and lowest production in this herd as shown in tables 1 and 2, it is obvious that they are uniformly high producers. The same thing is true in herd six, where the number of cows is greater and the butter fat production larger. Herd 23 has the lowest average production, which is 3,314.10 pounds of milk and 142.05 pounds butter fat per cow. In the different herds, the average return per cow on the butter fat basis varies from \$35.51 to \$87.54. When we reflect that the average cost of feeding a cow for a year varies under different conditions from \$35 to \$45, the profit per cow in some instances becomes a negative quantity. There is a vast difference between a return of

\$35.51 or \$87.54 per cow, the causes for which will be discussed later.

**TABLE FOUR.**  
Highest Average Herd, No. 24

|                                     | Per cent |      | Av. Milk<br>per day. | Av. Fat<br>per day. | Milk               | B. Fat         |          |
|-------------------------------------|----------|------|----------------------|---------------------|--------------------|----------------|----------|
|                                     | Milk.    | Fat  |                      |                     | \$1.15<br>per 100. | 25c<br>per lb. |          |
| Best, No. 1 . . . . .               | 6911.4   | 6.91 | 477.3                | 21.86               | 1.50               | \$79.48        | \$119.32 |
| Poorest, No. 9 . . . . .            | 3477.6   | 4.64 | 161.46               | 29.22               | 1.35               | 39.99          | 40.36    |
| Average . . . . .                   | 5921.41  | 5.91 | 350.17               | 21.10               | 1.25               | 68.09          | 87.54    |
| <b>Lowest Average Herd, No. 23.</b> |          |      |                      |                     |                    |                |          |
| Best, No. 24 . . . . .              | 4337.2   | 4.96 | 215.55               | 18.53               | .92                | 49.87          | 53.88    |
| Poorest, No. 26 . . . . .           | 1845.8   | 4.24 | 78.34                | 5.46                | .24                | 21.22          | 19.58    |
| Average . . . . .                   | 3314.1   | 4.28 | 142.05               | 13.43               | .57                | 38.11          | 35.51    |
| <b>Medium Average Herd, No. 20.</b> |          |      |                      |                     |                    |                |          |
| Best, No 7 . . . . .                | 7529.5   | 3.93 | 296.09               | 21.88               | .861               | 86.59          | 74.02    |
| Poorest, No. 11 . . . . .           | 2980.0   | 4.56 | 136.02               | 13.30               | .607               | 34.27          | 34.00    |
| Average . . . . .                   | 5367.75  | 3.84 | 225.71               | 20.52               | .789               | 67.48          | 56.43    |

In order to show the difference in productive capacity of the cows tested and the variation within the herds, table 4 has been prepared. Three herds have been selected; one showing the highest average production; another the lowest average production, and a third showing medium production. In herd 24 the best cow produced 477.3 pounds butter fat; the poorest 161.46 pounds, the average for the herd being 350.17 pounds per year. The poorest cow paid \$40.36 for butter fat, the best \$119.32, the average for the herd being \$87.54. You will observe also that the best cow in the poorest herd (23) produced 215.55 pounds of butter fat, while the poorest cow yielded only 78.34 pounds, the return for the same being \$53.88 and \$19.58 respectively. The average production of this herd is 142.05 pounds of butter fat equal to \$35.51 per cow. Under ordinary conditions of food and care this would leave little or no profit, but in this particular instance the herd was run on cheap pasture and given inexpensive farm grown food. In winter the most of the herd was dry and at no time did they receive much concentrated food. The owner contended that in keeping them this way their production was clear gain, as he had plenty of cheap land for



pasture. The cows were an inferior lot and it is doubtful if they would have responded sufficiently to warrant the feeding of an expensive ration, yet it is probably true that much better returns would have been obtained had they been nourished sufficiently to prolong their lactation to a reasonable length. Many of the cows were unprofitable, some gave a good return. The large return in herd 24 is the result of good breeding and care, both of which were absent in herd 23. Herd 20 illustrates an average herd and is inserted for comparison with 23 and 24.

TABLE FIVE.

## Herd No. 7, F. E.

Table Showing Profit Per Cow When the Average Cost for Food Is \$35.00 Per Year.

| No of Cow.                             | Lb. Milk | Per Cent Fat. | Total Fat. | Value B. F. 25c lb. | Cost Food. | Profit. |
|--|----------|---------------|------------|---------------------|------------|---------|
| 1                                      | 5082.4   | 3.61          | 183.70     | \$45.90             | \$35.00    | \$10.90 |
| 2                                      | 3412.1   | 3.78          | 128.96     | 32.24               | 35.00      | 2.76    |
| 3                                      | 4114.5   | 3.72          | 148.61     | 37.15               | 35.00      | 2.15    |
| 4                                      | 4417.0   | 4.29          | 189.86     | 47.45               | 35.00      | 12.45   |
| 5                                      | 4131.8   | 3.76          | 155.51     | 38.88               | 35.00      | 3.88    |
| 6                                      | 4397.2   | 3.77          | 165.97     | 41.49               | 35.00      | 6.49    |
| 7                                      | 4190.8   | 3.25          | 136.58     | 34.14               | 35.00      | .86     |
| 8                                      | 5506.8   | 4.77          | 264.01     | 71.00               | 35.00      | 36.00   |
| 9                                      | 4842.7   | 2.89          | 140.21     | 35.05               | 35.00      | .05     |
| 10                                     | 5152.2   | 3.71          | 191.58     | 47.90               | 35.00      | 12.90   |
| Total                                  |          |               |            | \$431.20            | \$350.00   | \$81.20 |
| Average profit per cow                 |          |               |            |                     |            | \$8.12  |
| Omitting No. 8, average profit per cow |          |               |            |                     |            | 5.02    |
| <b>Less Cows—More Money.</b>           |          |               |            |                     |            |         |
| 1                                      | 5081.4   | 3.61          | 183.70     | 45.90               | \$35.00    | \$10.90 |
| 4                                      | 4417.0   | 4.29          | 189.83     | 47.45               | 35.00      | 12.45   |
| 6                                      | 4397.2   | 3.77          | 165.97     | 41.49               | 35.00      | 6.49    |
| 8                                      | 5506.8   | 4.77          | 264.01     | 71.00               | 35.00      | 36.00   |
| 10                                     | 5152.2   | 3.71          | 191.58     | 47.00               | 35.00      | 12.90   |
| Total                                  |          |               |            | \$253.74            | \$175.00   | \$78.74 |
| Average profit per cow                 |          |               |            |                     |            | \$15.74 |
| Gain                                   |          |               |            |                     |            | 7.62    |

I wish to call your attention now to table 5, which gives the production of each cow in herd seven and the net profit per cow, when the average cost for food is \$35 per year. I have taken

\$35.00 as the average cost per cow, because it corresponds very closely to the actual value of the food consumed as determined from the data collected at the time of testing the herd. In the last column you will see that two cows were kept at an actual loss; three just about paid their board bill, and five gave a small profit. The total cost of feeding these ten cows for a year was \$350, their butter fat was worth \$431.20, leaving a profit of \$81.20 on the herd for a year's work, or \$8.12 per cow. You will also note that cow No. 8 gave a profit of \$38.00, the largest amount of any in the herd. Leaving No. 8 out of the herd the return would have been only \$5.02 per cow. If they had all been as good as No. 8, the owner would have realized a profit of \$380. instead of \$81.20. The second part of the table shows that with the five best cows, at the same cost for maintenance, the total profit would have been nearly as large as with the whole herd. That is if the right cows are removed a smaller herd may be most profitable. With the five cows there is a cost for food of \$175, against \$350 for the whole herd, and a net profit per cow of \$15.74 against \$8.12. By reducing the herd the cost of food is reduced one-half and the return per cow increased \$7.62. Do we need a better illustration of the benefits to be derived from testing? Is any man so dull that he cannot grasp the importance of these facts? The owner of this herd could not see his errors until they were pointed out to him in this conclusive manner.

TABLE SIX.

## HERD 3.

Table, Comparing the Production of Seven Cows Which Were Sold, with the Production of Those Substituted for Them.

| No. of Cow.   | Date of Freshening. | Test week ending. | Lb. Milk | Per ct. Fat. | Lb. B. Fat | Year's Record. |         |
|---------------|---------------------|-------------------|----------|--------------|------------|----------------|---------|
|               |                     |                   |          |              |            | Milk.          | B. Fat. |
| 2.....        | Aug. 16             | Dec. 26           | 81.8     | 5.0          | 4.09       |                |         |
| 3.....        | Oct. 8              | Dec. 26           | 95.6     | 4.2          | 4.01       |                |         |
| 4.....        | Oct. 16             | Dec. 26           | 156.1    | 4.3          | 6.71       |                |         |
| 5.....        | July 20             | Dec. 26           | 90.9     | 4.6          | 4.18       |                |         |
| 6.....        | June 15             | Dec. 26           | 132.0    | 4.0          | 5.28       |                |         |
| 7.....        | July 25             | Dec. 26           | 119.6    | 4.2          | 5.02       |                |         |
| 8.....        | Oct. 5              | Dec. 26           | 116.7    | 4.2          | 4.90       |                |         |
| Average ..... |                     |                   | 113.24   | 4.3          | 4.88       |                |         |

|               |         |         |        |     |       |         |        |
|---------------|---------|---------|--------|-----|-------|---------|--------|
| 10.....       | Jan. 31 | Feb. 27 | 202.9  | 4.2 | 8.52  | 7547.8  | 308.07 |
| 11.....       | Feb. 25 | Apr. 29 | 158.7  | 3.2 | 5.08  | 6719.1  | 221.13 |
| 12.....       | Jun. 25 | Sep. 2  | 196.6  | 3.4 | 6.69  | 7590.2  | 261.50 |
| 13.....       | Sep. 15 | Nov. 4  | 220.5  | 3.0 | 6.62  | 8972.5  | 263.52 |
| 14.....       | Jan. 10 | Mar. 10 | 256.9  | 3.4 | 8.73  | 9454.3  | 324.08 |
| 15.....       | Dec. 26 | Jan. 6  | 210.9  | 4.7 | 9.91  |         |        |
| 16.....       | Jun. 18 | Jly. 14 | 189.0  | 4.0 | 7.56  |         |        |
| 17.....       | Jun. 6  | Jly. 14 | 227.8  | 4.6 | 12.68 |         |        |
| 18.....       | Sep. 17 | Nov. 17 | 263.3  | 2.8 | 7.37  |         |        |
| 19.....       | Nov. 4  | Nov. 17 | 264.8  | 3.4 | 9.00  |         |        |
| Average ..... |         |         | 224.14 | 3.6 | 8.21  | 8056.78 | 275.78 |

With this same thought in mind, consider table 6, which gives the weekly production of seven cows sold from herd 3, and the production of those substituted for them. After the owner of this herd had made two tests he sold seven of his poorest cows for \$160 and purchased a pure-bred cow for \$150. When asked why he made such a radical change he said: "I didn't know my cows were so poor; I cannot produce milk with them as cheaply as I should." Pointing to the milk scales which had been furnished him and which he had been using, thoughtfully he said: "I would not take \$100.00 for them; they have been worth that to me." Referring to the table you will see that although some of the cows had been in milk a considerable time, the average production per week was low. These cows were disposed of so soon that no yearly record could be obtained. Of those cows which were added to the herd later the average weekly production for their first test is nearly twice as much as that of the original seven. Although the stage of lactation and the season of the year are not entirely comparable in the two groups, the superior excellence of the latter is apparent. Of the five new cows that have completed a year, the best yielded 9,454.5 pounds of milk, containing 324.08 pounds of butter fat. The owner is now thoroughly alive to the importance of testing and is not only buying new cows and testing them, but is using a pure-bred dairy bull in his herd.

Let us make an application of what has already been presented. There are two more tables, but I will not bore you with their

contents, except to aid in the discussion. The best ten cows tested produced 388.75 pounds, the poorest ten 109.42 pounds, the average of all tested being 224.57 pounds of butter fat. The average production of the poorest herd is 142.05 pounds of butter fat, which is approximately the same as the average production of a dairy cow in Illinois. Table 7 shows that the difference

TABLE SEVEN.

## Average Production—Poorest and Best Herds.

| Herd.           | No. of Cows | Lb. Milk.      | Per cent Fat. | Lb. B. Fat.   | Value Milk Value |                  |
|-----------------|-------------|----------------|---------------|---------------|------------------|------------------|
|                 |             |                |               |               | \$1.15 per 100.  | F.F. 25c per lb. |
| Best, No. 24    | 9           | 5921.41        | 5.91          | 350.17        | 68.09            | 87.54            |
| Poorest, No. 23 | 25          | 3314.10        | 4.28          | 142.05        | 38.11            | 35.51            |
|                 |             | <u>2607.31</u> |               | <u>208.12</u> | <u>29.98</u>     | <u>52.03</u>     |

## Difference in B. F. 146.5 Per Cent.

## Average Production—Poorest and Average.

|                 |    |                |      |               |              |              |
|-----------------|----|----------------|------|---------------|--------------|--------------|
| Average, No. 1  | 11 | 5753.05        | 4.54 | 261.61        | 66.16        | 65.40        |
| Poorest, No. 23 | 25 | 3314.10        | 4.28 | 142.05        | 38.11        | 35.51        |
|                 |    | <u>2438.95</u> |      | <u>119.56</u> | <u>28.05</u> | <u>29.89</u> |

Difference in B. F. ....84.1 per cent  
 Best 10 cows tested.....388.75 lbs. B. fat.  
 Poorest 10 cows tested .....109.42 lbs. B. fat. ?  
 Average all cows tested .....224.57 lbs. B. fat.  
 Average all cows tested .....224.57  
 Average poorest herd .....142.05

82.52  
 Best 10 cows tested .....388.75  
 Average poorest herd .....142.05

246.70  
 Cows in Illinois .....995,429  
 25 per cent improved .....248,857

746,572  
 746,572 x 82.52 lbs. ....61,607,121.44 lbs.  
 61,607,121.44 lb @ 25c .....\$15,401,780.36  
 746,572 x 246.7 lbs. ....184,179,312.4 lbs.  
 184,179,312 lbs. @ 25c.....\$46,044,828

between the average production of all cows tested and the average of the poorest herd is 82.52 pounds. What would be the effect

upon the dairy interests of Illinois if the average production per cow should be increased 82.52 pounds of butter fat? According to a recent report there are 995,429 dairy cows in the state of Illinois. It is doubtful if one-fourth of this number (248,857) are improved individuals of a very high order, but for lack of definite knowledge on this point, we will assume that there are. There remains then 746,572 cows of low average production, in which an increase of 82.52 pounds of butter fat can be readily brought about by selection and breeding. Such an improvement would cause an increase in the annual production of butter fat of 61,607,121.44 pounds. This amount at twenty-five cents per pound would increase the return from the dairy cattle of Illinois \$15,401,780.36. This seems like a large sum at first thought, but it is only a matter of increasing the return per cow \$20.63 and when the average production is as low as we now have, such an improvement can be readily secured.

To go a step farther, let us consider the possibility of raising the average production from that of the poorest herd to that of an average of the ten best cows tested. This would call for an increase of 246.7 pounds of butter fat per cow, which, even though it would take some time to accomplish it, is not at all beyond the range of possibility. Such an improvement would amount to 184,179,312.4 pounds of butter fat per year, which at twenty-five cents per pound would yield the dairy farmers of Illinois \$46,044,828 per year in addition to what they are now receiving. The first case calls for an increase up to the average production of the herds tested, while the latter refers to what is essentially maximum production. The former we must have, the latter will come in due time.

In order to prove what I have said concerning the possibility of raising the amount of butter fat per cow 82.52 pounds, I will call your attention to table 8. Under the heading, "No Grading" are grouped the herds in which there has been no attempt to strengthen the breeding of the herd along dairy lines by either the purchase of dairy-bred cows or the use of a pure-bred sire.



TABLE EIGHT.  
DOES BREEDING PAY ?

Average Annual Production Per Cow.

| No Grading.             |              |                | Grading.      |              |                |
|-------------------------|--------------|----------------|---------------|--------------|----------------|
| Initial.                | No. of Herd. | Lb. of B. Fat. | Initial.      | No. of Herd. | Lb. of B. Fat. |
| F. E. ....              | 7            | 170.49         | F. M. R. .... | 2            | 267.75         |
| W. W. ....              | 8            | 192.51         | L. P. ....    | 3            | 275.78         |
| J. F. ....              | 10           | 199.73         | G. W. ....    | 6            | 285.21         |
| J. H. P. ....           | 12           | 175.41         | F. G. A. .... | 11           | 205.05         |
| J. C. C. ....           | 16           | 183.52         | W. J. H. .... | 19           | 242.94         |
| J. P. ....              | 17           | 172.64         | J. H. ....    | 20           | 225.71         |
| H. A. P. ....           | 23           | 142.05         | H. H. ....    | 21           | 242.87         |
|                         |              |                | C. V. S. .... | 24           | 350.17         |
| Average .....           |              | 176.62         |               |              | 261.93         |
| 261.93—176.62 .....     |              |                | 85.31         |              |                |
| 85.31 lbs. @ 25c .....  |              |                | \$21.32       |              |                |
| 746,572 x \$21.32 ..... |              |                | \$15,916,915  |              |                |

Under the heading "grading" are grouped the herds in which some effort has been made to incorporate better dairy blood. In each case the average butter fat per cow is given for the herd indicated. The average production per cow in those herds where no concerted action has been taken looking toward improvement is 176.62 pounds of butter fat, while in those herds where an attempt at improvement has been made, the average production is 261.93 pounds. This gives a difference of 85.31 pounds of butter fat in favor of the practice of grading up, which amount at twenty-five cents per pound equals \$21.32. Reasoning from these results it appears that the productive capacity of the dairy herds of this state may be increased \$16,000,000 per year through the use of pure-bred sires and selection by the Babcock test. I doubt if we need better proof of the dire necessity of testing and the use of pure sires in the dairy herds of this commonwealth. The two are inseparable; they go hand in hand, the test pointing out the cows through which the improvement should be sought; the use of pure-bred sires intensifying and adding to the dairy capacity of the offspring.

Dairymen of Illinois, I appeal to your better judgment.

Dairymen of Southern Illinois, of Effingham and adjoining counties, wherever you may be and whatever your perplexities, you must study your individual cows. You cannot hope for success without knowing their capacity. I feel that I know something about your conditions, for I have been upon your farms and in your homes. I have studied your soil and your crops and the way they are handled, as well as your farm buildings and their arrangement. I have seen you feed and milk unprofitable cows and pile your precious manure near the running brook, where its valuable constituents steal away ere you are aware. For these reasons I have spoken to you plainly with the hope of arousing greater interest in this vital problem. Bare figures are dry in themselves, yet they often throw a flood of light upon a burning question. I am interested in every dairy herd, for its problems are numerous and their correct solution of profound significance. Are you interested in your own herd? Do you care to increase your return \$20.00 per cow? Will you do your part to increase the production of dairy products in Illinois \$16,000,000 per year? It can be done in four years if every man will put his shoulder to the wheel and lift. Don't be afraid of over production, for the world is full of people willing to pay a fair price for clean milk, butter and cheese. Learn to produce cheaply with profitable cows and your success is assured. Use a pure-bred sire, dispose of the poor cows, and the good ones will pay for the farm, send the children to college and provide you a comfortable home. However far you may stray from the path of approved agricultural practice, you may come back to the dairy cow with full assurance that a reasonable amount of effort will receive its measure of success.

#### DISCUSSION.

Mr. Lindley:—

Q:—How does that compare with northern Illinois?

A:—They don't test quite as high, that's all.

Q:—How long have you been at this work?

A:—Two years and one month. This shows the first year's work.

Q:—In your work the past year have you satisfied yourself that your work has been of benefit to this county; seen any results?

A:—Why, yes; there is evidence in more ways than one.

Q:—The reason I ask this question. The association has gone on record before the legislature asking for funds to continue this work and enlarge on it, and it is the first opportunity I have had in this section of knowing whether the work has been successful. The association thinks it is a good thing and should have more of it.

A:—There is an immense opportunity for doing work of this kind, but the expense involved restrict from getting at the men. We have studied the conditions and tried to assist the men not only in the handling of their cattle, but their crops, anything, even in the construction of their barns, etc., which not only leads to economy in production, but leads to higher quality.

Mr. Newman:—It is very encouraging to me to have this recorded.

Q:—A Member:—That herd of eleven cows and herd of 24 cows; any difference in the age of those cattle?

A:—No particular difference in age of cows.

(Comparing charts.)

Mr. Jansen:—Q:—I see 23 is the lowest and 24 the highest; 23 has pure-bred sire now and intends to do better than that. A year ago this spring he put a pure-bred sire of good dairy quality at the head of his herd and intends to do better.

Q:—What cows represent 5.9, 24?

A:—High grade Jersey cows, not only well bred, but good individuals, average 417 pounds butter fat.

By the President:—We will have to pass on to next one on program.

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**BREEDING AND CARE OF THE DAIRY COW.**

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By **N. P. Hull, Diamondale, Mich.**

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Ladies and Gentlemen :

I have to leave on this 4:12 train. I am advertised to speak in Michigan tomorrow morning. This gets me to where I have got to quit on time.

I have a few suggestions I would like to give you. A certain farmer went to Chicago and while there saw a boy working a slot machine. The boy dropped five cents in and kept taking three cents out in return. The gentleman went back to Michigan where he told that the boy kept dropping five cents in and only got three cents back each time in return. That same man was feeding five cents worth of feed and got three cents worth of milk and never knew he was doing the same thing as the boy. The trouble with the man and the boy, they were both mistaken, badly mistaken.

I am thinking there are too many men in Michigan and Illinois who call themselves dairymen, who are only cow keepers. They are also mistaken. Mr. Mason has given a part of my talk. If you run a machine, run it to its maximum capacity. It costs from 18 to 20 dollars just to keep the cows; in summer \$15.00 just to run that machinery. When I commenced the dairy business it cost me \$20.00 to convert \$100.00 worth of feed into milk. I wasn't running that machinery up to its maximum capacity. To do that a man must feed in a certain way and feed certain stuff and take proper care of his cows.

Cows get in the habit of expecting their feed the same time every day. They will give more milk that way. When getting 155 cans of milk a day, if I feed regularly, I notice the difference in the pail. Feed regularly and feed a variety of feeds, because a cow will do better. She is like a human being for that. Take it home to yourselves. Won't you do better with a variety of feed, and won't a cow do better? I have seen my cows in the covered yard near the manger waiting for an invitation to come

in because the silage was in there and they could smell it. It makes their mouths water. If you go out to your table and it is set nicely and you are real hungry your mouth will water, too. What will that indicate? You can eat, digest and assimilate your food and do good work on it, unless you have the dyspepsia. I believe, my friends, there is nothing as important in the line of feeding as this matter of palatability, to have the things taste right to the cow. To have all this you must run the machinery near the maximum. She must get that stuff from her food. Nothing will help so much as to have a palatable ration. Clover hay. Take in some clover hay, and the farmer can tell then if it is good or not. Cut it just at right stage. Don't you suppose the cow generations back knew the smell of it, and she knows it now.

I was fourteen years old when father died and I had to run up against the business. I asked a man when to cut hay, and he told me one time and another told me some other time, and I had to learn.

Silage is a good succulent food. The cow likes it. I cannot go into this talk on feeding, as I haven't the time and should miss my train. But let me say one or two things more. No matter whether you keep one cow or fifty, let me ask why you do it unless to bring you in a good profit, and to do that you have got to take care of them. She must have good care. Your cows must be comfortable. You must keep them warm, and you must feed them up to the limit. There is no use in being a cow keeper, you must profit from them. It takes as I said \$18 or \$20 to keep the cow, and after you have paid that for the machinery you must make the machinery run to its maximum capacity, and then you will find there is nothing in Illinois, or Michigan, or any other state that will pay as good and even a profit as the dairy cow. Then you can take the excrements from that cow and put it on the land to help pay a larger per cent of profit.

It is a good thing to have a business that pays a good profit every year, and goes on paying it; that not only pays a good profit every year, but also a good income. I have seen the time



when the other animals on a farm have kept one guessing pretty closely whether he got any profit at all, but the old dairy cow when well cared for and fed right does not go back on us. There is no speculation about her.

#### DISCUSSION.

Q:—How much grain do you feed?

A:—About six pounds of concentrates besides corn and silage.

Mr. Mason:—We can't feed silage.

Q:—How much silage?

A:—Thirty-five to forty pounds.

Q:—Mr. Lindley:—We only feed twenty pounds down here, after milking in the morning.

A:—Yes, sir; is that so?



## DAIRYING A PROFITABLE BUSINESS.

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At a recent auxiliary convention held in Alma of the Michigan Dairymen's Association, N. P. Hull, a practical and successful dairyman, discussed dairying most interestingly and profitably. He said:

It is a fact that the majority of the cows in the state of Michigan are not paying their owner for the feed they consume and his time in growing that feed for them, but it is also a fact that this ought not to be so and there is no reason why it is so except the carelessness of the man handling and feeding the cow. No reason in the world. Now my friend, whether you keep one cow or many, let me ask you what in the world you keep that cow for, unless she gives you something above the actual cost of feeding and caring for her? What excuse have you? I have inquired at different times why should a man keep a cow, a pig or a hen unless he can make that animal pay a little more than the cost of caring for it? I don't want to set aside a part of my life putting it into any business and find after I have finished that part that I have nothing to show for it. I don't believe that you do, so what little time I have today I want to take to apply as much to the man who keeps one cow as to the man who keeps many.

I want to speak briefly in regard to the advantages of the dairy business, taken as a part of the legitimate farm operations. No doubt some of the farmers here have been troubled with the labor problem. It was a trouble to us upon our farm at one time and a great many still say that is the great objection to dairying, because they cannot get the help. I believe you will find that the dairy business will help you with the labor proposition; if you hire a good man you want to keep him. The man feeding our cows today has been with us five years. Why were we able to keep that man five years? He has a family, lives in a tene-

ment house on my farm. Now, had I not been able to furnish that man with employment whereby I could pay him good wages and furnished him employment the year round, I could not have kept him. Should I just furnish him with work for seven or eight months in the summer and fall, I never could have kept that man in that way; neither could I have afforded to keep that man had I grown hay or some line of stock that I could just as well have cared for and this man had to go away for the winter season. I must have some business on that farm to furnish him employment the year round and must have a business that will bring me returns so I can pay him good wages. Now, we have our cows freshen in the fall—we make a business of dairying in the winter. The cows give more milk when fresh at that time and we can profitably employ that help through the season and pay them their wages, because the cows enables us to pay good wages. When it comes the busy season in summer, in harvest time, we want our cows dry for six weeks to two months. By handling the dairy in that way it helps a man out in the labor question.

Considering the matter of a dairy as a part of the farm operation—you will agree with me that it is necessary on our farms in Michigan to carry on some line of live stock husbandry. I will agree with you that we have some of the finest farms in the state of Michigan, but you will agree with me that the man who keeps a large line of animals upon his farm, feeds out the stuff and gets returns to the land in the form of excrements, is the man who will produce better crops than the man who does not do that and in the days that are to come he will go on producing good crops, while his brother who does not practice that is bound to fail. So you will agree that we must carry on some kind of live stock husbandry. There is good profit in it, because we upon the farm must consider not only how many dollars' worth of stuff we can sell this year, but we want to go on producing as many dollars' worth as we can in the years to come and we want to leave that farm so our children and children's children afterwards may go on producing, because you and I when we have spent our best

years of our lives to make these farms a home, want our children to think of that farm this way, and if they are to do that it must be left so that they can produce profitably.

With the dairy business we feed the stuff upon the farm and the flow, if she is a good cow, pays us a splendid profit; then we take the resultant excrement from that cow and apply it to the land to still go on paying a larger per cent of profit.

I believe the American farmer is a little too much inclined to speculate; I believe the American people are, and possibly most any other people, and it is all right, but I think you will agree with me that it is the part of wisdom to have some line of business that we can depend upon, not only this year and not only today but for all the years to come and every day of the year. Now I ask you my friends do you know of any business (let me say right here, if anyone does not understand me, if he will ask I will stop anywhere. I am used to interruptions and don't mind, and I don't want to make any statement here that is not positively true), let me say what I am going to say about this dairy business, and the conclusions I have reached have been because I have asked the old cow and she has given me these answers.

I was saying that it is a good thing to have a business that pays a good profit every year, and goes on paying it; that not only pays a good profit every year, but returns a quick, steady income. I am going to tell you why I believe the dairy business will do that better than any other line of live stock husbandry. Start today with a drove of swine; you cannot get those swine upon the market in less than six months: It is a matter of speculation; you are giving feed to them that is worth dollars and you know not, when that product is ready to go on the market, whether it will pay for that feed and the initial cost or not! On the other hand, when I go before my cows and give them a feed I simply step right around and draw my pay, and there is no speculation in it. You get your pay the same day; I can feed my cows generously, draw my pay and I know what business I am doing—that is, if I know the value of the stuff I am feeding them and the value of the stuff they return, and if a man does not know that he

is not carrying on the dairy business in a business way. Not only is that true with hogs, it is just as true with any farm crop outside of live stock husbandry. I have never seen the time upon my farm for a single year when a good cow, properly cleaned and fed, would not pay a handsome profit. I have seen the time upon my farm when my pork and sheep paid me a handsome profit, and have seen other times when I had to figure mighty close whether there was any profit at all. I have seen the time when we sold pork at a good profit and sometimes at a loss, and I have seen the time when we sold steers at a profit and other times when they did not pay me for the feed they consumed; but I never saw the time when the good cow, well fed and well cared for, would not pay me a profit—and it eliminates the matter of speculation.

Another thing, it is a steady income. You people who are selling to these plants here get your pay every two weeks. I get my pay every month and the man who is making butter usually gets his pay a little oftener than that. It is a convenience that enables us to meet our bills when they come due, enables us to do a cash business. It is not true, my friends, that no other lines of business carried on on a farm allows us to do a cash business when we buy as does the dairy business? Is there any other line that you know of that brings in the money as steadily as does the returns from the dairy business, and is it not a good thing to have those things steady, keep our bills up and do a cash business? So it is a sure, steady income.

Now about carrying this on in a business way. I have been in this community since last Monday, have visited many farms around here, many dairymen. We have a form to fill out when we visit a dairyman, and among the questions we ask is, "What are your gross returns per cow?" Further down we ask him the cost of keeping a cow for a year. My friends, how many men do you suppose there are in the vicinity of Alma whom we visited that could tell us how much they got per cow per year, and how much it cost them to keep her? If a man were carrying on any other business on the face of the earth and did not know anything about what his stuff cost him or what he got from it, how long



do you suppose he could keep in business? I know of no business, aside from farming, where a man can continue in business if he does business in that way. I found two or three men around Alma that knew how much they got from a cow in a year, but I did not find a man around here who knew what it cost him to do that—and you are not so lonesome as you might be, either, for there are lots of others. In fact I should almost feel ashamed to tell you how many men in Michigan I have met who do not know how much it cost to keep a cow. I do not believe that is good business; do you?

Just briefly, to carry on the dairy business in a business way is to carry it on in a profitable way, and there are three things necessary to know in order to do that. First, have a good cow. Two cows may stand side by side and unless you weight the milk and test the milk how do you know which is the better cow? Frequently one cows gives 225 pounds and the other 250 pounds. Can you tell which cow gives 250 pounds unless you weigh the milk? You cannot do it. What is the reason you keep her? Don't you think it would be policy to know which is the better cow and get rid of the poor one? Get good cows.

The next proposition is to feed them right. This is a subject that is a hobby of mine. I dare not start in on it at all because I would forget myself and these other speakers would not have any chance at all; but she must be fed right. If a man started to build this building, what would he do? The first thing he would do would be to buy the material for such a building as this and buy it in proportion to make such a building. Is it not good reason that if you want a cow to furnish certain elements, that you furnish her with just the stuff to make those elements, call it balanced ration or whatever you will?

The next proposition is caring for the cow. She must have good care. A cow must be kept comfortable. That means that she must be kept warm. You will excuse me for referring to my own business, but just to illustrate it comes in nicely, for I know more about my own business than any other man's anyway. I was buying cows and a man who was sell-

ing his product at the same place I did mine, offered me a cow. I looked at her and she looked like a good cow, so I bought her. After I had bought the cow I asked, "What is the matter with the cow that you wanted to sell her?" There is no use in asking before you buy, but if you ask afterwards you may find out. I asked this man and he said: "Well, she does not give milk enough." He had five other cows and he said this was the poorest one. I took her home and put her in my barn. The temperature in my barn never gets down to freezing; I have a covered barn yard and the cows never get out from the time they go in in the fall until they get out in the spring. She freshened Oct. 8 and one year from that day I had 14,000 pounds of milk, \$40 from that one cow. That was the best cow that man owned. What was the reason he did not know it? He turned her out in the morning and, instead of covering her ribs with fat to keep out the cold, she stood there and shivered and when she was put under the right conditions she was one of the best cows ever in the state of Michigan and yielded a profit like that.

Just these three things let me say again. What will make forty cows give milk will make one cow give milk. This applies to the one cow dairyman as much as to the forty cow dairyman. When you want a cow, get a good cow and feed her all she can eat. There is no use in keepiug just a cow. It takes \$18 or \$20 to keep her just a cow and after you pay \$20 to run that machinery you must make that machinery run to its maximum capacity, and let me say to you today there is no line of live stock husbandry in the state of Michigan that one day and another will pay as good and even a profit as will a dairy cow.

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## THE BY-PRODUCTS OF MILK.

Paper read by D. O. Henry Nowak, of Chicago, before the Milk Producers' Institute, January 23rd, 1906, on "The By-Products of Milk:

Ladies and Gentlemen:

Having been requested by the Secretary of this honorable

institution to address you at this occasion, I would like to say a few words concerning the bi-products of milk.

I must, however, ask you to pardon my pronunciation in the reading of my paper, since this is not only my first lecture in this country, but at the same time my first attempt to make use of the English language—in a public address.

Although I am not sufficiently acquainted with the methods of farming in this great country, which during the last few years has very greatly advanced, yet since I am a manufacturing chemist of over thirty-five years' practical experience,, chiefly in the utilization of the bi-products of milk, believe I have some knowledge about converting all farming products and in particular those obtained from milk into food products, as well as different chemical preparations for the use of the industries in general.

When I came to this wonderful country the first time, something over twelve years ago, that is, at the time of the World's Fair, I was exceedingly surprised to find that the milk which I already then considered "the kernel of all farming economy," was absolutely restricted in its utilization, since the cream separated and made into butter, and there was only demand for a small part of the buttermilk—so that all of the remaining buttermilk and the entire skim milk as far as it has not been used for the making of cheese for the feeding of cattle and hogs, had no further or more profitable utilization.

This fact chiefly occurred to me as being very surprising, inasmuch as some of the bi-products of skim or waste milk had already been used for a long time abroad for various purposes.

You will no doubt be somewhat astonished if I venture to state that almost your entire wearing apparel, from the hat down, either has been, or might have been more or less treated by means of some bi-products obtained from milk, as I shall explain a little more in detail in connection with every one of the various constituents of the milk. Furthermore, that the majority of things you daily come in contact with, also either

contain bi-products of milk themselves, or could be, or are manufactured by the use of chemical preparations made from milk.

And last but not least, the milk appears before you again and reminds you of its use, when you are building either a house or a barn, or whatever else it may be, and even then, when you are going out for the enjoyment of some sport or pleasure.

In order to explain what I have just said, let us at first consider the different constituents of the milk in the simple combinations known to us.

The whole by means of separating is divided into cream and skim milk; cream again divided into butter and buttermilk, and the skimmilk still further into curd and whey.

Leaving the butter aside, as its use is very well known to all of us, and does not command our interest any longer, except in connection with a new discovery by a good cook.

I take only the buttermilk and skimmilk up for further explanation—so as to convince you that the value of this bi-product of the dairy farming, represents nowadays a great item in our industry, as well as those of the whole civilized world.

Only in a few words I will say that the utilizations of the whole milk into condensed milk is lately advanced by different patented processes for the purpose of making milk powder. In mixing sufficient quantity of nitrate of sodium and phosphate of potassium to the milk, so as to assure the solubility of the albumen parts. The resulting powder after evaporation is soluble in water. To prevent decomposition, one or two per cent of the fresh milk itself, was butter.

In my opinion I do not believe that milk in powder form has a future, for the simple reason that the characteristic taste of non-crystalline sugar is added.

Speaking of buttermilk, you are undoubtedly acquainted with the fact that for a long time the only value received, out of the fresh milk is removed entirely.

The buttermilk so largely used in Europe had only a scant demand, and its use was limited to the neighborhood of the

dairy where it was produced, and was regarded by the few consumers as an excellent summer beverage.

But I wish to state right at this instant that the use of buttermilk for medical purposes either in concentrated or preserved state will be largely increased and will have an immense future.

The curative qualities of buttermilk have for many years been recognized in Europe, and therefore you find in all dairy countries, foremost in the Tyrolean Alps of Austria, and in Switzerland, Denmark, Sweden and Norway, sanitariums, where thousands of people troubled with kidney or liver complaint and other abdominal diseases, get not only relieved, but in most cases cured.

That the value of buttermilk is coming also to its well deserved recognition in this country, is demonstrated in an article emanating from Washington, about preserving and concentrating buttermilk, and where the more liberal use of buttermilk is recommended, especially for those suffering from the above mentioned ailments, and I can state to you that I have succeeded in preserving buttermilk to any length of time without injury to the consumer.

Now we come, in my opinion, to the most profitable part of the milk, the utilization of the milk into curds and other new products. In the year 1868, I entered in my father's business, who at that time was known as one of the first manufacturers of "Casein," or as it is called in England, "Lactarin" from milk, and had introduced the article as far back as 1848.

At the London Exposition in 1862, and later at Exposition in Vienna in 1873, and at the Centennial Exposition in Philadelphia in 1876, he was awarded diplomas for his "Casein" exhibits. The article was exported for a long time from our factory in Austria to the United States via England, and the knowledge of its utilization was very limited, thanks to the non-committal attitude of the English agents.

I therefore wish to emphasize that "Casein" or "Lactarin" or whatever fictitious name was given to dry curd, no matter



by what process or for what purpose it was used—it may have been for commercial utilization or food products—it made its first entry into the market more than fifty years ago.

All the processes are based upon the simple principle of making curd by means of natural acidity of the sour milk or by the use of rennet. Later on all kinds of vegetable, organic and even mineral acids were employed, which, however, in my opinion, are decidedly detrimental to the product in question. Especially where the curd is used for the manufacture of pure "Casein" and the remaining whey for sugar of milk, it is essential to know which method should be employed. The following extracts from chemical authorities will support my statement.

In the second German edition of "Muspratt's Practical Chemistry," 1870, is mentioned that "The 'Casein' or 'Lactarin' is due from milk by its own fermentation, and was at that time supposed to be started by the fermentation of lactic acid in milk."

An English translation of "Wagner's Chemical Technology," published in 1872, I found the following passage: "The application of a mixture of lime has been recently proposed as a mordant for this purpose 'Casein,' which is known in England as 'Lactarin,' and prepared from milk, (of which it is the curd), is dissolved in diluted caustic ammonia, and the solution thus obtained is mixed with freshly prepared milk of lime. The Casein lime mixture is used for steeping the cloth intended to be dyed. The Casein-lime becomes insoluble by the application of heat, after which the fabric is so thoroughly mordanted that it resists washing with alkaline fluids."

The following we find in "Thorpe's Dictionary of Chemistry," Vol. 1, published in 1890: "A preparation of 'Casein,' known as 'Lactarin,' is used as a substitute for albumen in dyeing calico printing. It was introduced by Pattison in 1848, for fixing pigment colors."

Other German books are mentioning the use of "Casein"

since 1870, for all kinds of paints, paper size, wall paper size, pastes and so forth.

Now let me tell only some uses of "Casein" or "Casein" preparation from skim milk. It is used as sizing for straw and felt hats, for the manufacture of paper and glazed paper, for glazing and finishing leather, for finishing and sizing silk, wool, linen and cotton thread, or piece goods, for the manufacture of wall paper, linoleum and various combination goods, and the finishing of the best grades of burlaps.

"Casein" produces furthermore, cements, putty, mucilage, glues and woodfillers. It is also used in printing ink, for the manufacture of all kinds of dry paints, water and fire-proofing, billiard balls, golf balls, buttons and various fancy articles to replace ivory, are made from "Casein." "Casein" has also been used in the so-called "Lost Arts." We are astonished by the freshness of the Mural paintings and decorations of European churches and palaces, and it is nothing else but "Casein" mixed with colors by the old masters, and is the means of perpetuating their canvasses and mural paintings. "Casein" either in the form of buttermilk or milk mixed with lime and sand played also an important part as mortar in the erection of monumental buildings thousands of years ago, and it is a well known fact that the mortar became harder with age than the material itself.

We have, for instance, in Marienburg, Germany, a monumental tower called the "Buttermilk" tower, built by the Romans, and it is a historical fact that this venerable old monument has withstood the onslaught by the ancient and modern war machines to which it was subjected to through the many invasions from the time of the Romans up to the Napoleonic era. I tried myself to dig out a piece of mortar, but the result was a broken knife blade and no souvenir. And I have only mentioned some of the uses of "Casein."

The latest utilization of the skim milk was accomplished last year in the manufacture of my own invention, "Dermiforma," an article for tanning purposes in all branches of the tau-

ning industry, and its use in connection with tanning of every kind of hides into leather.

This is my invention or discovery, which kept me busy for the past 15 years, originated from my conception, that the same vegetable or animal matter which produces the skin or hide on the animal should be the best matter for producing leather of unexcelled quality, and it requires the use of all the skim milk to the last drop.

The use of my discovery, "Dermiforma," will be better understood if I tell you that there are nearly three thousand (3,000) tanneries in the United States alone, and based upon experience up to the present time, the use of "Dermiforma" will be so great as to require several million pounds of milk per day for its manufacture.

Having now figuratively arrived at the foot of my previous statement, and also my address, I think it advisable not to detain you any longer. I trust that my condensed lecture has convinced my esteemed audience that the so-called skim or waste milk and its bi-products will be an epoch-making factor in the commercial and industrial world, and will be of equal importance to civilization at large, as milk has been for centuries to the entire human race.

In closing my address, allow me to quote your illustrious countryman, Ingersoll, who says in one of his addresses: "No farmer can afford to raise corn, oats and hay to sell; he should make every profit out of what he produces." And let me add, that he should raise cattle in order to get the best milk producing cows, and thus receive the highest returns for this exceedingly valuable fluid, which now can be utilized without any waste to the very last drop. I thank you.

## DAIRY LAWS OF ILLINOIS

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Laws of 1879, page 111. (Hurd's Revised Statutes) (Chapter 38, Sections 9-9e).

AN ACT to regulate the sale of milk, and to provide penalties for the adulteration thereof. (Approved May 29, 1879.)

Section 1. That whoever shall, for the purpose of sale for human food, adulterate milk with water or any foreign substance, whoever shall knowingly sell for human food, milk so tainted which cream has been taken, without the purchaser being informed or knowing the fact, or whoever shall knowingly sell for human food, milk from which what is commonly called "strippings" has been withheld, without the purchaser thereof being informed or knowing the fact, or whoever shall knowingly sell for human food milk drawn from a diseased cow knowing her to be so diseased as to render her milk unwholesome, or whoever shall knowingly sell for human food, milk so tainted or corrupted as to be unwholesome, or whoever shall knowingly supply, or bring to be manufactured into any substance for human food, to any cheese or butter factory or creamery, without all interested therein knowing or being informed of the fact, milk which is adulterated with water or any foreign substance, or milk from which cream has been taken, or milk from which what is commonly called "strippings" has been withheld, or milk drawn from a diseased cow, knowing her to be so diseased as to injure her milk, or milk so tainted or corrupted as to be unwholesome, or whoever shall knowingly, with intent to defraud, take from milk after it has been delivered to a cheese factory or creamery, to be manufactured into any substance for human food, for or on account of the person supplying the milk or cream, or shall, with like intent, knowingly add

any foreign substance to the milk or cream, whereby it, or the products thereof, shall become unwholesome for human food, shall be guilty of a misdemeanor, and for each and every such misdemeanor shall be fined not less than twenty-five nor more than one hundred dollars or confined in the county jail not exceeding six months or both, in the discretion of the court.

Section 2. Any person who shall adulterate milk, with the view of offering the same for sale or exchange, shall keep cows for the production of milk for market, or for sale or exchange, in an unhealthy condition, or knowingly feed the same on food that produces impure, diseased, or unwholesome milk, shall be deemed guilty of a misdemeanor, and, on conviction, shall be punished by a fine of not less than fifty dollars nor more than two hundred dollars, for each and every offense.

Section 3. Any person or persons who shall in any of the cities of this state, engage in or carry on a retail business in the sale, exchange of, or any retail traffic in milk, shall have each and every case in which the milk is carried or exposed for sale or exchange, and the carriage or vehicle from which the same is vended, conspicuously marked with his, her, or their name or names, also indicating by said mark the locality from which said milk is obtained or produced, and for every neglect for such markings, the person or persons so neglecting shall be subject to the penalties expressed in section 2 of this act; but for every violation of this act, by so marking said can, carriage, or vehicle, as to convey the idea that said milk is produced or procured from a different locality than it really is, the person or persons so offending shall be subject to a fine of one hundred dollars.

Section 4. Any person who shall, in any of the cities in this state, offer for sale any milk from which the cream or any part thereof shall have been taken, shall offer for sale and sell the same as skimmed milk, and not otherwise, and shall have each can or vessel in which such milk is carried or exposed for sale plainly and conspicuously marked with the words "Skimmed Milk." Any person violating this section shall be subject to a fine not exceeding fifty dollars for each and every violation.



Section 5. Upon the rendition of judgment imposing a fine as provided in the foregoing sections, it shall be the duty of the justice of the peace or other court rendering said judgment, also to render a judgment for the costs, and forthwith to issue a *capias* or warrant of commitment against the body of the defendant commanding that, unless the said fine and costs be forthwith paid, the defendant shall be committed to the jail of the county, and the constable or other officer to whose hand said *capias* or warrant shall come shall, in default of such payment, arrest the defendant and commit him to the jail of the county, there to remain, as provided by section 308 of "An act to revise the law in relation to criminal jurisprudence," in force July 1, 1874, unless such fine and cost shall sooner be paid.

Section 6. The addition of water or any foreign substance to milk or cream intended for sale or exchange is hereby declared an adulteration. Any milk that is obtained from cows fed on distillery waste, usually called "swills," or upon any substance in a state of putrefaction, is hereby declared to be impure and unwholesome. Nothing in this act shall be construed to prevent the addition of sugar in the manufacture of condensed or preserved milk.

Section 7. Section nine of division one of an act entitled "An act to revise the law in relation to criminal jurisprudence (approved March 27, 1874); and all other acts and parts of

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Laws of 1883, page 54 (Revised Statutes, chapter 5, section 29-32.)

AN ACT to require operators of butter and cheese factories on the co-operative plan to give bonds, and to prescribe penalties for the violation thereof. (Approved June 18, 1883.)

Section 1. That it shall be unlawful for any person or persons, company or corporation, within this state to operate, carry on, or conduct the business of manufacturing butter or cheese on the co-operative or dividend plan until such person or persons, company or corporation, shall have filed with the circuit clerk or recorder of deeds of the county in which it is proposed to

carry on such business, a good and sufficient bond, to be approved by such circuit clerk or recorder of deeds, in the penal sum of six hundred dollars, with one or more good sureties, conditioned that such person or persons, company or corporation proposing to carry on such business will, on or before the first day of each month, make, acknowledge, subscribe and swear to a report in writing, showing the amount of product manufactured, the amount sold, the prices received therefore, and the dividends earned and declared for the third month preceding the month in which such report is made and will file a copy of such report with the clerk of the town or precinct in which such factory is located, and will also keep publicly posted in a conspicuous place in such factory, a copy of such report for the inspection of the patrons thereof, and that such dividends shall be promptly paid to the persons entitled thereto.

Section 2. Such bond shall run to the people of the State of Illinois, and shall be for the benefit and protection of all patrons of such factory, and suit may be had thereon by any person or persons injured by a breach of the conditions thereof by any action of debt for the use of the person or persons interested for all damages sustained by them.

Section 3. Such bond shall be recorded by the circuit clerk or recorder with whom the same is filed, and all such reports so filed with any town or precinct clerk shall be preserved by him and held subject to the inspection of any person or persons interested.

Section 4. Any person who shall willfully violate any provision of this act shall be liable to a fine of not less than two hundred dollars or more than five hundred dollars, or imprisonment in the county jail for not less than thirty days nor more than six months, or both, in the discretion of the court.

Laws of 1879, page 11 (Revised Statutes, chapter 38, sections 39a-39c.)

AN ACT to prevent frauds in the manufacture and sale of butter and cheese. (Approved May 31, 1879.)

Section 1. That whoever manufactures, sells, or offers for sale, or causes the same to be done, any substance purporting to be butter or cheese, or having the semblance of butter or cheese, which substance is not made wholly from pure cream or pure milk, unless the same be manufactured under its true and appropriate name, and unless each package, roll, or parcel of such substance, and each vessel containing one or more packages of such substance, have distinctly and durably painted, stamped, or marked thereon the true and appropriate name of such substance, in ordinary boldfaced capital letters not less than five lines pica, shall be punished as provided in section 3 of this act.

Section 2. Whoever shall sell any such substance as is mentioned in section 1 of this act to consumers, or cause the same to be done, without delivering with each package, roll, or parcel so sold, a label on which is plainly and legibly printed in Roman letters, the true and appropriate name of such substance, shall be punished as is provided in section 3 of this act.

Section 3. Whoever knowingly violates section 1 or section 2 of this act shall be fined in any sum not less than ten nor more than three hundred dollars, or imprisoned in the county jail not less than ten nor more than ninety days, or both, in the discretion of the court; Provided, That nothing contained in this act shall be construed to prevent the use of skimmed milk, salt, rennet, or harmless coloring matter, in the manufacture of butter and cheese.

Laws of 1881, page 74 (Revised Statutes, chapter 38, sections 9f-9g.)

AN ACT to prevent the adulteration of butter and cheese, or the sale or disposal of the same, or the manufacture or sale of any article as a substitute for butter and cheese, or any

article to be used as butter and cheese. (Approved June 1, 1881.)

Section 1. That whoever manufactures out of any oleo-ginuous substances, or any compound of the same other than that produced from unadulterated milk or cream from the same, any article designed to take the place of butter or cheese produced from pure, unadulterated milk, or cream of the same, and shall sell, or offer for sale, the same as butter or cheese, or give to any person the same as an article of food, as butter or cheese, shall, on conviction thereof, be fined not less than twenty-five dollars nor more than two hundred dollars.

Section 2. All acts or parts of acts inconsistent with this act are hereby repealed.

Laws of 1881, page 75 (Revised Statutes, chapter 38, sections 9h-99o.)

AN ACT to prevent and punish the adulteration of articles of food, drink and medicine, and the sale thereof when adulterated. (Approved June 1, 1881.)

Section 1. That no person shall mix, color, stain, or powder, or order or permit any person in his or her employ to mix, color, stain or powder any article of food with any ingredient or material, so as to render the article injurious to health, or depreciate the value thereof, with the intent that the same may be sold; and no person shall sell or offer for sale any such article so mixed, colored, stained or powdered.

Section 3. No person shall mix, color, stain, or powder any article of food, drink, or medicine, or any article which enters into the composition of food, drink, or medicine, with any other ingredient or material, whether injurious to health or not, for the purpose of gain or profit, or sell, or offer the same for sale, or permit any person to sell or offer for sale any article so mixed, colored, stained, or powdered, unless the same be so manufactured, used, or sold, or offered for sale under its true and appropriate name, and notice that the same is mixed or impure is

marked, printed, or stamped upon each package, roll, parcel or vessel, containing the same, so as to be and remain at all times readily visible, or unless the person purchasing the same is fully informed by the seller of the true name and ingredients (if other than such as are known by the common name thereof) of such article of food, drink or medicine, at the time of making the sale thereof, or offering to sell the same.

Section 4. No person shall mix oleomargarine, suine, butterine, beef fat, lard, or any other foreign substance, with any butter or cheese intended for human food, without distinctly marking, stamping, or labeling the article, or the package containing the same, with the true and appropriate name of such article, and percentage in which such oleomargarine or suine enters into its composition; nor shall any person sell or offer for sale, or order or permit to be sold or offered for sale, any such article of food into the composition of which oleomargarine or suine, or butterine, beef fat, lard, or any other foreign substance of the fact, and the proportions in which such oleomargarine, suine, or butterine, beef, fat, lard, or any other foreign substance has entered into its composition. Provided, That nothing in this act shall be so construed as to prevent the use of harmless coloring matter in butter or cheese, or other articles of food.

Section 5: Any person convicted of violating any provisions of any of the foregoing sections of this act shall, for the first offense, be fined not less than twenty-five dollars nor more than two hundred; for the second offense he shall be fined not less than one hundred nor more than two hundred dollars, or confined in the county jail not less than one month nor more than six months, or both, at the discretion of the court; and for the third and all subsequent offenses he shall be fined not less than five hundred dollars nor more than two thousand dollars, and imprisoned in the penitentiary not less than one year nor more than five years.

Section 6, which makes ignorance of the provisions of the law a defense against prosecution, is repealed in the food commission bill.



Section 7. The State's Attorneys of this state are charged with the enforcement of this act, and it is hereby made their duty to appear for the people, and to attend to the prosecution of all complaints under this act, in their respective counties, in all courts.

Section 8. All acts and parts of acts incinsistent with the provisions o fthis act are hereby repealed.

Laws of 1897, page 3 (Revised Statutes, Chapter 38, Sections 339d-39n.)

AN ACT to regulate the manufacture and sale of substitutes for butter. (Approved June 14, 1897.)

Section 1. That for the purpose of this act every article, substitute, or compound other than that which is produced from pure milk or cream therefrom, made in the semblance of butter and designed to be used as a substitute for butter made from pure milk or its cream, is hereby declared to be imitation butter. Provided, That the use of salt and harmless coloring matter for coloring the product of pure milk or cream shall not be construed to render such product an imitation.

Section 2. No person shall coat, powder, or color with annatto or any coloring matter whatever any substance designed as a substitute for butter, whereby such substitute or product so colored or compounded shall be made to resemble butter, the product of the dairy. No person shall combine any animal fat or vegetable oil or other substance with butter or combined therewith or with animal fat or vegetable oil or combination of the two, or with either one, any other substance or substances, for the purpose or with the effect of imparting thereto a yellow color or any shade of yellow so that such substance shall resemble yellow or any shade of genuine yellow butter, nor introduce any of the articles of which the same is composed: Provided, Nothing in this act shall be construed to prohibit the use of salt,

rennet, and harmless coloring matter for coloring the products of pure milk or cream from the same.

No person shall, by himself, his agents, or employes, produce or manufacture any substance in imitation or semblance of natural butter, nor sell, nor keep for sale, nor offer for sale any imitation butter, made or manufactured, compounded or produced in violation of this section, whether such butter shall be made or produced in this state or elsewhere. This section shall not be construed to prohibit the manufacture and sale, under the regulations hereinafter provided, of substances designed to be used as a substitute for butter and not manufactured or colored as herein prohibited.

Section 3. Every person who lawfully manufactures any substance designed to be used as a substitute for butter shall mark by branding, stamping, or stenciling upon the top and sides of each tub, firkin, box, or other package in which said article shall be kept and in which it shall be removed from the place where it is produced, in a clean and durable manner, in the English language, the word "Oleomargarine," or the word "Butterine," or the words "Substitute for Butter," or the words "Imitation Butter," in printed letters in plain, Roman type, each of which shall not be less than three-quarters of an inch in length.

Section 4. It shall be unlawful to sell or offer for sale any imitation butter without informing the purchaser thereof, or the person or persons to whom the same is offered for sale, that substance sold or offered for sale is imitation butter.

Section 5: No person, by himself for another, shall ship, consign, or forward by any common carrier, whether public or private, any substance designed to be used as a substitute for butter, unless it shall be marked or branded on each tub, box, firkin, or other package containing the same, as provided in this act, and unless it be consigned by the carrier and receipted for by its true name: Provided, That this act shall not apply to any goods in transit between foreign States across the State of Illinois.

Section 6. No person shall have in his possession, or under his control, any substance designed to be used as a substitute for butter, unless the tub, firkin, jar, box, or other package containing the same be clearly and durably marked, as provided in this act: Provided, That this section shall not be deemed to apply to persons who have the same in their possession for the actual consumption for themselves or their families. Every person who shall have in his possession or control any imitation butter for the purpose of selling the same, which is not marked as required by the provisions of this act, shall be presumed to have known during the time of such possession or control the true character and name as fixed by this act of such product.

Section 7. Whoever shall have possession or control of any imitation butter or any substance designed to be used as a substitute for butter, contrary to the provisions of this act, for the purpose of selling the same, or offering the same for sale, shall be held to have possession of such property with intent to use it in violation of this act.

Section 8. No action shall be maintained on account of any sale or contract made in violation of or with the intent to violate this act by or through any person who was knowingly a party to such wrongful sale or contract.

Section 9. Whoever shall deface, erase, or remove any mark provided by this act, with intent to mislead, deceive, or to violate any of the provisions of this act, shall be guilty of a misdemeanor.

Section 10. Whoever shall violate any of the provisions of this act shall be punished by a fine of not less than fifty nor more than two hundred dollars, or by imprisonment in the county jail not to exceed sixty days, for each offense, or by both fine and imprisonment in the discretion of the court, or the fine alone may be sued for and recovered before any justice of the peace in the county where the offense shall be committed, at the instance of any person, in the name of the people of the State of Illinois as plaintiff.

Section 11. It is hereby made the duty of the State's

Attorney of each county in this state to prosecute all violations of this act upon complaint of any person, and there shall be taxed as his fees in the case the sum of ten dollars, which shall be taxed as costs in the case.

AN ACT to protect the public from imposition in relation to canned or preserved food. (Approved June 27, 1885.)

Section 1. That it shall hereafter be unlawful in this State for any packer or dealer in preserved or canned fruits and vegetables or other articles of food to offer such canned articles for sale after January 1, 1886, with the exception of goods brought from foreign countries, or packed prior to the passage of this act, unless such articles bear a mark to indicate the grade or quality together with the name and address of such firm, person, or corporation that packed the same or dealer who sells the same. The firm, person, or corporation labeling such goods shall be considered the packer or packers.

Section 3. Any person, firm, or corporation, who shall falsely stamp or label such cans or jars containing preserved fruit or food of any kind, or knowingly permit such false stamping or labeling, and any person, firm, or corporation who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor and punished with a fine of not less than fifty dollars; in the case of vendors, and in the case of manufacturers and those falsely or fraudulently stamping or labeling such cans or jars, a fine of not less than five hundred dollars nor more than one thousand dollars, and it shall be the duty of any board of health in this State cognizant of any violation of this act to prosecute any person, firm, or corporation which it has reason to believe has violated any of the provisions of this act, and after deducting the costs of the trial and conviction, to retain for the use of such board the balance of the fine or fines recovered.

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**PURE FOOD COMMISSIONER'S BILL.**

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For an act to provide for the appointment of a State Food Commissioner and to define his powers and duties and fix his compensation, and to prohibit and prevent adulteration, fraud and deception, in the manufacture and sale of articles of food, and to repeal certain acts or parts of acts therein named.

Section 1. Be it enacted by the People of the State of Illinois represented in the General Assembly: That the office of State Food Commissioner for the State of Illinois is hereby created. Within thirty days after this act shall take effect such commissioner shall be appointed by the Governor, by and with the advice and consent of the Senate, and his term of office shall be for two (2) years from the date of his appointment and until his successor is appointed and qualified. Thereafter the term of office of the commissioner shall be for four years and until his successor is qualified. The salary of the Commissioner shall be twenty-five hundred dollars (\$2,500) per annum and his necessary and actual expenses incurred in the discharge of his official duties.

2. Such commissioner may, with the advice and consent of the Governor, appoint two assistant commissioners, each of acknowledged standing, ability, and integrity, one of whom shall be an expert in the matter of dairy products, and the other of whom shall be a practical and analytical chemist, who shall be known as State analyst. The salaries of such assistants shall not exceed eighteen hundred dollars (\$1,800) each per annum and their necessary and actual expenses incurred in the discharge of their official duties. In case of the absence or inability of the State analyst to perform all the duties of his office, the commis-



sioner may appoint some competent person to assist in the same temporarily.

3. The food commissioner shall have authority to appoint necessary inspectors not exceeding six in number or to assist in the work of the food commissioner at such times and for such periods of time as may be required in the enforcement of the dairy food laws of the State. Such inspectors shall have the same right of access to places to be inspected as the commissioner. The compensation of such inspectors shall be three dollars (\$3.00) per day for each day of actual service, and their necessary and actual expenses when so employed.

4. It shall be the duty of the commissioner to enforce all laws that now exist or that may hereafter be enacted in this State regarding the production, manufacture, or sale of dairy products, or the adulteration of any article of food, and personally or by his assistants to inspect any article of food made or offered for sale within this State, which he may, through himself, or his assistants, suspect or have reason to believe to be impure, unhealthy, adulterated or counterfeit, and to prosecute, or cause to be prosecuted, any person or persons, firm or firms, corporation or corporations, engaged in the manufacture or sale of any adulterated or counterfeit articles of food contrary to the laws of this state.

5. It shall be the duty of the food commissioner to carefully inquire into the quality of the dairy and food products, and the several articles which are foods or the necessary constituents of food, which are manufactured for sale or sold or exposed or offered for sale in this State, and he may in a lawful manner procure samples of the same, and direct the state analyst to make due and careful examination of the same, and report to the commissioner the result of the analysis of all or any such food or dairy products as are adulterated, impure or unwholesome, in contravention of the laws of this State, and it shall be the duty of the commissioner to make complaint against the manufacturer or vender thereof in the proper county, and furnish the prosecuting

attorney with the evidence thereon and thereof to obtain a conviction for the offense charged. The food commissioner, or his assistants, or any person by him duly appointed for that purpose, shall have power in the performance of their duties to enter any dairy, creamery, cheese factory, store, salesroom, warehouse (except bounded warehouses for the storage of distilled spirits), where goods are stored or exposed for sale, or place where they have reason to believe food is stored or offered for sale, and to open any cask, tub, jar, bottle or package containing or supposed to contain any article of food, and examine or cause to be examined the contents thereof, and take therefrom samples for analysis. The person making such inspection shall take such samples of such articles of produce, in the presence of at least one witness, and he shall, in the presence of such witness, mark or seal such sample and shall tender, at the time of taking, to the manufacturer or vender of such produce, or to the person having the custody of the same, the value thereof, but if the person from whom such sample is taken shall request him to do so, he shall, at the same time and in the presence of the person from whom such property is taken, securely seal up two samples of the article seized or taken, the one of which shall be for examination or analysis under the direction of the commissioner, and the other of which shall be delivered to the person from whom the article was taken. Any person who shall obstruct the commissioner or any of his assistants by refusing to allow him entrance to any place which he desires to enter in the discharge of his official duty, or refuse to deliver to him a sample of any article of food made, sold or exposed for sale by such person, when the same is requested, and when the value thereof is tendered, shall be guilty of a misdemeanor, punishable by a fine of not exceeding fifty dollars (\$50.00) for the first offense, and not exceeding five hundred dollars (\$500.00) or less than fifty dollars (\$50.00) for each subsequent offense.

6. It shall be the duty of the state's attorney in any county of the State, when called upon by the commissioner or any of his assistants, to render any legal assistance in his power to

execute the laws and to presecute cases arising under the provisions of this act.

7. The State board of health may submit to the commissioner, or to any of his assistants, samples of food or drink for examination or analysis, and shall receive special reports, showing the results of such examination or analysis.

8. It shall be unlawful for the State analyst, while he holds his office, to furnish to any individual, firm or corporation any certificate as to the purity or excellence of any article manufactured or sold by them to be used as food or in the preparation of food.

9. The salary of the commissioner shall be paid from the fund appropriated for the payment of the salaries of State officers, and his assistants shall be paid out of the State treasury from the same fund and in the same manner as the salaries of other employes of the State are paid, and their official expenses shall be paid at the end of each calendar month upon bills duly itemized and approved by the Governor, and the amount necessary to pay such salaries and expenses is hereby appropriated.

10. The commissioner may, under the direction of the Governor, fit up a laboratory, with sufficient apparatus for making analysis contemplated in this act, and for such purpose the sum of fifteen hundred dollars (\$1,500), or so much thereof as may be necessary, is hereby appropriated; and for the purpose of providing materials, and for necessary expenses connected with the making of such analysis, there is also hereby appropriated so much as may be necessary, not exceeding six hundred dollars (\$600) annually. The appropriation provided for in this section shall be drawn from the State treasury upon certified bills approved by the Governor.

11. The commissioner shall make an annual report to the Governor on or before the first day of January in each year, which shall be printed and published. Such report shall cover the doings of his office for the preceding year and shall show, among other things, the number of factories, creameries and other places inspected, and by whom; the number of specimens

of food articles analyzed, and the State analyst's report upon each one when the analysis indicates the same to be contrary to law; the number of complaints entered against persons for violation of the laws relative to the adulteration of food; the number of convictions had and the amount of fines imposed therefor, together with such recommendations relative to the statutes in force as his experience may justify. The commissioner may also prepare, print and distribute to the newspapers of the State, and to such persons as may be interested or may apply therefor, a monthly bulletin containing results of inspections, the results of analysis made by the State analyst of articles offered for sale contrary to law, with popular explanation of the same, and such other information as may come to him in his official capacity relating to the adulteration of food and drink products and of dairy products, so far as he may deem the same of benefit and advantage to the public; also a brief summary of all the work done during the month by the commissioner and his assistants in the enforcement of the laws of the State, but not more than ten thousand copies of each of such monthly bulletins shall be printed: Provided the necessary printing shall be done by the State printer, and all expenses for stationery and printing shall be audited and paid from the same fund and in the same manner as other State printing and stationery.

All fines, penalties and costs recovered for violations of this act and other acts now enacted or hereafter to be enacted prohibiting or regulating the adulteration of foods shall be paid into the State treasury to the credit of the general fund of the State.

12. No person shall, within this state, manufacture for sale, have in his possession with intent to sell, offer for sale, or sell any article of food which is adulterated within the meaning of this act.

13. The term "food," as used herein, shall include all articles whether simple, mixed or compound, used for food, candy, drink or condiment by man or domestic animals.

14. An article shall be deemed to be adulterated within the meaning of this act:

First—If any substance or substances has or have been mixed with it so as to depreciate, lower or injuriously affect its quality, strength or purity.

Second—If any inferior or cheaper substance or substances has or have been substituted wholly or in part for the article.

Third—If any valuable necessary constituent or ingredient has been wholly or in part abstracted from it.

Fourth—If it be an imitation of and sold under the name of another article.

Fifth—If it is mixed, colored, coated, polished or powdered, whereby damage or inferiority is concealed, or if by any means it is made to appear better or of greater value than it really is.

Sixth—If it contains wholly or in part of a decomposed, putrid, infected, tainted or rotten animal or vegetable substance or article, whether manufactured or not, or, if it is the produce of a diseased animal, or if of an animal that has died otherwise than by slaughter. Provided, that an article of food that does not contain any ingredient injurious to health, and in the case of mixtures or compounds, which may be now, or from time to time hereafter, known as articles of food under their own distinctive names, or which shall be labeled so as to plainly indicate that they are mixtures, combinations, compounds or blends, and not included in definition fourth of this section, shall not be deemed to have been adulterated. Provided, further, that all manufactured articles of food offered for sale shall be distinctly labeled, marked or branded with the name of the manufacturer and place of manufacture, or the name and address of the packer or dealer who sells the same.

15. No person shall manufacture for sale, offer or expose for sale, sell or deliver, or have in his possession with intent to sell or deliver, any vinegar not in compliance with the provisions of this act. No vinegar shall be sold as apple, orchard or cider vinegar which is not the product of pure apple juice, known as apple cider and apple orchard or cider vinegar upon test shall contain not less than one and three-fourths per cent, by weight,



of cider vinegar solids upon full evaporation at the temperature of boiling water.

16. All vinegar made by fermentation and oxidation without the intervention of distillation shall be branded with the name of the fruit or substance from which the same is made. All vinegar made wholly or in part from distilled liquor shall be branded "distilled vinegar." All fermented vinegar, not distilled, shall contain not less than one and one-fourth per cent, by weight, upon full evaporation (at the temperature of boiling water), of solids contained in the fruit from which said vinegar is fermented, and said vinegar shall contain not less than two and a half tenths of one per cent ash or mineral matter, the same being the product of the material from which said vinegar is manufactured. All vinegar shall be made wholly from the fruit or grain from which it purports to be or is represented to be made, shall contain no foreign substance, and shall contain not less than four per cent, by weight, of absolute acetic acid.

17. No person shall manufacture for sale, offer for sale or have in his possession with intent to sell, any vinegar found upon test to contain any preparation of lead, copper, sulphuric acid or other mineral acid, or other ingredients injurious to health. All packages containing vinegar shall be marked, stenciled or branded on the head of the cask, barrel or keg containing such vinegar, with the name and residence of the manufacturer or dealer, together with the brand required in section 16 of this act.

18. No person shall offer for sale, sell or deliver for food or drink purposes, ice, natural or manufactured, containing any decomposed, putrid, infected, tainted or rotten animal or vegetable substance or any ingredient which is poisonous or injurious to health. If intended for food or drinking purposes, shall not be composed of water of lower standard of purity than that required for domestic purposes by the State Board of Health.

19. Any person or persons manufacturing for sale or selling or offering to sell any candies or confectioneries adulterated by the admixture of terra alba, barytes, talc or other earthly or mineral substances, or any poisonous colors, flavors or ex-

tracts or other deleterious ingredients detrimental to health, shall, upon proper conviction thereof, be punished by a fine of not less than ten nor more than one hundred dollars or imprisonment in the county jail not less than ten nor more than thirty days, or both such fine and imprisonment, in the discretion of the court.

20. No packer or dealer in preserved or canned fruits and vegetables or other articles of food, shall sell or offer for sale such canned or preserved fruits and vegetables or other articles of food, unless such articles bear a mark, stamp, brand or label bearing the name and address of the firm, person or corporation that packs same, or dealer that sells same. All soaked or bleached goods or goods put up from products dried before canning, shall be plainly marked, branded, stamped or labelled as such, with the words "Soaked" or "Bleached Goods" in letters not less than two-line pica in size, showing the name of the article and name and address of the packer or dealer who sells same.

21. No person shall manufacture for sale, have in his possession with intent to sell, offer or expose for sale, or sell as fruit, jelly, jam, or fruit butter, any jelly, jam or imitation fruit similar compound made or composed, in whole or in part, of glucose, dextrine, starch or other substance, and colored in imitation of fruit jelly, jam or fruit butter; nor shall any such jelly, jam or fruit butter or compound be manufactured or sold, or offered for sale, under any name or designation whatever, unless the same shall be composed entirely of ingredients not injurious to health; and every can, pail or package of such jelly, jam or butter sold in this state shall be distinctly and durably labelled "imitation fruit, jelly, jam, or butter," with the name and address of manufacturer or dealer who sells same.

22. Extracts made of more than one principle must be labeled with the name of each principle or else simply with the name of the inferior or adulterant.

In all cases when an extract is labeled with two or more names, the type used is to be similar in size and the name of any one of the articles used is not to be given greater prominence

than another. The word compound cannot be used. Extracts which cannot be made with fruit, berry, strawberry, etc., shall be labeled "artificial." Chocolates and cocoas must not contain substances other than cocoa mass, sugar and flavoring and will not be required to be labeled "compound" or "mixture." Prepared cocoanut, if so labeled, shall contain nothing but cocoanut, sugar and glycerine, and shall not be classed as compound or mixture.

23. Whoever shall falsebrand, mark, stencil or label any article or product required by this act to be branded, marked, stenciled or labeled or shall remove, alter, deface, mutilate, obliterate, imitate or counterfeit any brand, mark, stencil or label so required, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than twenty-five nor more than two hundred dollars, and costs of prosecution, or by imprisonment in the county jail for not less than thirty days nor more than ninety days, or by both such fine and imprisonment in the discretion of the court, for each and every offense.

24. The taking of orders, or the making of agreements or contracts by any person, firm or corporation, or by any agent or representative thereof, for the future delivery of any of the articles, products, goods, wares or merchandise embraced within the provision of this act, shall be deemed a sale within the meaning of this act.

25. Every person manufacturing, offering or exposing for sale or delivery to a purchaser any article intended for food, shall furnish to any person, or analyst or other officer or agent appointed hereunder who shall apply to him for the purpose and shall tender him the value of the same, a sample sufficient for the analysis of any such article which is in his possession. Whoever hinders, obstructs or in any way interferes with any inspector, analyst or other officer appointed hereunder, in the performance of his duty, and whoever wilfully neglects or refuses to do any of the provisions of this act, shall be guilty of a misdemeanor, and upon conviction shall, where no specific penalty is prescribed

by this act, be punished by a fine not exceeding two hundred nor less than twenty-five dollars, or by imprisonment in the county jail for a period not exceeding ninety days, or by both such fine and imprisonment, in the discretion of the court.

26. All acts and parts of acts inconsistent with this act, and section 6 of an act entitled "An act to prevent the adulteration of butter and cheese, or the sale and disposal of the same, or the manufacture or sale of any article as a substitute for butter or cheese, or any article to be used as butter and cheese," approved June 1, 1881, be and they are hereby repealed.

27. For the purpose of enabling dealers in products affected by this act to dispose of same without loss, it is hereby expressly provided that the penalties of this act, and prosecution under the same, are suspended until the first day of July, 1900.

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#### TESTING INDIVIDUAL COWS.

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By Herbert A. Hopper, Assistant in Dairy Husbandry, University of Illinois, Agricultural Experiment Station.

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Success in dairying as in most other kinds of business requires attention to details. In the economical production of milk for whatever purpose, the cow is an important factor which must be dealt with, and the wisdom and business foresight exercised in her selection and management will determine the success of the undertaking. The object of this circular is to show the importance of studying the production of each cow in the herd, if the owner is to realize the most from his efforts. The tables and discussions of the herds which follow are given to point out some of the mistakes made not only in keeping poor cows, but also in according them poor rations and improper care. The records should be of especial interest because they were taken from herds maintained under the conditions prevailing upon dairy farms of the State and embrace not only a wide range of produc-

tion, but also many conditions of environment. A careful study of the following cannot fail to convince the reader of the importance of the scales and Babcock test in assisting the dairyman to place his herd on a more profitable basis.

#### The Herds.

Some time ago the Department of Dairy Husbandry began field work in Southern Illinois for the express purpose of pointing out to the dairymen the necessity of testing the individual cows in their herds. The inferior condition of many of the herds has long been known to the Station, but it was thought an actual demonstration of the fact upon the farms where these herds are kept would be influential in inaugurating a movement toward better cows. In accordance with this conclusion, herds were selected for the purpose, located at different places in the St. Louis dairy district and in various outlying creamery districts in the southern part of the state. Since the work began, the cows in twenty-nine different herds have been tested for longer or shorter periods. The intention at the outset was to secure a record of the annual production of each cow in the herd, but there are so many disturbing influences such as the selling of cows, and the practice of allowing the calves to suck their dams that many animals were dropped out. However, eighteen herds including 221 cows have completed a year's record, and these only have been used in this circular. In order to make the data as reliable as possible the herds were selected with reference to the standing of the owners in their respective communities. The geographical location of the herds was such as to furnish as many points of contact, and secure data from as many places as possible.

#### How the Test Was Made.

Each dairyman was furnished scales, sample bottles, milk record sheets and preservative tablets. In all but two herds the milk record was obtained by weighing each milking throughout the year. In the two exceptions the milk was weighed only during the week when samples were taken, the intermediate amounts being calculated. The butter fat production was obtained by



taking a composite sample of each cow's milk for seven consecutive days at intervals of nine weeks. The butter fat in this sample was determined by the Babcock test, and the result obtained was used as the average percentage of butter fat in the milk produced during the four weeks preceding and the four weeks following as well as during the test week. That is, the week when samples were taken was made the middle of a nine-week period. Before this work was begun the complete milk and butter fat records of the cows in the University dairy herd was studied to see how closely the annual production of butter fat could be determined by weighing the milk continuously and testing a composite sample taken every ninth week. It was found by using the amounts of milk yielded by the cows during the successive weeks and the test of every ninth week as above indicated, that the yearly production of butter fat could be calculated, on the average, within five per cent of the actual amount. The records about to be discussed were obtained in the way just indicated. Little difficulty was experienced in persuading the men to weigh their milk continuously, which when once started has been quite generally continued even after the immediate influence of the Station has been withdrawn. The samples in all cases were carefully tested by a representative of the University.

#### Explanation of Data.

In order to present the data on these herds in the most comprehensive manner, the records of the cows in a given herd, together with the value of their products at a uniform price, are combined in one table. This allows the reader to compare the individuals not only as to production, but upon the money basis as well. At the head of each table is given the record and value of the milk and butter fat of the best cow, poorest cow, and the average of the herd. With the breed and age given, it allows one to take in at a glance the range of production, making such allowances as necessary for the maturity of the animal and its breeding. Unless otherwise stated, the records are for one years duration. In tables 1 and 4, the exact length of the lactation period is not known, so that the average milk and fat per day are not

given. Where supplementary tables are given to illustrate a certain point they are self-explanatory. An attempt has been made to discuss the care and management of each herd so as to show some of its peculiar problems, and how they have been successfully or unsuccessfully met. Inasmuch as the feeding of the herd is such an important item in determining success, the amount and composition of the ration is given whenever possible. No accurate record was kept of the amount of food consumed by the various cows on the different farms except in herd 7 where the data was complete enough to justify an approximation. However, the amounts mentioned in the other herds are fairly correct and are inserted to illustrate the numerous ways of attempting to solve the feeding problem. It should be noted that, inasmuch as butter fat is the most varied and at present the most valuable constituent of milk, the herds are ranked upon that basis. The records that follow are to be studied rather than simply read, for they illustrate principles that the man who desires to succeed cannot well afford to ignore.

#### Herd No. 1.

The cows in this herd, at the beginning, were a mixed lot of natives, together with a few grade Jerseys and others of ill-defined parentage. In spite of the fact that they were not an attractive herd and were unfortunately housed in a cold, dark stable, all but one produced over fifty dollars worth of butter fat. This return is due in considerable degree to the skill of the owner and feeder, who although he professed to be a novice, was able to supply the needs of his individual cows very successfully. Cows Nos. 6, 7 and 9 were soon removed because of inefficiency. Most of the cows came fresh in the fall or early in winter allowing the owner to take advantage of the higher prices for milk at that season. With this arrangement the influence of heat and flies came at a time when many cows were dry. During the winter months cows in milk received eight pounds of bran, ten pounds of corn and cob meal, one pound of oil meal, and what they would consume of clover hay and corn stover. Those milk-

ing lightly or not at all, received about five pounds of bran, six pounds corn and cob meal, with what clover hay and corn stover they would eat. Here, as in most cases where good results are obtained, the owner was successful in having the food eaten up clean and in keeping the cows in good health. The testing of this herd was a source of considerable interest to the owner throughout the year and led him to a greater appreciation of the differences in cows. He has recently added to his herd a pure-bred sire of excellent breeding and some pure-bred females.

Table 1. Herd No. 1.

| No.                   | Total milk | Percent fat. | Value milk Value |                    |                  | Age. | Breed.        |
|-----------------------|------------|--------------|------------------|--------------------|------------------|------|---------------|
|                       |            |              | Total fat.       | at \$1.15 per 100. | 25c lb. B. F. at |      |               |
| Best cow . . . 10     | 6099.30    | 5.17         | 315.38           | \$70.14            | \$78.84          | 7    | Gr. Jersey.   |
| Poorest cow. 4        | 4391.30    | 3.91         | 171.67           | 50.49              | 42.91            | 8    | Native.       |
| Av. of herd . . . . . | 5753.05    | 4.54         | 261.61           | \$66.16            | \$65.40          |      |               |
| 1                     | 6137.8     | 4.76         | 292.75           | \$70.58            | \$73.18          | 15   | Jersey.       |
| 2                     | 5391.0     | 4.09         | 220.55           | 61.91              | 55.13            | 10   | Native.       |
| 3                     | 6881.9     | 4.17         | 287.03           | 79.14              | 71.75            | 7    | Gr. Holstein. |
| 4                     | 4391.3     | 3.91         | 171.67           | 50.40              | 42.91            | 8    | Native.       |
| 5                     | 4956.9     | 4.19         | 208.03           | 57.00              | 52.00            | 7    | Gr. Jersey.   |
| 8                     | 5864.8     | 4.62         | 271.15           | 66.35              | 67.79            | 8    | Gr. Jersey.   |
| 10                    | 6099.3     | 5.17         | 315.38           | 70.14              | 78.84            | 7    | Gr. Jersey.   |
| 11                    | 5288.6     | 5.26         | 278.65           | 60.92              | 69.66            | 5    | Gr. Jersey.   |
| 12                    | 6485.9     | 4.67         | 303.50           | 74.59              | 75.80            | 9    | Native.       |
| 13                    | 6374.9     | 4.32         | 275.85           | 71.31              | 68.96            | 6    | Gr Jersey.    |
| 14                    | 5411.2     | 4.67         | 253.16           | 62.23              | 63.29            | 9    | Gr Holstein.  |
|                       | 63283.6    |              | 2877.77          | \$724.66           | \$719.31         |      |               |

## Herd No. 2.

F. M. R.

This herd at the outset was composed of nine grade Holsteins and one grade Jersey, the poorest, No. 5, producing 193.29 pounds, the best No. 8, yielding 333.35 pounds of butter fat. Cows Nos. 4 and 7 were removed early because of their low production. A pure-bred sire has been maintained in this herd for some time with beneficial results. The herd was kept in a clean, comfortable, well lighted stable, and fed a liberal amount. At all times the cows received good care which contributed very

much to their production. In summer the herd was kept on pasture with three pounds of bran in addition. During late summer and early fall, when the pastures became short, the cows received about three pounds of gluten feed and as much oat hay and millet as they could eat up clean. During the winter months those in full flow of milk received a ration composed of five pounds of bran, five pounds of corn and cob meal, and what clover hay and chredded corn stover they could eat. Those yielding less milk received less bran. On the whole, the herd was cheaply fed, the coarse farm foods being well consumed. Nevertheless, this herd would have returned a larger profit if the ration had contained corn silage and cowpea hay, in which case less grain would have been required, giving a corresponding reduction in the cost of production. As the milk was not sold to condensory the corn might well have been placed in the silo and thus served as a source of succulence in the ration.

Table 2. Herd No. 2.

F. M. R.

|                  | No.          | Total milk | Percent fat. | Total fat | Av. milk per day | Av. fat per day | Value milk at \$1.15 per 100 | Value B. F. at 25c lb. | Age | Breed        |
|------------------|--------------|------------|--------------|-----------|------------------|-----------------|------------------------------|------------------------|-----|--------------|
| Best cow . . .   | 8            | 8738.7     | 3.81         | 333.35    | 30.02            | 1.145           | \$100.50                     | \$83.34                | 8   | Gr. Holstein |
| Poorest cow . .  | 5            | 4928.4     | 3.92         | 193.29    | 17.23            | .675            | 56.68                        | 48.32                  | 6   | Gr. Holstein |
| Av. of herd. . . | ..           | 7376.4     | 3.19         | 267.75    | 22.52            | .817            | \$84.82                      | \$66.93                | ... |              |
| No. cow.         | Days in milk |            |              |           |                  |                 |                              |                        |     |              |
| 1                | 323          | 5947.6     | 3.63         | 217.62    | 18.41            | .673            | \$68.39                      | \$54.40                | 4   | Gr. Holstein |
| 2                | 365          | 7979.0     | 3.52         | 280.96    | 21.86            | .767            | 91.76                        | 70.24                  | 4   | Gr. Holstein |
| 3                | 348          | 7887.2     | 3.59         | 282.48    | 22.66            | .811            | 90.70                        | 70.62                  | 4   | Gr. Holstein |
| 5                | 286          | 4928.4     | 3.92         | 193.29    | 17.23            | .675            | 56.68                        | 48.32                  | 6   | Gr. Holstein |
| 6                | 365          | 7887.8     | 3.20         | 252.25    | 21.61            | .691            | 90.71                        | 63.66                  | 6   | Gr. Holstein |
| 8                | 291          | 8738.7     | 3.81         | 333.35    | 30.02            | 1.145           | 100.50                       | 83.34                  | 8   | Gr. Holstein |
| 9                | 293          | 8554.9     | 3.75         | 320.57    | 29.19            | 1.094           | 98.38                        | 80.14                  | 10  | Gr. Holstein |
| 10               | 349          | 7088.2     | 3.69         | 261.51    | 20.31            | .749            | 81.51                        | 65.38                  | 7   | Gr. Jersey   |
| ..               | ..           | 59011.8    | ....         | 2142.03   | .....            | .....           | \$678.63                     | \$535.50               | ..  |              |

**Herd No. 3.**

In many ways herd No. 3 is the most interesting of all and teaches one of the best lessons of any included in this report. At the beginning of the test it was composed of ten native cows. For several years the owner had been relying upon the available milch cows in the immediate neighborhood as a source from which to replenish his herd when removals were necessary. The milk was taken daily from the farm by a hauler to the local pasteurizing plant from which it was sent to St. Louis for direct consumption. Although the owner was progressive in other matters about his farm, he had completely overlooked the actually low productive capacity of the cows in his herd, until his attention was called to it by the use of the scales and the Babcock test. At the time the matter of testing his cows was suggested to him, he seemed favorably impressed, but gave no intimation of the radical results that were soon to be realized. After weighing the milk from his individual cows for two months and having two sets of composite samples tested, he became suddenly aware that their productive ability was not in keeping with his standards of excellence. In accordance with this conclusion, he sold seven of the poorest cows for \$160.00 and shortly afterward bought a registered cow for \$150.00, making the remark at the time, that perhaps he had better invest the remaining \$10.00 in bran in order that this new cow might be induced to produce to the best of her ability. When visited shortly after this transaction and asked why he made such a decided change, he said: "I didn't know my cows were so poor; I cannot produce milk with them so cheaply as I should." Pointing to the milk scales which had been furnished him and which he had been studiously employing he said: "I would not take one hundred dollars for them; they have been worth that to me." He also took occasion to say that he had no intention of discontinuing the test but was bent on supplying himself with cows worth the while. Let us pass now to a consideration of the records which prompted such action.

In table 3 is given the weekly production of the seven cows



which were sold, as revealed by the first test, and also the amount produced

## Herd No. 3.

Table 3. Comparing the Production of 7 Cows Which Were Sold With the Production of Those Substituted for Them.

| No. of cow.  | Date of calving. | Test week ending. | Pounds milk. | Percent fat. | Pounds butter fat. | Year's Record. |         |
|--------------|------------------|-------------------|--------------|--------------|--------------------|----------------|---------|
|              |                  |                   |              |              |                    | Milk.          | B. fat. |
| 2            | Aug. 16          | Dec. 26           | 81.8         | 5.0          | 4.09               | .....          | .....   |
| 3            | Oct. 8           | Dec. 26           | 95.6         | 4.2          | 4.01               | .....          | .....   |
| 4            | Oct. 16          | Dec. 26           | 156.1        | 4.3          | 6.71               | .....          | .....   |
| 5            | July 20          | Dec. 26           | 90.9         | 4.6          | 4.18               | .....          | .....   |
| 6            | June 15          | Dec. 26           | 132.0        | 4.0          | 5.28               | .....          | .....   |
| 7            | July 25          | Dec. 26           | 119.6        | 4.2          | 5.02               | .....          | .....   |
| 8            | Oct. 5           | Dec. 26           | 116.7        | 4.2          | 4.90               | .....          | .....   |
| Average..... |                  |                   | 113.24       | 4.3          | 4.88               | .....          | .....   |

## Cows Substituted.

|              |          |         |        |     |       |         |        |
|--------------|----------|---------|--------|-----|-------|---------|--------|
| 10           | Jan. 31  | Feb. 27 | 202.9  | 4.2 | 8.52  | 7547.8  | 308.07 |
| 11           | Feb. 25  | Apr. 29 | 158.7  | 3.2 | 5.08  | 6719.1  | 221.13 |
| 12           | June 25  | Sept. 2 | 196.6  | 3.4 | 6.69  | 7590.2  | 261.50 |
| 13           | Sept. 15 | Nov. 4  | 220.5  | 3.0 | 6.62  | 8972.5  | 263.52 |
| 14           | Jan. 10  | Mar. 10 | 256.9  | 3.4 | 8.73  | 9454.3  | 324.08 |
| 15           | Dec 26   | Jan. 6  | 210.9  | 4.7 | 9.91  | .....   | .....  |
| 16           | June 18  | July 14 | 189.0  | 4.0 | 7.56  | .....   | .....  |
| 17           | June 6   | July 14 | 277.8  | 4.6 | 12.68 | .....   | .....  |
| 18           | Sept. 17 | Nov. 17 | 263.3  | 2.8 | 7.37  | .....   | .....  |
| 19           | Nov. 4   | Nov. 17 | 264.8  | 3.4 | 9.00  | .....   | .....  |
| Average..... |          |         | 224.14 | 3.6 | 8.21  | 8056.78 | 275.78 |

Cows Nos. 1 and 9 did not complete a year.

Table 4. Herd No. 3.

|                | No.           | Total milk | Percent fat | Total fat | Av. milk per day | Av. fat per day | Value milk at \$1.15 per 100 | Value B. F. at 25c lb. | Age | Breed        |
|----------------|---------------|------------|-------------|-----------|------------------|-----------------|------------------------------|------------------------|-----|--------------|
| Best cow....   | 14            | 9454.3     | 3.40        | 324.08    | 30.79            | 1.055           | \$108.72                     | \$81.02                | 3   | Gr. Holstein |
| Poorest cow    | 11            | 6719.1     | 3.27        | 221.13    | 22.70            | .747            | 77.26                        | 55.28                  | 6   | Reg. Holst'n |
| Av. of herd .. |               | 8056.78    | 3.42        | 275.78    | 25.88            | .886            | \$92.65                      | \$68.94                | ..  |              |
| No. cow.       | Days in milk. |            |             |           |                  |                 |                              |                        |     |              |
| 10             | 330           | 7547.8     | 4.08        | 308.07    | 22.87            | .933            | \$86.80                      | \$77.02                | 7   | Gr. Shorth'n |
| 11             | 296           | 6719.1     | 3.27        | 221.13    | 22.70            | .747            | 77.26                        | 55.28                  | 6   | Reg. Holst'n |
| 12             | 340           | 7590.2     | 3.44        | 261.50    | 22.32            | .763            | 87.28                        | 65.37                  | 6   | Gr. Shorth'n |
| 13             | 283           | 8972.5     | 2.94        | 263.52    | 31.70            | .931            | 103.18                       | 65.88                  | 3   | Reg. Holst'n |
| 14             | 307           | 9454.2     | 3.40        | 324.08    | 30.79            | 1.055           | 108.72                       | 81.02                  | 3   | Gr. Holstein |
| ..             | ...           | 40283.9    | ....        | 1378.93   | .....            | .....           | \$463.24                     | \$344.57               | ..  |              |

by the cows substituted for them during the first weekly test. The owner began to go beyond the boundaries of his own community to buy cows of approved ability, and the comparison made here is to show how rapidly the standard of production was raised. The dates of calving and the date when the test week ended are given in each group to show how long the cows had been fresh. Although the stage of lactation and the season of the year are not entirely comparable in the two groups, the superior excellence of the latter is apparent. Notice that the average yield per week of the seven cows which were sold is 113.24 pounds of milk and 4.88 lbs. butter fat, while for the other cows it is 224.14 lbs. milk and 8.21 lbs. of butter fat, the production in the latter case being nearly twice as much as in the former. The season or improper food, cannot be offered as a valid excuse for the low production of the original herd, because it was well fed so that cows of proper capacity calving on August 16th and October 18th should have been yielding more than 81.8 and 95.6 pounds of milk, respectively, per week. Some of the new cows, after having been in milk two months during the fall, were producing from 220 to 264 pounds of milk per week, containing as high as nine pounds of butter fat. If the yearly production of the original herd could have been obtained, it would stand in striking contrast to the annual production of cows 10 to 14, inclusive. The fact is, the owner felt they were too poor to be retained in a herd where progressive methods were in vogue. However, one should be careful about disposing of a cow on the evidence of one or two tests unless he happens to know she is not a persistent producer. For example: No. 4 was yielding enough at the time of testing to justify her retention in the herd, but the owner happened to know she would not hold out.

Table 4 gives the annual production of all the cows in Herd 3 that completed a year's record. The best cow yielded 324.0 pounds of butter fat, while the poorest one produced 221.13 pounds of butter fat. In justice to cow No. 11, it should be said that she is a good individual, but that her low record was due to excessive crowding the previous year. She is now well

along on her second year, and shows considerable improvement. An average production of 8056.78 pounds of milk and 275.78 pounds of butter fat per cow indicates the excellent capacity of the new members of this herd. This return has been obtained from a ration made up very largely of farm grown-foods. In winter the herd received 10 to 12 pounds of clover hay and what corn fodder they would eat, together with an allowance of grain made up of 8 pounds of bran, one-half pound of oil meal, and 4 pounds of corn meal, the quantity being varied in accordance with the age and period of lactation of the cows. In summer the herd was maintained upon excellent pasture supplemented in the early part of the season by one pound of ground oats per day. The results obtained by this dairyman may be easily duplicated upon any dairy farm, by the application of a few established principles to the problems involved. There is not only great financial return, but also great feeling of satisfaction in possessing animals of quality, the offspring of which show unmistakable indications of developing into agents of still higher productive ability.

#### Herd No. 4.

In this herd we find a wider range of production than in the one just discussed. The owner, a patron of a condensory, was never thoroughly convinced that he ought to be a dairyman and consequently never put as much study into his dairy work as he would undoubtedly have done had he felt more keenly the importance of that branch of his farm operations. The fact that his milk, for a larger part of the year was delivered by a hauler, removed all possibility of his adding to his supply of dairy enthusiasm by coming in daily contact with other dairymen, or the manager of the plant. His herd consisted of grade Jerseys, Holsteins, and Shorthorns, some of which were quite profitable, judging from the butter fat they produced, while others made rather poor records. He has been careful at all times to use either a grade Shorthorn bull or a Hereford so that his calves may be more readily turned for veal, ignoring his excellent op-

portunity to grade up his herd by the use of a pure bred dairy sire. The most of his cows would make excellent foundation animals for an effort of this kind. The farm, which is rented, has carried a large number of cattle in past years, consequently its state of fertility is such that rough food for the herd is produced abundantly and easily. The herd was fed largely upon farm-grown foods, cowpea hay making up a large part of the ration during the winter months. This, together with the use of farm-grown grains assisted materially in reducing the cost of milk production. The pasture was abundant and of fine quality. During the winter months the herd received for roughness, corn stover, oat hay, and cowpea hay in liberal amounts. For concentrates there was little fed, besides bran and corn and cob meal except for about three weeks. Sucrene, a proprietary dairy feed, was given. The cows were provided with a comfortable stable though it was dark and rather poorly arranged. The health of the animals was good.

Table 5. Herd No. 4.

|               | No. cow | Total milk | Percent fat | Total fat | Value milk at \$1.15 per 100 | Value B. F. at 25c lb. | W. P. |               |
|---------------|---------|------------|-------------|-----------|------------------------------|------------------------|-------|---------------|
|               |         |            |             |           |                              |                        | Age   | Breed         |
| Best cow....  | 1       | 7445.1     | 4.82        | 358.59    | \$85.62                      | \$89.65                | 6     | Jersey        |
| Poorest cow   | 3       | 4091.2     | 3.83        | 156.71    | \$47.05                      | 39.18                  | 8     | Gr. Shorthorn |
| Av. of herd.. | ..      | 6219.77    | 3.89        | 242.32    | \$71.52                      | \$60.58                | ..    | ..            |
|               | 1       | 7445.1     | 4.82        | 358.59    | \$85.62                      | \$89.65                | 6     | Jersey        |
|               | 2       | 6306.0     | 3.62        | 228.24    | 72.52                        | 57.06                  | 8     | Gr. Shorthorn |
|               | 3       | 4091.2     | 3.83        | 156.71    | 47.05                        | 39.18                  | 8     | Gr. Shorthorn |
|               | 4       | 5316.7     | 3.98        | 211.76    | 61.44                        | 52.94                  | 7     | Gr. Shorthorn |
|               | 5       | 6593.4     | 3.57        | 235.72    | 75.82                        | 58.93                  | 12    | Gr. Holstein  |
|               | 6       | 6143.6     | 4.36        | 268.22    | 70.65                        | 67.05                  | 8     | Gr. Shorthorn |
|               | 9       | 7913.0     | 3.49        | 276.13    | 91.00                        | 69.03                  | 9     | Gr. Holstein  |
|               | 10      | 6509.7     | 3.07        | 242.3     | 74.86                        | 60.80                  | 7     | Gr. Shorthorn |
|               | 11      | 8875.0     | 3.44        | 305.72    | 102.07                       | 76.43                  | 12    | Gr. Holstein  |
|               | 12      | 4065.1     | 4.87        | 198.10    | 46.74                        | 49.50                  | 5     | Jer. and Hol. |
|               | 15      | 5158.8     | 3.55        | 183.06    | 59.33                        | 45.76                  | 8     | Gr. Holstein. |
|               | ..      | 68417.51   | ..          | 2665.55   | \$786.08                     | \$666.33               | ..    | ..            |

The best cow in the herd produced 3353.9 pounds more milk and 201.88 pounds more butter fat than the poorest one. The total butter fat production of the best cow was 228 times as much as that of the poorest cow. Table six in preparing the weekly production of cows 1, 7, 8, and 13, shows clearly the great difference in persistency in them. Although 7 and 8 calved in July, they should have been giving more than 15 pounds of milk per

day on December 28th, yet this is approximately what No. 7 was doing at that time, while No. 8 was yielding still less. No. 13 freshened two months later than No. 1, and during the week ending December 28th, produced only 131.3 pounds of milk containing 5.51 pounds of butter fat. More than that,, notice how rapidly she decreased in amount of milk in the successive tests, while No. 1 maintained her production. Both cows were of the same age and notwithstanding the advantage of having freshened two months later than No. 1, cow No. 13 fell off 42.7 per cent in milk and 40.2 per cent in butter fat production, and during the same time No. 1 shrank only 13.4 per cent in milk and 3 per cent in quantity of butter fat. Differences of this kind show very clearly the importance attached to the weeding-out process. If the owner of this herd had been careful to use a pure-bred dairy sire continuously and had exercised the requisite amount of care in weeding out his low producing individuals, he would have been in possession of a highly profitable herd.

## Herd No. 4.

## W. P.

Table 6. Shows the Weekly Production of No. 1 in Comparison with that of Three Other Cows which were Removed Because of Inefficiency.

| No. cow | Month fresh | Test week ending | Pounds milk | Pece fat | Pounds butter fat | Age | Breed        |
|---------|-------------|------------------|-------------|----------|-------------------|-----|--------------|
| 1       | September   | Dec. 28          | 158.2       | 5.0      | 7.91              | 6   | Jersey       |
| 1       | Septemb r   | Feb. 28          | 133.3       | 5.1      | 6.79              | 6   | Jersey       |
| 1       | September   | May 1            | 137.0       | 5.6      | 7.67              | 6   | Jersey       |
| 7       | July        | Dec. 28          | 100.2       | 3.9      | 3.90              | 9   | Gr. Shorth'n |
| 7       | July        | Feb. 28          | 57.1        | 3.7      | 2.11              | 9   | Gr. Shorth'n |
| 8       | July        | Dec. 28          | 93.4        | 4.9      | 4.57              | 8   | Gr. Hareford |
| 8       | July        | Feb. 28          | 75.8        | 4.6      | 3.48              | 8   | Gr. Hareford |
| 13      | November    | Dec. 28          | 131.3       | 4.2      | 5.51              | 6   | Gr. Shorth'n |
| 13      | November    | Feb. 28          | 101.3       | 4.2      | 4.25              | 6   | Gr. Shorth'n |
| 13      | November    | May 1            | 75.1        | 4.4      | 3.30              | 6   | Gr. Shorth'n |

## Herd No. 6.

## G. W.

This is one of the best herds of registered and grade dairy cattle in Southern Illinois. The high average production of 285.21 pounds of butter fat per year for the herd indicates the large productive capacity of the cows. This herd shows very nicely the excellent results obtained through improvement by the



use of a pure-bred sire. For several years the owner has persistently used a dairy bull of good breeding and approved form, and as a result his herd now contains an attractive lot of uniformly highly productive young cows. The table shows that the best cow produced 399.47 pounds of butter fat per year, while the poorest record was that of a two-year-old heifer that yielded 211.8 pounds of butter fat which is no discredit to a cow of that age. One of the important facts that has contributed to the successful results in this herd is the care exercise in removing unprofitable cows. Although located at a considerable distance from the factory to which his milk is delivered, over bad roads most of the year, the owner has found dairying profitable. He early realized that he could not hope for success without cows of great

Table 7. Herd No. 6.

G. W.

| No.          | Total milk.   | Percent fat | Total fat | Av. milk per day | Av. fat per day. | Value milk at \$1.15 per 100 | Value B. F. at 25c. lb. | Age.      | Breed        |              |
|--------------|---------------|-------------|-----------|------------------|------------------|------------------------------|-------------------------|-----------|--------------|--------------|
| Best cow,... | 2 9067.0      | 4.41        | 99.47     | 28.33            | 1.248            | \$104.27                     | \$99.87                 | 7         | Gr. Shorth'n |              |
| Poorest cow  | 16 5796.5     | 3.65        | 211.80    | 20.12            | .735             | 66.65                        | 52.95                   | 2         | Gr. Holstein |              |
| Av. of herd. | ..... 7879.19 | 3.62        | 285.21    | 25.78            | .934             | \$90.54                      | \$71.30                 | ....      |              |              |
| No. cow.     | Days it milk. |             |           |                  |                  |                              |                         |           |              |              |
| 1            | 204           | 4380.6      | 5.10      | 224.53           | 21.47            | 1.100                        | \$50.38                 | \$56.13   | 7            | Gr. Holstein |
| 2            | 329           | 9067.0      | 4.41      | 399.47           | 28.53            | 1.248                        | 104.27                  | 99.87     | 7            | Gr. Shorth'n |
| 3            | 326           | 6521.1      | 3.57      | 219.77           | 20.00            | .674                         | 75.09                   | 54.94     | 4            | Gr. Holstein |
| 4            | 296           | 6683.0      | 4.29      | 236.63           | 22.57            | .968                         | 76.85                   | 71.65     | 4            | Gr. Holstein |
| 5            | 358           | 9308.7      | 3.01      | 298.55           | 27.67            | .833                         | 113.95                  | 74.64     | 4            | Gr. Holstein |
| 6            | 275           | 7302.4      | 2.65      | 275.23           | 26.55            | 1.000                        | 83.98                   | 68.81     | 5            | Gr. Holstein |
| 7            | 287           | 8536.5      | 3.62      | 308.81           | 29.74            | 1.076                        | 98.17                   | 77.20     | 4            | Gr. Holstein |
| 8            | 282           | 6801.3      | 3.89      | 264.24           | 24.11            | .937                         | 78.21                   | 66.06     | 5            | Gr. Shorth'n |
| 9            | 288           | 6223.0      | 4.14      | 257.58           | 21.60            | .894                         | 71.56                   | 64.39     | 7            | Gr. Holstein |
| 10           | 320           | 9725.7      | 3.85      | 374.77           | 30.39            | 1.171                        | 111.85                  | 93.69     | 8            | Pure Holst'n |
| 11           | 308           | 5453.4      | 4.41      | 240.40           | 17.70            | .780                         | 62.71                   | 60.10     | 2            | Reg. Holst'n |
| 12           | 345           | 10125.4     | 3.22      | 324.23           | 29.54            | .939                         | 116.44                  | 81.06     | 4            | Gr. Holstein |
| 13           | 233           | 7133.8      | 3.81      | 271.81           | 30.61            | 1.166                        | 84.33                   | 67.95     | 4            | Gr. Holstein |
| 14           | 333           | 9028.5      | 3.75      | 338.44           | 27.11            | 1.016                        | 103.82                  | 84.61     | 4            | Gr. Holstein |
| 15           | 295           | 7005.0      | 3.55      | 247.47           | 23.74            | .842                         | 87.56                   | 62.11     | 2            | Gr. Holstein |
| 16           | 288           | 5796.4      | 3.65      | 211.80           | 20.12            | .735                         | 66.65                   | 52.95     | 2            | Gr. Holstein |
| 17           | 365           | 10670.2     | 2.80      | 297.64           | 29.23            | .815                         | 122.70                  | 74.41     | 9            | Reg. Holst'n |
| 18           | 309           | 9171.3      | 3.10      | 285.62           | 29.68            | .936                         | 105.46                  | 71.00     | 5            | Reg. Holst'n |
| 19           | 330           | 9594.1      | 2.80      | 274.63           | 27.07            | .832                         | 119.92                  | 68.65     | 5            | Reg. Holst'n |
| 20           | 344           | 8436.5      | 3.57      | 301.50           | 24.52            | .876                         | 97.01                   | 75.39     | 5            | Reg. Holst'n |
| ...          | ....          | 157463.9    | ....      | 5704.22          | .....            | .....                        | \$1830.91               | \$1427.00 | ....         |              |

efficiency, so he set about to obtain them by the only rational

means possible. His example can be followed by others with assurance of equal success if they only persist in their efforts.

In general the cows were persistent milkers as shown by their long lactation periods. It is encouraging to note that some of them have records exceeding 10,000 pounds of milk per year and over 300 pounds of butter fat. With cows of this kind, the profitable side of dairying is easily seen. In connection with the production of this herd it is well to note the feeding and management, for these have contributed largely to the high returns. Large crops of corn, cowpeas and clover are grown upon this farm and consumed by the dairy herd, the manure being carefully returned to the fields, which practice in years past has brought up the land to a condition in which excellent yields of corn and clover are assured. At first, the sowing of clover seed was unsuccessful in securing a stand, but by the use of leguminous crops and the careful application of farm manures, the physical and chemical condition of soil have been sufficiently improved to make the growing of clover fairly successful. A large acreage of cowpeas is annually provided for, and their importance cannot be overestimated. The sowing of millet with cowpeas is practiced as the presence of the millet assists in curing the cowpeas, a process which is often attained with some difficulty as the making of this hay comes at a season when the weather is often unfavorable. Cowpea is worth the effort involved as it furnishes excellent winter roughage, even though one fails to get it in the best condition.

The herd did not receive silage, the high production during the winter being stimulated by feeding a liberal grain ration in connection with cowpea hay. During winter, the herd received from 4 to 6 pounds of wheat bran, 10 pounds of corn and cob meal together with 15 pounds of cowpea hay and what they would eat of corn stover. The corn and cob meal was ground on the farm which also tended to reduce expenses. In summer, the herd had access to excellent pasture which was supplemented by 4 to 5 pounds of bran per cow. All the foods consumed by

this herd other than bran, were grown upon the farm. This is a condition toward which all milk producers should strive, for the profits are in direct proportion to the extent to which the farm provides the herd with a well balanced ration. The records of the individual cows should be studied carefully and the production of the herd considered as a market for the crops of the farm.

#### Herd No. 7.

Perhaps no herd reported in this Circular shows the great advantage to be derived from testing better than does this one. At the time of testing it was made up of grade Shorthorns and common stock, the production of which, as shown by the table, averaged very low. The owner was induced to test his herd only after considerable persuasion and the taking of samples and weighing became so arduous that the work was discontinued at the end of the year. The herd contained several cows that were very poor and but one, namely No. 8, was decidedly profitable. The cows were fairly well fed at all times, so that the low production is not to be attributed more to lack of ability on the part of the cows than to the management, though the latter could

Table 8. Herd No. 7.

|                 |          |             |              |            |                  |                  | F. E.              |                 |
|-----------------|----------|-------------|--------------|------------|------------------|------------------|--------------------|-----------------|
|                 |          |             |              |            |                  |                  | Value milk Value   |                 |
| No.             |          | Total milk. | Percent fat. | Total fat. | Av. milk per day | Av. fat per day. | at \$1.15 per 100. | B. F at 25c lb. |
| Best cow . . .  | 8        | 5506.8      | 4.70         | 264.01     | 19.88            | .953             | \$63.34            | \$71.00         |
| Poorest cow     | 2        | 3412.1      | 3.78         | 128.96     | 12.73            | .481             | 39.24              | 32.24           |
| Av. of herd . . |          | 4524.75     | 3.76         | 170.49     | 16.83            | .634             | \$52.03            | \$42.62         |
| No.             | Days     |             |              |            |                  |                  |                    |                 |
| cow.            | in milk. |             |              |            |                  |                  |                    |                 |
| 1               | 243      | 5082.4      | 3.61         | 183.7      | 20.91            | .756             | \$58.45            | \$45.90         |
| 2               | 268      | 3412.1      | 3.78         | 128.96     | 12.73            | .481             | 39.24              | 32.24           |
| 3               | 232      | 4114.5      | 3.72         | 148.61     | 17.73            | .640             | 47.32              | 37.15           |
| 4               | 330      | 4417.0      | 4.29         | 189.83     | 13.38            | .575             | 50.80              | 47.45           |
| 5               | 282      | 4131.8      | 3.76         | 155.51     | 14.65            | .551             | 47.52              | 38.88           |
| 6               | 311      | 4397.2      | 3.77         | 165.97     | 14.14            | .533             | 50.57              | 41.49           |
| 7               | 274      | 4190.8      | 3.25         | 136.58     | 15.32            | .498             | 48.19              | 34.14           |
| 8               | 277      | 5506.8      | 4.77         | 264.01     | 19.88            | .953             | 63.34              | 71.00           |
| 9               | 212      | 4842.7      | 2.89         | 140.21     | 22.84            | .661             | 55.69              | 35.05           |
| 10              | 250      | 5152.2      | 3.71         | 191.58     | 19.89            | .739             | 59.25              | 47.90           |
|                 |          | 45247.5     |              | 1704.96    |                  |                  | \$520.37           | \$431.20        |

have been somewhat improved. In winter the ration was composed of 3 to 5 pounds of bran, 5 to 7 of corn and cob meal, together with corn stover and a small allowance of cowpeas. The cows were about medium size but not the deep-bodied kind that are capable of storing away large quantities of coarse food which they convert cheaply into milk. In summer millet was supplied to sustain the herd when pastures became short, the cows in milk receiving in addition 5 pounds of bran and 5 pounds of corn and cob meal. The stable, which was roomy, was provided with a good floor and was comfortable, though light and ventilation had been overlooked. All things considered, the herd was fairly well cared for, yet as a whole, made a poor return. It occasionally happens that a herd of good cows makes a poor return because they are not given an opportunity to respond in proportion to their ability, from the fact that they are either under fed or maltreated. The low production here cannot be explained in that way.

A glance at the table shows that the best cow, No. 8 yielded only 264.01 pounds of butter fat per year, while the poorest, No. 2, produced but 128.96 pounds. An average production of 170.49 pounds of butter fat is obviously approaching very closely the lowest point of profitable production. Here then was a man who was keeping his herd with scarcely any profit, if we estimate the cost of food at prevailing commercial prices. However, these cows were maintained quite largely on farm-grown foods, and the owner probably realized a small profit as shown in the following table. From the fact that the cows were all retained for a year, we have some interesting records, yet the retention of some of the cows incurred a loss to the owner.

In table 9 is given the production of each cow and its value at 25 cents per pound for butter fat. A record was kept of the approximate amounts and values of the foods consumed by this herd, from which it is found that the average cost of food was about \$35.00 per cow per year. On this basis, the first part of table 9 shows that two cows were kept at a loss while three others

|   |              | Herd No. 7.  |            |                        | F. E.      |         |
|---|--------------|--------------|------------|------------------------|------------|---------|
| Table 9. Shows Profit Per Cow When the Average Cost for Food Is \$35.00 Per Year. |              |              |            |                        |            |         |
| No. of cow.   | Pounds milk. | Percent fat. | Total fat. | Value B. F. at 25c lb. | Cost food. | Profit  |
| 1   | 5082.4       | 3.61         | 183.70     | \$45.90                | \$35.00    | \$10.90 |
| 2   | 3412.1       | 3.78         | 128.96     | 32.24                  | 35.00      | —2.76   |
| 3   | 4114.5       | 3.72         | 148.61     | 37.15                  | 35.00      | 2.15    |
| 4   | 4417.0       | 4.29         | 189.83     | 47.45                  | 35.00      | 12.45   |
| 5   | 4131.8       | 3.76         | 155.51     | 38.88                  | 35.00      | 3.88    |
| 6   | 4397.2       | 3.77         | 165.97     | 41.49                  | 35.00      | 6.49    |
| 7   | 4190.8       | 3.25         | 136.58     | 34.14                  | 35.00      | — .86   |
| 8   | 5506.8       | 4.77         | 264.01     | 71.00                  | 35.00      | 36.00   |
| 9   | 4842.7       | 2.89         | 140.21     | 35.05                  | 35.00      | .05     |
| 10  | 5152.2       | 3.71         | 191.58     | 47.90                  | 35.00      | 12.90   |
|   |              |              |            | \$431.20               | \$350.00   | \$81.20 |

Average profit per cow \$8.12.

Omitting No. 8, average profit per cow \$5.02.

| Fewer Cows—More Money. |              |              |            |                        |            |         |
|------------------------|--------------|--------------|------------|------------------------|------------|---------|
| No. of cow.            | Pounds milk. | Percent fat. | Total fat. | Value B. F. at 25c lb. | Cost food. | Profit  |
| 1                      | 5082.4       | 3.61         | 183.70     | 45.90                  | \$35.00    | \$10.90 |
| 4                      | 4417.0       | 4.29         | 189.83     | 47.45                  | 35.00      | 12.45   |
| 6                      | 4397.2       | 3.77         | 165.97     | 41.49                  | 35.00      | 6.49    |
| 8                      | 5506.8       | 4.77         | 264.01     | 71.00                  | 35.00      | 36.00   |
| 10                     | 5152.2       | 3.71         | 191.58     | 47.90                  | 35.00      | 12.90   |
|                        |              |              |            | \$253.74               | \$175.00   | \$78.74 |

Average profit per cow \$15.74. Gain \$7.62.

#### Herd No. 8.

W. W.

gave little or no profit. The value of butter fat from the ten cows amounted to \$431.20; the cost of food equalled \$350.00, leaving a profit of \$81.20 on ten cows or \$8.12 per cow. If the best cow, No. 8, is excluded, the average profit per cow on the remaining nine is \$5.02. If they had all been so profitable as No. 8 the net return from ten cows would have been \$360.00.

If the five poorest cows had been disposed of and only Nos. 1, 4, 6, 8 and 10, had been retained, the return with these five would have been \$253.74, the cost of food \$175.00, leaving a net profit of \$78.74, a sum nearly as large as that realized by keeping the whole herd. If this latter plan had been followed, the return per cow would have been \$15.74, which is \$7.62 more per cow than was obtained when the whole herd was kept. The



reader will observe the great contrast between this herd and herd No. 6. It affords some satisfaction to know that a pure-bred dairy sire is being used to bring about an improvement in this herd.

**Herd No. 8.**

**W. W.**

As shown by the accompanying record, this herd was also of decidedly low grade. It was made up of "scrub" cows picked up in a locality where dairying was in its inception, and included some that were shipped in from other dairy communities. The owner was not well trained in the art of cow-handling, yet he studied hard and has made some progress by weeding out poor cows and correcting his judgement in feeding. During summer the herd was provided fair pasture with a small amount of bran. In winter they received 6 pounds of bran, 4 pounds of corn and cob meal, and one pound of oil meal for concentrates, and hay of mixed grasses, clover, and corn stover for roughness. Although the cows were inferior, the owner probably marketed his crops at a slight profit by feeding them to these cows for the price of milk was rather high. However, it is easy to see what a loss he might have avoided had all his cows been as good as the best one. The low production of the herd in general was caused, to a large extent, by the ravages of contagious abortion. Nearly all the cows calved prematurely which necessarily interfered more or less with their lactation. The year's record given here includes part of the lactation period previous to the infection.

Table 10. Herd No. 8.

|                |          | W. W.    |         |         |          | Value milk Value |           |          |
|----------------|----------|----------|---------|---------|----------|------------------|-----------|----------|
|                |          | Total    | Percent | Total   | Av. milk | Av. fat.         | at \$1.15 | B. F. at |
|                |          | milk.    | fat.    | fat.    | per day  | per day.         | per 100.  | 25c lb.  |
| Best cow . . . | 5        | 6647.0   | 3.09    | 263.42  | 18.21    | .721             | \$76.20   | \$65.85  |
| Poorest cow    | 7        | 2690.8   | 3.61    | 97.17   | 15.92    | .575             | 29.94     | 24.29    |
| Av. of herd    |          | 4485.7   | 4.29    | 192.51  | 15.30    | .655             | \$51.58   | \$48.12  |
| No.            | Days     |          |         |         |          |                  |           |          |
| cow.           | in milk. |          |         |         |          |                  |           |          |
| 1              | 236      | 3565.2   | 4.56    | 165.9   | 15.10    | .703             | \$41.00   | \$41.50  |
| 2              | 280      | 5447.0   | 3.79    | 206.31  | 19.45    | .737             | 62.64     | 51.58    |
| 3              | 196      | 4100.9   | 4.52    | 185.75  | 20.92    | .947             | 47.16     | 46.43    |
| 4              | 321      | 4681.4   | 4.97    | 232.67  | 14.58    | .724             | 53.84     | 58.17    |
| 5              | 365      | 6647.0   | 3.09    | 263.42  | 18.21    | .721             | 76.20     | 65.85    |
| 7              | 169      | 2690.8   | 3.61    | 97.17   | 15.92    | .575             | 29.04     | 24.29    |
| 8              | 365      | 4588.9   | 4.65    | 206.56  | 12.57    | .566             | 52.77     | 51.64    |
| 9              | 365      | 5482.2   | 4.04    | 222.95  | 15.02    | .610             | 63.10     | 55.74    |
| 11             | 325      | 3773.5   | 5.57    | 189.28  | 11.61    | .582             | 43.39     | 47.32    |
| 12             | 314      | 3959.8   | 3.92    | 155.18  | 12.61    | .494             | 45.54     | 38.79    |
|                |          | 44,929.7 |         | 1924.19 |          |                  | \$515.58  | \$481.31 |

The best cow yielded 263.42 pounds of butter fat while the poorest produced only 97.17 pounds of butter fat in the year. The average return from the whole herd was low, being only 192.51 pounds of butter fat. The annual production of 4500 pounds of milk is not very encouraging, yet with proper management cows of this class can be used as stock upon which to build a better herd. The feeding of more grain in summer and the use of more leguminous roughness as cowpea hay in winter would have given better results. The capacity of the cows, however, would not warrant too liberal a ration.

## Herd No. 10.

J. F.

At the beginning of the test this herd was made up of eighteen cows of mixed breeding, some of which proved to be creditable animals. The owner was fairly successful in selecting cows, and by feeding them carefully he was able to realize, on the whole, a respectable profit from the consumption of his course foods. He had no silo, but preserved his roughness in good condition for feeding, exercising care in handling his manure. In

addition to pasture, the cows received in summer 3 to 5 pounds of bran per day. During the winter months they were given 3 pounds of bran, 5 pounds of corn and cob meal and a small allowance of sucrene dairy feed for a short time. The health of the herd was unimpaired and save the removal of a few cows because of inefficiency the record of the herd is very complete.

The best cow produced 7291.0 pounds of milk, containing 314.96 pounds of butter fat, while the poorest one yielded 3846.7 pounds of milk, containing 168.48 pounds of butter fat. A pure-bred dairy sire has been placed in the herd so that we may expect much better results in the future. A liberal use of cowpea and clover hay would have added very much to the efficiency of the ration. Silage was not fed because the milk was used by a condensory.

Table 11. Herd No. 10.

|              |          |          |         |         |          | J. F.      |          |          |
|--------------|----------|----------|---------|---------|----------|------------|----------|----------|
|              |          |          |         |         |          | Value milk | Value    |          |
|              |          |          |         |         |          | at \$1.15  | B. F. at |          |
| No.          | Day      | Total    | Percent | Total   | Av. milk | Av. fat    | per 100. | 25c lb.  |
|              | in milk. | milk.    | fat.    | fat.    | per day. | per day.   | per 100. |          |
| Best cow..   | 13       | 7291.0   | 4.31    | 314.96  | 21.69    | .937       | \$83.84  | \$78.74  |
| Poorest cow  | 3        | 3846.7   | 4.38    | 168.48  | 21.48    | .941       | 44.23    | 42.12    |
| Av. of herd  |          | 5430.86  | 4.18    | 227.31  | 17.86    | .747       | \$62.45  | \$56.30  |
| No.          | Day      |          |         |         |          |            |          |          |
| cow in milk. |          |          |         |         |          |            |          |          |
| 1            | 271      | 6047.3   | 4.46    | 269.45  | 22.31    | .994       | \$69.54  | \$67.36  |
| 2            | 359      | 5168.1   | 3.96    | 204.59  | 14.39    | .569       | 59.43    | 51.15    |
| 3            | 179      | 3846.7   | 4.38    | 168.48  | 21.48    | .941       | 44.23    | 42.12    |
| 4            | 346      | 5972.9   | 3.68    | 219.71  | 17.26    | .635       | 68.68    | 54.93    |
| 5            | 316      | 5778.7   | 3.86    | 222.86  | 18.28    | .705       | 66.45    | 55.71    |
| 7            | 316      | 4901.3   | 4.06    | 198.93  | 15.51    | .629       | 56.36    | 49.74    |
| 9            | 316      | 4183.0   | 4.76    | 200.40  | 13.23    | .634       | 48.10    | 50.10    |
| 11           | 359      | 4963.1   | 4.60    | 228.35  | 13.82    | .636       | 57.07    | 57.08    |
| 13           | 336      | 7291.0   | 4.31    | 314.96  | 21.69    | .937       | 83.84    | 78.74    |
| 14           | 336      | 5462.9   | 4.21    | 231.3   | 16.25    | .688       | 62.82    | 57.82    |
| 15           | 232      | 5080.6   | 4.25    | 215.86  | 21.89    | .930       | 58.42    | 53.96    |
| 16           | 296      | 6981.8   | 3.44    | 240.34  | 23.58    | .812       | 80.29    | 60.08    |
| 18           | 296      | 4923.7   | 4.32    | 212.91  | 16.63    | .719       | 56.62    | 53.22    |
|              |          | 70,601.1 |         | 2955.14 |          |            | \$811.85 | \$732.01 |

Herd No. 11

F. G. A.

In this herd, nine registered and grade Holsteins have completed a year's record. At the outset it will be well to bear in mind that the six registered cows were each only two year's of

age and with but one exception produced over 200 pounds of butter fat their first year. This is not high production, but considering the size and development of the heifers, together with their food and care it is fairly satisfactory. In butter fat production the registered heifers exceeded the aged grade cows considerably. The herd was provided with a comfortable, well lighted stable, and in winter the ration of the cows in milk was made up of about 20 pounds of silage, 10 pounds corn fodder, 4 pounds bran, 5 pounds of corn and cob meal and one-half pound oil meal. Considering the age of the cows and the food available, the ration, was fairly adapted to the herd. In summer, they received for the concentrated part of their ration, about six pounds of bran, one pound oil meal, one pound cotton seed meal and for roughness eat hay part of the time to supplement the pasture. The pasture was rather poor, which accounts for comparatively liberal feeding of grain in summer. The owner found it profitable to sustain the milk flow in this way as he had ready market for it. This practice is something that should be more generally followed

Table 12. Herd No. 11.

|                           | No. | Total milk<br>fat. | Percent<br>fat. | Total fat. | Av. milk<br>per day. | Av. fat<br>per day. | Value milk<br>at \$1.15<br>per 100. | Value B. F.<br>at 25c lb. | Age. | F. G. A.<br>Breed. |
|---------------------------|-----|--------------------|-----------------|------------|----------------------|---------------------|-------------------------------------|---------------------------|------|--------------------|
| Best cow . . .            | 6   | 6531.0             | 3.78            | 246.70     | 17.89                | .677                | \$75.10                             | \$61.67                   | 2    | Reg. Holstein      |
| Poorest cow               | 5   | 5551.6             | 3.01            | 167.56     | 17.73                | .535                | 63.84                               | 41.89                     | 2    | Reg. Holstein      |
| Av. of herd               |     | 5969.44            | 3.43            | 205.02     | 18.30                | .628                | \$68.64                             | \$51.25                   |      |                    |
| No. Days<br>cow. in milk. |     |                    |                 |            |                      |                     |                                     |                           |      |                    |
| 1                         | 332 | 6042.0             | 3.46            | 209.23     | 18.19                | .630                | \$69.48                             | \$52.30                   | 2    | Reg. Holstein      |
| 2                         | 343 | 6654.9             | 3.37            | 224.60     | 19.40                | .654                | 76.53                               | 56.15                     | 2    | Reg. Holstein      |
| 3                         | 344 | 5767.7             | 3.67            | 212.00     | 16.76                | .616                | 66.32                               | 53.02                     | 2    | Reg. Holstein      |
| 4                         | 365 | 6692.9             | 3.42            | 229.05     | 18.33                | .627                | 76.96                               | 57.26                     | 2    | Reg. Holstein      |
| 5                         | 313 | 5551.6             | 3.01            | 167.56     | 17.73                | .535                | 63.84                               | 41.89                     | 2    | Reg. Holstein      |
| 6                         | 365 | 6531.0             | 3.78            | 246.70     | 17.89                | .677                | 75.10                               | 61.67                     | 2    | Reg. Holstein      |
| 7                         | 309 | 5528.0             | 3.68            | 203.46     | 17.89                | .658                | 63.57                               | 50.86                     | 7    | Gr. Durham         |
| 8                         | 269 | 4963.3             | 3.51            | 174.41     | 18.45                | .648                | 57.07                               | 43.60                     | 8    | Gr. Holstein       |
| 9                         | 295 | 5993.7             | 2.79            | 178.08     | 20.31                | .603                | 68.92                               | 44.52                     | 8    | Gr. Holstein       |
|                           |     | 53,725.1           |                 | 1845.18    |                      |                     | \$617.79                            | \$461.27                  |      |                    |

for when pastures become short and the flies and heat oppressive, the production falls rapidly and cannot be entirely regained until the succeeding lactation. Farm-grown foods, however, should be used for this purpose instead of expensive grains. Cows Nos. 8 and 9 are of low capacity and will be replaced by better bred females of greater productive ability. In this herd it is not considered a laborious task to weigh all the milk from each cow and test composite samples at stated intervals. In fact, the owner was weighing milk before this test was started and now he is the more thoroughly convinced of its importance. A pure-bred sire of excellent breeding, is being kept and an effort made to produce dairy cows capable of making the greatest return for the food consumed. Here again, more leguminous hay grown upon the farm should have been available to replace some of the concentrates fed in winter and those given in summer to supplement poor pasture.

**Herd No. 12.****J. H. P.**

The thing that strikes one most forcibly in this herd is its low average production. This can be accounted for quite readily from the fact it was made up of grade Jerseys, grade Holsteins and natives of poor quality, several of which had long since seen the day of their highest production. The owner seemed to be careful about his general farm management, but persisted in use of a grade "beef" bull. His excuse lay in the fact that the milk was sold for direct consumption and the calves could be most readily sold for veal when bred in this manner. This herd was provided comfortable quarters, but the ration was not properly adapted to its needs. In winter the milking cows were given 8 to 10 pounds of corn and cob meal for concentrate and about



|              |          | Table 13. Herd No. 12. |         |         |          | J. H. P. |             |          |
|--------------|----------|------------------------|---------|---------|----------|----------|-------------|----------|
|              |          | Total                  | Percent | Total   | Av. milk | Av. fat  | Value milk. | Value    |
| No.          | Days     | milk.                  | fat.    | fat.    | per day  | per day. | at \$1.15   | B.F. at  |
|              |          |                        |         |         |          |          | per 100.    | 25c lb.  |
| Best cow . . | 12       | 6429.4                 | 3.80    | 248.36  | 23.63    | .913     | \$73.93     | \$62.09  |
| Poorest cow  | 7        | 2090.4                 | 4.83    | 101.05  | 10.61    | .512     | 24.03       | 25.26    |
| Av. of herd  |          | 4503.65                | 3.89    | 175.41  | 16.91    | .658     | \$51.79     | \$43.85  |
| No.          | Days     |                        |         |         |          |          |             |          |
| cows.        | in milk. |                        |         |         |          |          |             |          |
| 1            | 340      | 4790.2                 | 4.04    | 193.66  | 14.08    | .569     | \$55.08     | \$48.41  |
| 2            | 283      | 5362.9                 | 4.03    | 216.49  | 18.95    | .764     | 61.67       | 54.12    |
| 3            | 253      | 4717.2                 | 4.04    | 190.70  | 18.64    | .753     | 54.24       | 47.67    |
| 4            | 308      | 4648.5                 | 4.14    | 192.61  | 15.92    | .625     | 53.45       | 48.15    |
| 5            | 326      | 5408.1                 | 3.83    | 207.53  | 16.58    | .636     | 62.19       | 52.38    |
| 6            | 257      | 3205.2                 | 4.11    | 131.77  | 12.47    | .512     | 36.85       | 32.94    |
| 7            | 197      | 2090.4                 | 4.83    | 101.05  | 10.61    | .512     | 24.03       | 25.26    |
| 8            | 248      | 4614.9                 | 3.64    | 168.25  | 18.60    | .678     | 53.07       | 42.06    |
| 9            | 240      | 3264.7                 | 3.64    | 118.88  | 13.60    | .495     | 37.54       | 29.72    |
| 10           | 278      | 4898.6                 | 3.53    | 173.38  | 17.62    | .623     | 56.33       | 43.34    |
| 11           | 256      | 5438.5                 | 3.40    | 189.85  | 21.24    | .741     | 62.54       | 47.46    |
| 12           | 272      | 6429.4                 | 3.80    | 248.36  | 23.63    | .913     | 73.93       | 62.09    |
| 13           | 203      | 3678.9                 | 4.01    | 147.84  | 18.12    | .728     | 42.30       | 36.96    |
|              |          | 58,547.5               |         | 2280.37 |          |          | \$673.12    | \$570.56 |

five pounds each of corn stover and clover hay for roughness. Better results would have been obtained if the ration had been composed of five pounds bran, eight pounds corn and cob meal, ten pounds clover hay and what corn stover they would readily consume. During the summer months, the herd was maintained upon pasture exclusively, except during the early part of the season, when a small amount of bran and corn and cob meal was given. Little need be said about the records of the different cows. From the description already given and a careful study of the table, it is easy to see the difficulties in the way of producing milk and butter fat cheaply with cows of the kind indicated. With the present trend of breeding there is no immediate prospect of a rapid improvement of the herd.

## Herd No. 15.

C. J. W.

This herd was owned by a progressive farmer who made milk production an incident rather than the main part of his

farming operations. He appreciated the call of the local pasteurizing plant for milk, and in the absence of well bred dairy cows was forced to use such as were available. Most of them were grade Shorthorns, lacking in dairy form. The best cow produced 298.57 pounds of butter fat, while the poorest record was only 135.29 pounds. Of the thirteen cows in the original herd six produced from 204 to 298 pounds of butter fat while six others yielded from 135 to 197 pounds butter fat in the year. The average production of the herd was low, yet because of the cheapness of the food it doubtless proved profitable to the owner. This is an illustration of the futility of trying to obtain liberal milk or butter fat production from cows disposed to use their food for other purposes. They were, in the general acceptance of the term, dual purpose cows. The very nature of their breeding prevented them from converting the rations into dairy products as economically as might well have been desired. It should be said that the owner did not approve of using such animals for dairy purposes, but at the time he was unable to do better. The dual purpose enthusiast if he will compare these cows with many of those found in the herds 3, 6, or 24, may perhaps see why it is that the special purpose dairy cow is essential to the best interests of a dairyman.

A serious mistake was made by the owner in using a grade Shorthorn bull closely related to several members of the herd. This was done in order that the calves might be better for veal, a practice which incurred a great loss if the owner intends to follow the business. By the continued use of a pure-bred dairy sire in a herd of this kind it is possible to produce animals of high ability. Obviously this opportunity was overlooked .

| Table 14. Herd No. 15. |               |              |            |                   |                  |                               |                        |          |        | C. J. W.      |  |
|------------------------|---------------|--------------|------------|-------------------|------------------|-------------------------------|------------------------|----------|--------|---------------|--|
| No.                    | Total milk.   | Percent fat. | Total fat. | Av. milk per day. | Av. fat per day. | Value milk at \$1.15 per 100. | Value B. F. at 25c lb. | Age.     | Breed. |               |  |
| Best cow . . .         | 3             | 6289.0       | 4.74       | 298.57            | 18.82            | .893                          | \$72.32                | \$74.64  | 5      | Gr. Shorthorn |  |
| Prest cow . .          | 12            | 3491.1       | 3.01       | 135.29            | 11.83            | .458                          | 40.44                  | 33.82    | 2      | Gr. Shorthorn |  |
| Av. of herd            |               | 5127.8       | 4.03       | 206.78            | 17.51            | .706                          | \$58.96                | \$51.69  |        |               |  |
| No. cow.               | Days in milk. |              |            |                   |                  |                               |                        |          |        |               |  |
| 1                      | 246           | 4518.0       | 4.28       | 193.23            | 18.34            | .785                          | \$51.89                | \$48.30  | 4      | Gr. Shorthorn |  |
| 2                      | 294           | 6251.3       | 3.40       | 212.89            | 21.26            | .724                          | 71.88                  | 53.22    | 8      | Gr. Shorthorn |  |
| 3                      | 334           | 6289.0       | 4.74       | 298.57            | 18.82            | .893                          | 72.32                  | 74.64    | 5      | Gr. Shorthorn |  |
| 4                      | 295           | 4646.6       | 3.98       | 185.03            | 15.75            | .627                          | 53.43                  | 46.25    | 4      | Gr. Jersey    |  |
| 6                      | 246           | 4725.5       | 4.33       | 204.77            | 19.61            | .832                          | 54.34                  | 51.19    | 5      | Gr. Shorthorn |  |
| 7                      | 251           | 5399.9       | 3.08       | 207.70            | 21.51            | .826                          | 60.09                  | 51.92    | 3      | Gr. Shorthorn |  |
| 8                      | 344           | 5533.2       | 3.39       | 187.64            | 16.08            | .545                          | 63.63                  | 46.91    | 3      | Gr. Shorthorn |  |
| 9                      | 302           | 4543.5       | 4.20       | 191.38            | 15.04            | .633                          | 52.25                  | 47.84    | 3      | Gr. Shorthorn |  |
| 10                     | 323           | 5075.2       | 4.10       | 208.46            | 15.71            | .645                          | 58.36                  | 52.11    | 3      | Gr. Shorthorn |  |
| 11                     | 274           | 6152.3       | 4.20       | 258.88            | 22.45            | .944                          | 70.75                  | 64.72    | 5      | Gr. Jersey    |  |
| 12                     | 295           | 3491.1       | 3.01       | 135.29            | 11.83            | .458                          | 40.44                  | 33.82    | 2      | Gr. Shorthorn |  |
| 13                     | 300           | 4913.7       | 4.02       | 197.54            | 15.90            | .639                          | 56.50                  | 49.38    | 2      | Gr. Holstein  |  |
|                        |               | 61,534.3     |            | 2481.38           |                  |                               | \$705.88               | \$620.30 |        |               |  |

During the summer months the ration consisted of pasture supplemented by two pounds of corn and cob meal, one pound of bran, and one pound of rye. During winter it was composed of eight pounds of corn and cob meal, five pounds of clover hay and a liberal allowance of corn stover. The farm produced each year a large amount of clover hay which contributed much to the cheapness of the ration. The supplementary feeding in summer was good, but a larger use should have been made of cowpea and clover hay in the winter ration. In this particular case a silo would have been very desirable for no objection would have been made to the use of silage.

## Herd No. 16.

J. C. C.

It will be impossible in the short account of this herd to enumerate all the interesting features connected with the management of the farm and dairy. The farm comprises forty acres

of level (almost too wet) land, which has been brought to a high state of cultivation by the continuous growing of clover and the careful use of the farm manures. The manure from herd is kept under clover and distributed with a spreader at a time when the soil will be least injured by trampling. One of the things about which the owner is very particular is to avoid the handling of the soil at a time when there is danger of injuring its physical condition. The location and nature of his land is such as to make this imperative. His pasture is thick and fine and capable of sustaining a comparatively large number of animals. Corn yields a large crop, oats and wheat are liable to lodge before harvest and sorghum is so growthy that even a moderate wind lays it flat. These facts are mentioned to give evidence of the thought exercised in the farm management so that the latter may be contrasted with the productive capacity of the herd.

The owner had long felt that his cows were not what they should be, but was never thoroughly impressed with that fact until he began to test them. With one exception the nine cows making up his herd were grade Shorthorns, one cow in the herd being a Jersey. Their average production was 4607.5 pounds of milk and 183.52 pounds of butter fat. Such a herd one can see at a glance, is not profitable to keep where milk is commanding a good price, and cream is in demand. The Jersey showed herself to be the best producer of butter fat, yielding 237.64 pounds, while the best Shorthorn produced, however, only 212.60 pounds of butter fat. During the winter months these cows were given

Table 15. Herd No. 16.

J. C. C.

|                | No.           | Total milk. | Percent fat. | Total fat. | Av. milk per day. | Av. fat per day. | Per 100  | Value milk at \$1.15 | Value B. F. at 25c lb. | Age.          | Breed.   |
|----------------|---------------|-------------|--------------|------------|-------------------|------------------|----------|----------------------|------------------------|---------------|----------|
|                |               |             |              |            |                   |                  |          |                      |                        |               | J. C. C. |
| Best cow . . . | 9             | 5292.6      | 4.49         | 237.64     | 14.82             | .665             | \$60.86  | \$59.41              | 5                      | Jersey        |          |
| Poorest cow    | 6             | 3751.5      | 3.99         | 150.01     | 15.31             | .612             | 43.14    | 37.50                | 3                      | Gr. Shorthorn |          |
| Av. of herd    |               | 4607.5      | 3.98         | 183.52     | 14.55             | .641             | \$52.98  | \$45.88              |                        |               |          |
| No. cow.       | Days in milk. |             |              |            |                   |                  |          |                      |                        |               |          |
| 1              | 312           | 4271.9      | 3.67         | 157.11     | 12.49             | .459             | \$49.11  | \$39.27              | 12                     | Gr. Shorth'rn |          |
| 2              | 329           | 3929.2      | 3.56         | 139.93     | 11.94             | .425             | 45.18    | 34.98                | 14                     | Gr. Shorth'rn |          |
| 3              | 296           | 4988.0      | 3.85         | 192.07     | 16.85             | .648             | 57.36    | 48.01                | 12                     | Gr. Shorth'rn |          |
| 4              | 316           | 4153.8      | 3.74         | 155.71     | 13.14             | .492             | 47.76    | 38.92                | 7                      | Gr. Shorth'rn |          |
| 5              | 344           | 5627.5      | 3.56         | 200.56     | 16.35             | .583             | 64.71    | 50.14                | 6                      | Gr. Shorth'rn |          |
| 6              | 245           | 3751.5      | 3.99         | 150.01     | 15.31             | .612             | 43.14    | 37.50                | 3                      | Gr. Shorth'rn |          |
| 7              | 342           | 4215.3      | 4.89         | 206.19     | 12.32             | .602             | 48.47    | 51.54                | 3                      | Gr. Shorth'rn |          |
| 9              | 357           | 5292.6      | 4.49         | 237.64     | 14.82             | .665             | 60.86    | 59.41                | 5                      | Jersey        |          |
| 10             | 292           | 5237.9      | 4.05         | 212.60     | 17.91             | .727             | 60.23    | 53.15                | 14                     | Gr. Shorth'rn |          |
|                |               | 41467.7     |              | 1651.82    |                   |                  | \$476.82 | \$412.92             |                        |               |          |

a ration composed of three pounds of bran, three pounds of corn and cob meal, eight pounds of clover hay, and a part of the time an allowance of oat hay and millet hay. At all times the feeding was liberal, yet the ration was too wide for dairy cows. In summer, the food consisted of good pasture, two pounds of bran per day, and fresh sorghum during August and September. . . . .

After testing for a year, the owner has decided that these cows are too poor from which to rear as good a herd as he desires. He feels that they have such a strong tendency to use their food for flesh production that it will take too long to overcome it by the infusion of dairy blood through the use of a pure-bred dairy sire. His standard he has set at 10,000 pounds of milk in a year containing 350 pounds of butter fat, and he is buying high grade dairy cows with the hope of being able in the course of a few years to reach that level. The outcome of his efforts will be watched with interest for even now his practices are an object lesson to the community. This is not an isolated case for there are



many dairymen laboring under this same difficulty who could see the error of their ways more clearly if they would simply test each cow in the herd. *We need more men who will be guided by the findings of the scales and the Babcock test, and dispose of their poor cows replacing them by animals worthy of the name dairy cows.*

## Herd No. 17.

J. P.

Little need be said concerning this herd as its record indicates very plainly its value. The cows were of poor quality and the management not such as to stimulate them to liberal production. The food was insufficient in some respects and not at all suited to the needs of the herd save during the summer months. This is an illustration of the results so often obtained when dairying is made a side issue instead of being given the attention its importance demands. It is rather surprising that the cows were able to do as well as they did with the attention they received.

| Table 16. Herd No. 17. |             |              |            |                   |                  |                               |                       |                        |              | J. P.          |  |
|------------------------|-------------|--------------|------------|-------------------|------------------|-------------------------------|-----------------------|------------------------|--------------|----------------|--|
| No.                    | Total milk. | Percent fat. | Total fat. | AV. milk per day. | AV. fat per day. | Value milk at \$1.15 per 100. | Value milk at 25c lb. | Value B. F. at 25c lb. | Age.         | Breed.         |  |
| Best cow..             | 7 6114.5    | 3.31         | 202.70     | 22.31             | .739             | \$70.31                       | \$50.67               | 9                      | Gr. Hereford |                |  |
| Poorest cow            | 10 3710.4   | 3.33         | 123.53     | 15.08             | .502             | 42.67                         | 30.88                 | 2                      | Gr. Jersey   |                |  |
| Av. of herd            | 4354.65     | 3.96         | 172.64     | 17.11             | .678             | \$50.08                       | \$43.16               |                        |              |                |  |
| No.                    | Days        |              |            |                   |                  |                               |                       |                        |              |                |  |
| cow.                   | in milk.    |              |            |                   |                  |                               |                       |                        |              |                |  |
| 1                      | 260         | 4088.1       | 4.16       | 170.11            | 15.72            | .654                          | \$47.01               | \$42.52                | 6            | Gr. Jersey     |  |
| 2                      | 199         | 3749.1       | 4.76       | 178.8             | 18.83            | .898                          | 43.11                 | 44.70                  | 9            | Gr. Shorth'r'n |  |
| 3                      | 228         | 4264.0       | 5.10       | 217.56            | 18.70            | .954                          | 49.00                 | 54.39                  | 5            | Gr. Shorth'r'n |  |
| 4                      | 284         | 4626.9       | 3.96       | 183.37            | 16.32            | .645                          | 43.20                 | 45.84                  | 6            | Gr. Jersey     |  |
| 7                      | 274         | 6114.5       | 3.31       | 202.7             | 22.31            | .739                          | 70.31                 | 50.67                  | 9            | Gr. Hereford   |  |
| 9                      | 290         | 3929.6       | 3.36       | 132.46            | 13.55            | .456                          | 45.19                 | 33.12                  | 6            | Gr. Holstein   |  |
| 10                     | 246         | 3710.4       | 3.33       | 123.53            | 15.08            | .502                          | 42.67                 | 30.88                  | 2            | Gr. Jersey     |  |
|                        |             | 30482.6      |            | 1208.53           |                  |                               | \$340.49              | \$302.12               |              |                |  |

## Herd No. 19.

W. J. H.

In many ways, this herd was surrounded with the most favorable conditions of any reported in this Circular. The cows

were kept in a clean, well-lighted stable, a dry yard being provided for exercise. The equipment of the farm is substantial though not elaborate nor beyond the reach of any progressive dairyman. There is a silo attached to the barn and a shed provided at suit-

|             |               | Table 17. Herd No. 19. |            |                   |                  |                               |                        | W.J.H.  |               |
|-------------|---------------|------------------------|------------|-------------------|------------------|-------------------------------|------------------------|---------|---------------|
| No.         | Total milk.   | Percent fat.           | Total fat. | Av. milk per day. | Av. fat per day. | Value milk at \$1.15 per 100. | Value B. F. at 25c lb. | Age.    | Breed.        |
| Best cow..  | 4 6412.7      | 4.57                   | 292.82     | 19.91             | .909             | \$73.75                       | \$73.20                | 8       | Gr. Jersey    |
| Poorest cow | 15 4529.8     | 3.49                   | 158.07     | 14.70             | .513             | 52.09                         | 39.51                  | 9       | Gr. Jersey    |
| Av. of herd |               | 5409.6                 | 4.11       | 242.94            | 16.48            | .730                          | \$62.21                | \$60.73 |               |
| No.         | Days in milk. |                        |            |                   |                  |                               |                        |         |               |
| 1           | 301           | 4941.7                 | 4.69       | 231.76            | 16.41            | .769                          | \$56.83                | \$57.94 | 7 Gr. Jersey. |
| 2           | 282½          | 5616.6                 | 3.64       | 204.11            | 19.88            | .718                          | 64.59                  | 51.02   | 7 Gr. Jersey  |
| 3           | 365           | 5807.3                 | 4.14       | 240.72            | 15.91            | .659                          | 66.78                  | 60.18   | 6 Gr. Jersey  |
| 4           | 322           | 6412.7                 | 4.57       | 292.82            | 19.91            | .909                          | 73.75                  | 73.20   | 8 Gr. Jersey  |
| 5           | 316           | 4798.4                 | 4.01       | 192.34            | 15.18            | .608                          | 55.18                  | 48.08   | 8 Gr. Jersey  |
| 6           | 305½          | 6186.1                 | 4.52       | 279.84            | 20.24            | .916                          | 71.14                  | 69.96   | 8 Gr. Jersey  |
| 7           | 333½          | 5181.4                 | 4.16       | 215.60            | 15.53            | .676                          | 59.59                  | 53.90   | 8 Gr. Jersey  |
| 8           | 329           | 6435.7                 | 4.16       | 267.73            | 19.56            | .813                          | 74.01                  | 66.93   | 8 Gr. Jersey  |
| 9           | 334           | 4836.7                 | 4.86       | 237.22            | 14.48            | .710                          | 55.62                  | 59.30   | 8 Gr. Jersey  |
| 10          | 338           | 5474.2                 | 4.59       | 251.38            | 16.19            | .743                          | 62.75                  | 62.84   | 9 Gr. Jersey  |
| 12          | 341           | 6057.0                 | 4.60       | 278.79            | 17.76            | .817                          | 69.66                  | 69.69   | 12 Gr. Jersey |
| 13          | 343           | 5926.4                 | 4.41       | 261.16            | 17.27            | .761                          | 68.15                  | 65.27   | 9 Gr. Jersey  |
| 14          | 347           | 5088.5                 | 4.76       | 242.2             | 14.66            | .697                          | 58.52                  | 60.55   | 9 Gr. Jersey  |
| 15          | 308           | 4529.8                 | 3.49       | 158.07            | 14.70            | .513                          | 52.09                  | 39.51   | 9 Gr. Jersey  |
| 16          | 303           | 5195.0                 | 4.59       | 238.65            | 17.14            | .787                          | 59.74                  | 59.66   | 8 Reg. Jersey |
| 17          | 360           | 5506.6                 | 5.07       | 279.30            | 15.29            | .776                          | 63.33                  | 69.82   | 6 Gr. Jersey  |
| 18          | 337           | 3160.8                 | 6.34       | 190.34            | 9.37             | .564                          | 36.35                  | 47.58   | 4 Reg. Jersey |
| 19          | 336           | 5201.5                 | 5.07       | 263.78            | 15.48            | .785                          | 59.82                  | 65.94   | 3 Reg. Jersey |
| 20          | 330           | 6427.3                 | 4.51       | 290.06            | 19.47            | .878                          | 73.91                  | 72.51   | 7 Gr. Jersey  |
|             |               | 102783.7               |            | 4615.87           |                  | \$1181.81                     | \$1153.78              |         |               |

able distance for storing the manure as it is removed from the stable. In this way its valuable constituents may be saved and applied to the fields at the proper time. The products of the herd are sold in the neighboring town, in the form of milk, skimmilk, cream and butter, and are eagerly sought because of their high

quality which is secured by the care exercised in producing them. A short distance from the barn a dairy house has been erected and equipped with an engine, boiler, separator, churn and cooling apparatus. The whole constitutes a neat equipment and should interest any man who cares to do things well. The production of the herd is above the average, though not as high as one might expect from grade Jerseys. The best cow produced 292.82 pounds of butter fat, while the poorest yielded only 158.07 pounds in a year. The average for all the cows was 242.94 pounds of butter fat. A finely bred Jersey bull is at the head of the herd, the intention being to select for greater production. It has been the practice to weigh the milk from the different cows of this herd for some time, so that the taking of samples was little additional trouble. The interest taken in the work and the care exercised in weighing and sampling add greatly to the value of the results obtained.

During the summer months, the herd received in addition to pasture, three pounds of bran and five pounds of clover hay per day. In winter the ration was composed of three and one-half pounds of bran, twenty-five to thirty pounds of corn and cow-pea silage and either six pounds of timothy and clover hay or five pounds each of clover hay and corn stover. The amount of cow-peas in the silage was not large though it added materially to its value. The peas were planted with the corn to which they attached themselves as they grew, allowing both to be cut at the same time. From the amounts just given it is quite clear that the owner erred in feeding too little concentrated food. His thought was to feed as much rough farm-grown food as possible but in so doing the digestive capacity was overtaxed by bulky material. Slightly more concentrates in the form of bran or oats should have been fed and the timothy replaced by clover, cow-pea or alfalfa hay. It is *never* advisable to feed timothy to dairy cattle when leguminous hays can be secured at anything like reasonable prices. A *large* use of *farm-grown foods* should be made, for they contribute to *economy*. Not often can a criticism

of this kind be made yet its appropriateness in this particular herd will be evident when it is noted that the average weight of the cows was under rather than over 1,000 pounds.

## Herd No. 20.

J. H.

We have for consideration in this herd fifteen grade Jersey and grade Holstein cows at an average age of about six years. The production as noted in Table 18, is only slightly above the average, which shows that there is still considerable opportunity for improvement. The present superiority of this herd over those in the community is due primarily to the use of a dairy sire for the past few years. The equipment of the farm is satisfactory

Table 18. Herd No. 20.

J. H.

|             | No.           | Total milk | Percent fat. | Total fat. | Av. milk per day. | Av. fat per day. | Value milk at \$1.15 per 100. | Value B. F. at 25c lb. | Age. | Breed.        |
|-------------|---------------|------------|--------------|------------|-------------------|------------------|-------------------------------|------------------------|------|---------------|
| Best Cow..  | 7             | 7529.5     | 3.93         | 296.09     | 21.88             | .861             | \$86.59                       | \$74.02                | 7    | Gr. Jersey    |
| Poorest cow | 11            | 2980.0     | 4.56         | 136.02     | 13.30             | .607             | 34.27                         | 34.00                  | 8    | Gr. Holstein  |
| Av. of herd |               | 6106.3     | 3.84         | 235.04     | 20.68             | .796             | \$70.22                       | \$58.76                |      |               |
| No. cow.    | Days in milk. |            |              |            |                   |                  |                               |                        |      |               |
| 1           | 222           | 5515.2     | 3.63         | 200.2      | 24.84             | .901             | \$63.42                       | \$50.05                | 7    | Gr. Jersey    |
| 2           | 288           | 6661.2     | 3.97         | 264.42     | 23.12             | .918             | 76.60                         | 66.10                  | 7    | Gr. Jersey    |
| 3           | 316           | 8652.6     | 3.31         | 286.44     | 27.38             | .906             | 99.50                         | 71.61                  | 7    | Gr. Jersey    |
| 5           | 239           | 6789.5     | 3.84         | 260.97     | 28.40             | 1.091            | 78.08                         | 65.24                  | 4    | Gr. Holstein  |
| 6           | 316           | 6526.3     | 4.18         | 272.81     | 20.65             | .863             | 75.05                         | 68.20                  | 4    | Gr. Holstein  |
| 7           | 344           | 7529.5     | 3.93         | 296.09     | 21.88             | .861             | 86.59                         | 74.02                  | 7    | Gr. Jersey    |
| 8           | 309           | 6469.4     | 3.90         | 252.48     | 20.93             | .817             | 74.40                         | 63.12                  | 9    | Gr. Shorth'rn |
| 9           | 337           | 5079.1     | 3.62         | 183.83     | 15.07             | .545             | 58.41                         | 45.95                  | 4    | Gr. Holstein  |
| 10          | 323           | 6572.7     | 3.91         | 256.99     | 23.48             | .795             | 75.59                         | 64.24                  | 8    | Gr. Holstein  |
| 11          | 224           | 2980.0     | 4.56         | 136.02     | 13.30             | .607             | 34.27                         | 34.00                  | 8    | Gr. Holstein  |
| 12          | 286           | 6731.7     | 3.67         | 247.29     | 23.53             | .864             | 77.41                         | 61.83                  | 5    | Gr. Holstein  |
| 14          | 316           | 5598.3     | 3.73         | 208.74     | 17.71             | .660             | 64.38                         | 52.19                  | 4    | Gr. Holstein  |
| 15          | 342           | 4972.0     | 3.95         | 195.16     | 14.50             | .570             | 57.18                         | 48.79                  | 4    | Gr. Holstein  |
| 16          | 239           | 5675.9     | 4.46         | 253.01     | 27.93             | 1.054            | 65.27                         | 63.26                  | 4    | Gr. Holstein  |
| 17          | 326           | 5842.5     | 3.61         | 211.15     | 17.92             | .647             | 67.19                         | 52.79                  | 4    | Gr. Jersey    |
|             |               | 91595.9    |              | 3525.61    |                   |                  | \$1053.34                     | \$881.39               |      |               |

though the barns and surroundings are not arranged or kept in condition to facilitate work. The silage corn which is preserved in two stave silos forms an important part of the winter ration. During the winter months, the cows other than strippers receive about six pounds of bran, and two pounds of cotton seed meal, together with thirty pounds silage and seven pounds clover hay. Part of the time some corn meal was used in place of cotton seed meal. The summer feeding beside pasture, consisted of three pounds clover hay, part of the time supplemented by four pounds bran early in the season and three pounds corn meal late in summer. For a large part of the summer nothing was fed in addition to the pasture. Two hundred and fifty dollars worth of milk was produced by the herd in two months from fifteen acres of pasture. This gives a fair return for short time but we must bear in mind that such production cannot be maintained throughout the season. One striking thing about the herd is its uniformity in production. The range in butter fat yield extends from 136.02 pounds to 296.09 pounds, the average of the herd being 235.04 pounds. A pure-bred dairy sire of apparently good breeding is now heading the herd. Considerable interest was taken in the test, resulting in the elimination of some of the low producers. With cows of this quality it is an easy task to develop a herd capable of large production.

**Herd No. 21.****H. H.**

The maintenance of good dairy herds to supply our great centers of population with milk for direct consumption, will always be an important matter. The present indications are that the demand will tend to increase as the people are educated to appreciate the importance of milk as a part of the regular diet and are assured that the supply can not only be obtained at a reasonable price, but is also of a wholesome nature. It is the business of the dairyman who has access to this market to not only supply milk of good quality, but to produce it as cheaply as possible. To do this *efficient* cows are a necessity.

The owner of herd No. 21 is shipping milk to a neighbor-



ing city. With this thought in mind, let us study his problem to see if there is any necessity on his part to determine the individual capacity of his own cows. If for convenience we assume that the cost of food was uniform, then the return per cow for milk at \$1.15 per hundred varied from \$39.40 to \$102. 15 per year. Between these extremes there are all gradations of production from a cow that hardly pays expenses for food to those that are decidedly profitable. It is not to be supposed that the cost of feeding the different cows was uniform, it being larger perhaps in cases of liberal production, yet it should be understood that the cost was not in proportion to the production, which fact goes to emphasize the difference in the ability of certain cows to use food economically. In this herd, then, some cows were not producing as much milk from a given amount of food as were others, consequently, the only rational procedure was to find out which they were and to replace them by individuals that use food to better advantage. Hence the necessity for weighing the milk and testing for butter fat in order to keep the quality up to requirements. Whether used for *direct consumption* or *buttermaking* a knowledge of the *butter fat content* of milk is *imperative*.

The results obtained by testing herd No. 21 show clearly the necessity of "*spotting the robber cow*." By removing a few individuals of low capacity the return from the remaining cows may be largely increased as shown in Table 8, Herd No. 7. In Herd No. 21, cow No. 7 is decidedly profitable, but such cows as No. 11 do not contribute very rapidly to the dairyman's wealth.

Table 19. Herd No. 21.

|             |             | Table 19. Herd No. 21. |            |                   |                  |                               |                        |          | H. H.           |  |
|-------------|-------------|------------------------|------------|-------------------|------------------|-------------------------------|------------------------|----------|-----------------|--|
| No.         | Total milk. | Percent fat.           | Total fat. | Av. milk per day. | Av. fat per day. | Value milk at \$1.15 per 100. | Value B. F. at 25c lb. | Age.     | Breed.          |  |
| Best cow..  | 7 8882.3    | 3.75                   | 332.77     | 24.33             | .911             | \$102.15                      | \$83.19                | 4        | Gr. Holstein    |  |
| Poorest cow | 11 4025.1   | 3.55                   | 143.12     | 15.90             | .565             | 46.29                         | 35.78                  | 6        | Gr. Holstein    |  |
| Av. of herd |             | 5970.92                | 4.06       | 242.87            | 20.39            | .829                          | \$68.67                | \$60.71  |                 |  |
| No.         | Days        |                        |            |                   |                  |                               |                        |          |                 |  |
| cow.        | in milk.    |                        |            |                   |                  |                               |                        |          |                 |  |
| 1           | 311         | 6524.5                 | 4.28       | 279.22            | 20.97            | .897                          | \$75.03                | \$69.80  | 6 Gr. Holstein  |  |
| 2           | 262         | 5446.0                 | 4.68       | 254.72            | 20.78            | .972                          | 62.63                  | 63.68    | 5 Gr. Holstein  |  |
| 3           | 324         | 8390.0                 | 3.91       | 328.12            | 25.89            | 1.012                         | 96.49                  | 82.03    | 6 Gr. Holstein  |  |
| 4           | 340         | 6498.6                 | 4.37       | 284.02            | 19.11            | .835                          | 74.73                  | 71.01    | 6 Gr. Holstein  |  |
| 5           | 196         | 3644.4                 | 4.09       | 149.00            | 18.59            | .760                          | 41.91                  | 37.25    | Gr. Holstein    |  |
| 6           | 317         | 7613.1                 | 3.78       | 287.8             | 24.01            | .907                          | 87.55                  | 71.95    | 4 Gr. Shorth'n  |  |
| 7           | 365         | 8882.3                 | 3.75       | 332.77            | 24.33            | .911                          | 102.15                 | 83.19    | 4 Gr. Holstein  |  |
| 8           | 299         | 6418.6                 | 4.10       | 263.35            | 21.46            | .880                          | 73.81                  | 65.84    | 6 Gr. Jersey    |  |
| 9           | 289         | 5471.1                 | 4.51       | 246.70            | 18.93            | .853                          | 62.92                  | 61.68    | 7 Gr. Holstein  |  |
| 10          | 280         | 4877.4                 | 3.87       | 188.57            | 17.41            | .073                          | 56.09                  | 47.14    | 11 Gr. Shorth'n |  |
| 11          | 253         | 4025.1                 | 3.55       | 143.12            | 15.90            | .565                          | 46.29                  | 35.78    | 6 Gr. Holstein  |  |
| 12          | 281         | 5501.3                 | 4.81       | 224.53            | 19.57            | .798                          | 63.26                  | 56.13    | 5 Gr. Holstein  |  |
| 13          | 315         | 5498.0                 | 4.42       | 242.79            | 17.45            | .770                          | 63.23                  | 60.70    | 5 Gr. Holstein  |  |
| 14          | 303         | 7355.7                 | 3.65       | 269.27            | 24.27            | .888                          | 84.59                  | 67.32    | 5 Gr. B. Swiss  |  |
| 17          | 256         | 3417.8                 | 4.38       | 149.71            | 13.35            | .584                          | 39.40                  | 37.43    | 4 Gr. Shorth'n  |  |
|             |             | 89563.9                |            | 3643.69           |                  |                               | \$1030.08              | \$910.93 |                 |  |

In table 20, Herd No. 21, the weekly production of three cows freshing at the same time, is compared for six consecutive weeks. So far as can be determined they were of approximately the same age yet for the period indicated the production of No. 3 was practically double that of either No. 15 or No. 16. Cows such as No. 3 are worthy of skillful management and the best attention while those like Nos. 15 and 16 should be disposed of for obvious reasons.

During the summer, this herd received no food other than that furnished by pasture. The winter ration consisted of 8 pounds bran, one pound corn meal, 30 pounds silage and six pounds clover hay. The cows were medium sized grades many showing Holstein characteristics. Throughout the year, the

herd was in excellent health, everything indicated that they were performing well up to the limit of their ability. Milk production is the main feature upon this farm because the value of cows is recognized in maintaining the productivity of the soil. An attempt is being made to secure a stand of alfalfa which, together with corn grown for the silo, will assure the herd an excellent supply of cheap nutritious food.

## Herd No. 21.

Table 20. A Comparison of the Weekly Production of Nos. 15 and 16 with No. 3. Note Date of Calving and Date of Test.

| No.<br>cow | Date of<br>calving. | Week<br>ending. | Pounds<br>milk | Pounds<br>butter fat. |
|------------|---------------------|-----------------|----------------|-----------------------|
| 15         | May 14, 1904        | July 7          | 118.6          | 4.74                  |
| 15         | May 14, 1904        | July 14         | 118.2          | 4.72                  |
| 15         | May 14, 1904        | July 21         | 118.1          | 4.72                  |
| 15         | May 14, 1904        | July 28         | 114.7          | 4.58                  |
| 15         | May 14, 1904        | Aug. 4          | 114.6          | 4.58                  |
| 15         | May 14, 1904        | Aug. 11         | 101.1          | 4.15                  |
| 16         | May 18, 1904        | July 7          | 122.2          | 4.75                  |
| 16         | May 18, 1904        | July 14         | 110.4          | 4.15                  |
| 16         | May 18, 1904        | July 21         | 99.5           | 3.38                  |
| 16         | May 18, 1904        | July 28         | 99.7           | 3.39                  |
| 16         | May 18, 1904        | Aug. 4          | 104.8          | 3.56                  |
| 16         | May 18, 1904        | Aug. 11         | 101.1          | 3.64                  |
| 3          | May 18, 1904        | July 7          | 242.2          | 8.23                  |
| 3          | May 18, 1904        | July 14         | 236.8          | 8.03                  |
| 3          | May 18, 1904        | July 21         | 214.7          | 7.30                  |
| 3          | May 18, 1904        | July 28         | 200.7          | 6.82                  |
| 3          | May 18, 1904        | Aug. 4          | 196.6          | 6.68                  |
| 3          | May 18, 1904        | Aug. 11         | 155.9          | 5.77                  |

## Herd No. 23.

H. A. P.

The milk from this herd is delivered to a co-operative creamery the skimmilk being returned to the farm. A glance at Table 21 shows the low average production, which is to be accounted for, not only by the poor quality of the herd, but also by a tendency on the part of the owner to avoid a ration in winter which would be conducive to milk production. He recognized the quality of his herd, but because of bad roads in winter and lack of suitable stables he preferred to produce the milk largely

from pasture, wintering the herd on red top and corn stover. He has a large amount of cheap pasture land and by allowing the cows to come fresh during the early spring they produce a fair amount of milk perhaps, until cold weather. Some cows continue to milk all winter, yet for some weeks there is no milk delivered from the farm. The argument is, that by having cheap cows and cheap pasture, the production is nearly clear gain, as the food consumed in winter is of secondary importance, because the corn is fed to swine and the red top seed removed and sold. There is perhaps a grain of truth in this argument, but a study of the herd and its surroundings leads straight to the conclusion that if better cattle were obtained and more suitable stables provided, the labor now expended would give a larger return and that with more effort a proportionately greater return could be obtained.

If the food consumed had not been exceedingly cheap, the herd would have been kept at a loss. There is not much profit in a herd of this kind under any conditions, yet under the peculiar circumstances indicated, it is possible that the owner realized a small gain. The skim milk returned to the farm is turned to good account in feeding swine and must be credited to the herd, yet a larger production of milk would afford more skim milk for pork making. The fact is also overlooked that the creamery needs support during the winter and that butter fat usually commands a higher price at that time. Only one cow produced over 200 pounds of butter fat, seven produced between 150 and 200 pounds, the remainder of the 25 cows being below this amount, two cows yielding less than 100 pounds. The herd is worthy of a better record under different conditions. Since the testing began, a pure-bred sire has been introduced by which in conjunction with better methods it is hoped to see the herd put into better productive form.\*

| Table 21. Herd No. 23. |             |              |            |                   |                  |                               |                        |          |        | H. A. P.     |  |
|------------------------|-------------|--------------|------------|-------------------|------------------|-------------------------------|------------------------|----------|--------|--------------|--|
| No.                    | Total milk. | Percent fat. | Total fat. | Av. milk per day. | Av. fat per day. | Value milk at \$1.15 per 100. | Value B. F. at 25c lb. | Age.     | Breed. |              |  |
| Best cow..             | 24          | 4337.2       | 4.96       | 215.55            | 18.53            | .921                          | \$49.87                | \$53.88  | 7      | Gr. Jersey   |  |
| Poorest cow            | 26          | 1845.8       | 4.24       | 78.34             | 5.46             | .237                          | 21.22                  | 19.58    | 2      | Native.      |  |
| Av. of herd            |             | 3314.1       | 4.28       | 142.05            | 13.43            | .576                          | \$38.11                | \$35.51  |        |              |  |
| No.                    | Days        |              |            |                   |                  |                               |                        |          |        |              |  |
| cow.                   | in milk.    |              |            |                   |                  |                               |                        |          |        |              |  |
| 1                      | 207         | 2399.4       | 4.64       | 111.34            | 11.59            | .537                          | \$27.58                | \$27.83  | 2      | Jersey       |  |
| 2                      | 236         | 2577.8       | 3.26       | 84.04             | 10.92            | .356                          | 29.64                  | 21.01    | 2      | Jersey       |  |
| 3                      | 236         | 3495.2       | 4.22       | 147.69            | 14.81            | .625                          | 40.19                  | 36.92    | 2      | Gr. Jersey   |  |
| 4                      | 234         | 3521.1       | 4.75       | 167.30            | 15.04            | .714                          | 40.49                  | 41.82    | 5      | Gr. Jersey   |  |
| 5                      | 258         | 3019.7       | 4.70       | 141.95            | 11.70            | .550                          | 34.72                  | 35.48    | 4      | Gr. Jersey   |  |
| 6                      | 255         | 3804.5       | 4.92       | 187.37            | 14.91            | .734                          | 43.75                  | 46.84    | 5      | Jersey       |  |
| 7                      | 230         | 2933.7       | 4.54       | 133.21            | 12.75            | .579                          | 33.73                  | 33.30    | 6      | Gr. Jersey   |  |
| 8                      | 232         | 2903.9       | 5.21       | 151.57            | 12.51            | .653                          | 33.39                  | 37.89    | 2      | Jersey       |  |
| 9                      | 246         | 3931.5       | 3.66       | 144.02            | 15.98            | .585                          | 45.21                  | 36.00    | 8      | Holstein     |  |
| 10                     | 230         | 3222.8       | 4.00       | 129.11            | 14.01            | .561                          | 37.06                  | 32.27    | 8      | Gr. Jersey   |  |
| 11                     | 249         | 3654.0       | 4.07       | 148.76            | 14.67            | .597                          | 42.02                  | 37.19    | 5      | Jersey       |  |
| 12                     | 246         | 3496.3       | 4.75       | 166.36            | 14.21            | .676                          | 40.20                  | 41.59    | 5      | Gr. Holstein |  |
| 13                     | 227         | 4249.7       | 4.19       | 178.10            | 18.71            | .784                          | 48.87                  | 44.52    | 5      | Gr. Jersey   |  |
| 14                     | 365         | 3543.2       | 4.42       | 156.64            | 9.70             | .429                          | 40.70                  | 39.16    | 6      | Gr. Jersey   |  |
| 15                     | 206         | 3154.4       | 4.61       | 145.85            | 15.79            | .708                          | 36.27                  | 36.46    | 2      | Native       |  |
| 16                     | 251         | 3016.9       | 3.93       | 118.84            | 12.19            | .473                          | 34.69                  | 29.71    | 2      | Gr. Holstein |  |
| 18                     | 233         | 3004.2       | 4.00       | 120.27            | 12.80            | .516                          | 34.54                  | 30.06    | 4      | Native       |  |
| 19                     | 249         | 4336.0       | 3.23       | 140.37            | 17.41            | .563                          | 49.86                  | 35.09    | 6      | Holstein     |  |
| 20                     | 213         | 3320.9       | 4.09       | 135.95            | 15.59            | .638                          | 38.19                  | 33.98    | 5      | Gr. Jersey   |  |
| 21                     | 273         | 4187.3       | 4.43       | 185.76            | 15.33            | .680                          | 48.15                  | 46.44    | 5      | Gr. Jersey   |  |
| 22                     | 206         | 3114.1       | 4.28       | 133.48            | 15.11            | .647                          | 35.81                  | 23.37    | 5      | Gr. Jersey   |  |
| 23                     | 239         | 3190.8       | 3.94       | 125.81            | 13.35            | .526                          | 36.69                  | 31.45    | 4      | Native       |  |
| 24                     | 234         | 4337.2       | 4.96       | 215.55            | 18.53            | .921                          | 49.87                  | 53.88    | 7      | Gr. Jersey   |  |
| 25                     | 276         | 2594.2       | 4.23       | 109.77            | 9.39             | .397                          | 30.03                  | 27.44    | 4      | Angus        |  |
| 26                     | 338         | 1845.8       | 4.24       | 78.34             | 5.46             | .237                          | 21.22                  | 19.58    | 2      | Native       |  |
|                        |             | 82854.6      |            | 3557.45           |                  |                               | \$952.85               | \$879.25 |        |              |  |

## Herd No. 24.

## C. V. S.

Although small in numbers, this is doubtless the most profitable herd reported in this circular. With the exception of one cow, No. 9 which produced only 161.46 pounds of butter fat, they all made good records. Five cows produced more than 400 pounds of butter fat, No. 1 reaching the amount of 477.3



pounds during the year. This herd illustrates very well the great advantages to be realized from the use of good blood. The poorest cow, an Angus, could not be expected to produce milk

| Table 22. Herd No. 24. |               |             |              |            |                   |                  |                               |                        |      | C. V. S.     |  |
|------------------------|---------------|-------------|--------------|------------|-------------------|------------------|-------------------------------|------------------------|------|--------------|--|
|                        | No.           | Total milk. | Percent fat. | Total fat. | Av. milk per day. | Av. fat per day. | Value milk at \$1.15 per 100. | Value B. F. at 25c lb. | Age. | Breed.       |  |
| Best cow..             | 1             | 6911.4      | 6.91         | 477.3      | 21.80             | 1.50             | \$79.48                       | \$119.32               | 6    | Jersey       |  |
| Poorest cow            | 9             | 3477.6      | 4.64         | 161.46     | 29.22             | 1.35             | 39.99                         | 40.36                  | 15   | Gr. Angus    |  |
| Av. of herd            |               | 5921.41     | 5.91         | 350.17     | 21.10             | 1.25             | \$68.09                       | \$87.54                |      |              |  |
| No. cow.               | Days in milk. |             |              |            |                   |                  |                               |                        |      |              |  |
| 1                      | 317           | 6911.4      | 6.91         | 477.3      | 21.80             | 1.50             | \$79.48                       | \$119.32               | 6    | Jersey       |  |
| 2                      | 337           | 6746.8      | 6.00         | 405.0      | 20.02             | 1.20             | 77.58                         | 101.25                 | 7    | Gr. Jersey   |  |
| 3                      | 288           | 6734.1      | 6.38         | 429.7      | 23.37             | 1.49             | 77.44                         | 107.42                 | 6    | Gr. Holstein |  |
| 4                      | 323           | 7349.1      | 5.58         | 410.35     | 22.75             | 1.27             | 84.51                         | 102.58                 | 7    | Gr. Jersey   |  |
| 5                      | 294           | 6739.7      | 6.19         | 416.93     | 22.92             | 1.41             | 77.50                         | 104.23                 | 8    | Jersey       |  |
| 6                      | 272           | 5485.0      | 4.85         | 266.00     | 20.16             | .977             | 63.07                         | 66.50                  | 8    | Gr. Shorth'n |  |
| 7                      | 307           | 5562.1      | 5.63         | 313.44     | 18.11             | 1.02             | 63.96                         | 78.36                  | 1    | Gr. Shorth'n |  |
| 8                      | 263           | 4286.9      | 6.33         | 271.40     | 16.30             | 1.03             | 49.29                         | 67.85                  | 15   | Gr. Shorth'n |  |
| 9                      | 119           | 3477.6      | 4.64         | 161.46     | 29.22             | 1.35             | 39.99                         | 40.36                  | 15   | Gr. Angus    |  |
|                        |               | 53292.7     |              | 3151.58    |                   |                  | \$612.82                      | \$787.61               |      |              |  |

readily because she was too old and not properly bred. It will be observed however, that the high grade Jersey and Holstein stood far in the lead for butter fat production. These animals were collected by simple using *good* judgement and buying only *good* cows. Much of the success in securing good ones turns upon the *willingness* to pay a *fair* price. The milk from this herd is delivered to the local creamery so that its richness in butter fat is a decided advantage. The owner is forced to employ intensive methods, as his farm is small and not very fertile. His main source of income is from butter fat, hence the necessity of keep-cows capable of yielding a liberal quantity of rich milk from a comparatively small amount of food.

In summer they were given about two pounds of bran per day, in addition to pasture of rather ordinary quality. The

winter ration was composed of seven pounds of bran and either six pounds of corn and cob meal or three pounds of corn meal, together with a liberal allowance of mixed hay of good quality. This ration is not heavy, but the cows were of only medium size and responded well to this treatment. The *kindness* and *attention* at all times shown the herd, were instrumental in determining the results quite as much as the quantity and quality of the ration. However, without good blood we cannot hope for success. On the butter fat basis, the best cow in the herd made a return of \$119.32, while the poorest paid her owner only \$40.36. Such a variation points out clearly the possibilities in dairy farming with good cows, and the small income incident to keeping poor ones.

Table 23.

| Production of Best Cows in Different Herds. |          |        |         |        |          |         |
|---|----------|--------|---------|--------|----------|---------|
| Herd.                                       | No. of   | Pounds | Percent | Pounds | Value    | Value   |
|   | cows     |        |         |        |          |         |
|   | in herd. | milk.  | fat.    | fat.   | per 100. | 25c lb. |
| 1   | 11       | 6099.3 | 5.17    | 315.38 | \$70.14  | \$78.84 |
| 2   | 8        | 8738.7 | 3.81    | 333.35 | 100.50   | 83.34   |
| 3   | 5        | 9454.3 | 3.40    | 324.08 | 108.72   | 81.02   |
| 4   | 11       | 7445.1 | 4.82    | 358.59 | 85.62    | 89.65   |
| 6   | 20       | 9067.0 | 4.41    | 399.47 | 104.27   | 99.57   |
| 7   | 10       | 5506.8 | 4.70    | 264.01 | 63.34    | 71.30   |
| 8   | 10       | 6647.0 | 3.09    | 263.42 | 76.20    | 65.38   |
| 10  | 13       | 7291.0 | 4.31    | 314.96 | 83.84    | 78.74   |
| 11  | 9        | 6531.0 | 3.78    | 246.70 | 75.10    | 61.67   |
| 12  | 13       | 6429.4 | 3.80    | 248.36 | 73.93    | 62.09   |
| 15  | 12       | 6289.0 | 4.74    | 298.57 | 72.32    | 74.64   |
| 16  | 9        | 5292.6 | 4.49    | 237.64 | 60.86    | 59.41   |
| 17  | 7        | 6114.5 | 3.31    | 202.70 | 70.31    | 50.67   |
| 19  | 19       | 6412.7 | 4.57    | 292.82 | 73.75    | 73.20   |
| 21  | 15       | 8882.3 | 3.75    | 323.77 | 102.15   | 83.10   |
| 20  | 15       | 7529.3 | 3.93    | 296.09 | 86.59    | 74.02   |
| 23  | 25       | 4337.2 | 4.96    | 215.55 | 49.87    | 53.88   |
| 24  | 9        | 6911.4 | 6.91    | 477.30 | 79.48    | 119.32  |

This table shows the production of the best cow in each herd, and should be compared with Table 24 to appreciate the range within the herd.

Table 24.  
Production of the Poorest Cows in Different Herds.

| Herd. | No. of cows in herd. | Pounds milk. | Percent fat. | Pounds butter fat. | Value milk \$1.15 per 100. | Value B. F. 25c lb. |
|-------|----------------------|--------------|--------------|--------------------|----------------------------|---------------------|
| 1     | 11                   | 4391.3       | 3.91         | 171.67             | \$50.49                    | \$42.91             |
| 2     | 8                    | 4928.4       | 3.92         | 193.29             | 55.68                      | 48.32               |
| 3     | 5                    | 6719.1       | 3.27         | 221.13             | 77.26                      | 55.28               |
| 4     | 11                   | 4091.2       | 3.83         | 156.71             | 47.05                      | 39.18               |
| 6     | 20                   | 5796.4       | 3.65         | 211.80             | 66.65                      | 52.95               |
| 7     | 10                   | 3412.1       | 3.78         | 128.96             | 39.24                      | 32.24               |
| 8     | 10                   | 2690.8       | 3.61         | 97.17              | 29.94                      | 24.29               |
| 10    | 13                   | 3846.7       | 4.38         | 168.48             | 44.23                      | 42.12               |
| 11    | 9                    | 5551.6       | 3.01         | 167.56             | 63.84                      | 41.89               |
| 12    | 13                   | 2090.4       | 4.83         | 101.05             | 24.03                      | 25.26               |
| 15    | 12                   | 3491.1       | 3.01         | 135.29             | 40.44                      | 33.82               |
| 17    | 7                    | 3710.4       | 3.33         | 123.53             | 42.67                      | 30.88               |
| 16    | 9                    | 3751.5       | 3.99         | 150.01             | 43.14                      | 37.50               |
| 19    | 19                   | 4529.8       | 3.49         | 158.07             | 52.09                      | 39.51               |
| 20    | 15                   | 2980.0       | 4.56         | 136.02             | 34.27                      | 34.00               |
| 21    | 15                   | 4025.1       | 3.55         | 143.12             | 46.29                      | 35.78               |
| 23    | 25                   | 1845.8       | 4.24         | 78.34              | 21.22                      | 19.58               |
| 24    | 9                    | 3477.6       | 4.64         | 161.46             | 39.99                      | 40.36               |

This table shows the production of the poorest cow in each herd, and should be compared with Table 23.

Table 25.

| The Average Production of all the Cows in Each Herd. |                      |              |              |                    |                            |                     |
|--|----------------------|--------------|--------------|--------------------|----------------------------|---------------------|
| Herd.  | No. of cows in herd. | Pounds milk. | Percent fat. | Pounds butter fat. | Value milk \$1.15 per 100. | Value B. F. 25c lb. |
| 1  | 11                   | 5753.05      | 4.54         | 261.61             | \$66.16                    | \$65.40             |
| 2  | 8                    | 7376.40      | 3.19         | 267.75             | 84.82                      | 66.93               |
| 3  | 5                    | 8056.78      | 3.42         | 275.78             | 92.65                      | 68.94               |
| 4  | 11                   | 6219.77      | 3.89         | 242.32             | 71.52                      | 60.58               |
| 6  | 20                   | 7873.19      | 3.62         | 285.21             | 90.54                      | 71.30               |
| 7  | 10                   | 4524.75      | 3.76         | 170.49             | 52.03                      | 42.62               |
| 8  | 10                   | 4485.70      | 4.29         | 192.51             | 51.58                      | 48.12               |
| 10   | 13                   | 5430.86      | 4.18         | 227.31             | 62.45                      | 56.31               |
| 11   | 9                    | 5969.44      | 3.43         | 205.02             | 68.64                      | 51.25               |
| 12   | 13                   | 4503.65      | 3.89         | 175.41             | 51.79                      | 43.85               |
| 15   | 12                   | 5127.80      | 4.03         | 206.78             | 58.96                      | 51.69               |
| 16   | 9                    | 4607.50      | 3.98         | 183.52             | 52.98                      | 45.88               |
| 17   | 7                    | 4354.65      | 3.96         | 172.64             | 50.08                      | 43.16               |
| 19   | 19                   | 5409.66      | 4.11         | 242.94             | 62.21                      | 60.73               |
| 20   | 15                   | 6106.30      | 3.84         | 235.04             | 70.22                      | 58.76               |
| 21   | 15                   | 5970.92      | 4.06         | 242.87             | 68.67                      | 60.71               |
| 23   | 25                   | 3314.10      | 4.28         | 142.05             | 38.11                      | 35.51               |
| 24   | 9                    | 5921.41      | 5.91         | 350.17             | 68.09                      | 87.54               |
| Average  | .....                | 5616.99      | 4.03         | 226.63             | \$64.52                    | \$56.62             |

By arranging the average production per cow in the various herds, in one table as given here, the striking differences are clearly shown.

Table 26.  
Best Herd, No. 24.

|                 | Milk.   | Percent fat. | Butter fat. | Av. milk per day. | Av. fat per day. | Milk \$1.15 per 100. | Butter fat 25c per lb. |
|-----------------|---------|--------------|-------------|-------------------|------------------|----------------------|------------------------|
| Best, No. 1 ... | 6911.4  | 6.91         | 477.30      | 21.86             | 1.50             | \$79.48              | \$119.32               |
| Poorest, No. 9. | 3477.6  | 4.64         | 161.46      | 29.22             | 1.35             | 39.99                | 40.36                  |
| Average .....   | 5921.41 | 5.91         | 350.17      | 21.10             | 1.25             | 68.09                | 87.54                  |

Poorest Herd, No. 23.

|                  |        |      |        |       |     |         |         |
|------------------|--------|------|--------|-------|-----|---------|---------|
| Best, No. 24..   | 4337.2 | 4.96 | 215.55 | 18.53 | .92 | \$49.87 | \$53.88 |
| Poorest, No. 26. | 1845.8 | 4.24 | 78.34  | 5.46  | .24 | 21.22   | 19.58   |
| Average .....    | 3314.1 | 4.28 | 142.05 | 13.43 | .57 | 38.11   | 35.51   |

An Average Herd, No. 20.

|                 |        |      |        |       |      |         |         |
|-----------------|--------|------|--------|-------|------|---------|---------|
| Best, No. 7.... | 7529.5 | 3.93 | 296.09 | 21.88 | .861 | \$86.59 | \$74.02 |
| Poorest, No. 11 | 2980.0 | 4.56 | 136.02 | 13.30 | .607 | 34.27   | 34.00   |
| Average .....   | 6106.3 | 3.84 | 235.04 | 20.68 | .796 | 70.22   | 58.76   |

The above shows at a glance, a view of the whole range of production in the herds tested. The amounts yielded by the best cow, the poorest cow and the average of the herd are given in the best herd, poorest herd, and an average herd.

Table 27.

Average Production—Poorest and Best Herds.

|                     |    |         |      |        |         |         |
|---------------------|----|---------|------|--------|---------|---------|
| Best, No. 24.....   | 9  | 5921.41 | 5.91 | 350.17 | \$68.09 | \$87.54 |
| Poorest, No. 23.... | 25 | 3314.10 | 4.28 | 142.05 | 38.11   | 35.51   |
|                     |    | 2607.31 |      | 208.12 | \$29.98 | \$52.03 |

Difference in butter fat=146.5 percent.

Average Production—Poorest and an Average Herd.

|                     |    |         |      |        |         |         |
|---------------------|----|---------|------|--------|---------|---------|
| Av., No. 10.....    | 13 | 5430.86 | 4.18 | 227.31 | \$62.45 | \$56.31 |
| Poorest, No. 23.... | 25 | 3314.10 | 4.28 | 142.05 | 38.11   | 35.51   |
|                     |    | 2116.76 |      | 85.26  | \$24.34 | \$20.80 |

Difference in butter fat=60 percent.



|                                     |                        |
|-------------------------------------|------------------------|
| Best 10 cows tested.....            | 388.75 lb. butter fat. |
| Poorest 10 cows tested.....         | 109.42 lb. butter fat. |
| Average all cows tested .....       | 226.62 butter fat.     |
| Average poorest herd.....           | 142.05 butter fat.     |
|                                     | 84.57 butter fat.      |
| Best 10 cows tested.....            | 388.75 butter fat.     |
| Average poorest herd.....           | 142.05 butter fat.     |
|                                     | 246.70 butter fat.     |
| Cows in Illinois.....               | 995,429                |
| 25 per cent improved.....           | 248,857                |
| Unimproved.....                     | 746,572                |
| 746,572 x 84.57 lbs. ....           | 63,137,594.04 lbs      |
| 63,137,594.04 lbs. at 25 cents..... | \$15,784,398.51        |
| 746,572 x 246.7 lbs. ....           | 184,179,312.4 lbs.     |
| 184,179,312.4 lbs. at 25 cents..... | \$46,044,828.00        |

The material in Table 27 has been arranged to aid the reader in contrasting the different degrees of production, and to show as clearly as possible the ease with which the producers of dairy products may realize a larger return for their efforts. The difference between the average production of the poorest herd and that of the best herd is 208.1 pounds butter fat a year. This difference is 146.5 per cent of the average production of butter fat in the poorest herd. The difference between the production of the poorest herd and an average herd, is 85.26 pounds butter fat per cow or 60 per cent of that in the poorest herd. It is interesting to note that the best 10 cows have an average annual record of 388.75 pounds of butter fat five of them belonging to one herd. The poorest 10 cows have an average record of 109.42 pounds butter fat, six of them being members of the same herd. The average annual production of all cows tested is 226.62 pounds butter fat, an amount 84.57 pounds greater than the average production of the poorest herd. In this connection, it should be borne in mind that the average yield of butter fat for a dairy cow

in this State is approximately 140 *pounds*. It is apparent then, that there are numerous inferior animals which should be removed. According to the last report (1905) of the Secretary of Agriculture, there are in Illinois 995,429 dairy cows. It is doubtful if one-fourth of this number, namely, 248,857, are very much improved, but for lack of definite knowledge upon this point, we will assume that such is the case. Granting this, there remains then 746,572 cows of such low average production that an increase of 82.52 pounds of butter fat per cow, can be readily brought about by rational breeding, selection and feeding. Such an increase amounts to \$21.14 per cow or for three-fourths of the dairy cows in Illinois, an increased return per year to the dairy farmers alone, of \$15,784,398.51. With a herd of fifteen cows, this would amount to \$317.10 annually, minus a slight increase in the cost of food incident to the greater production. Such a modest improvement can be easily realized, for it requires a raise in the average production of only 84.57 pounds which is from our present low average to the average of the herds reported in this Circular. To go a step farther, it is not at all without the range of possibility to raise the average production to that of the ten best cows, and thus secure an immensely larger sum from the dairy herds of the State. The former we must have; the latter is at least possible.

In order to substantiate what has been said concerning the possibility of raising the amount of butter fat 84.57 pounds, attention is called to Table 28. Under the heading "no grading" are grouped the herds in which there has been *no attempt* to strengthen the breeding along *dairy* lines by either the purchase of *dairy bred cows* or the use of *purebred dairy sires*. Under the heading "grading" are placed the herds in which some *concerted effort* has been made to incorporate better *dairy* blood. In each case, the average butter fat yield is given. Where "no grading" has been done, the average production per cow is 177.62 pounds, while in those herds where "grading" has been practiced, the average production is 263.09 pounds. Here then we have a difference of 85.47 pounds in *favor* of the practice of "grading up."

These results are very striking as they show conclusively that the productive capacity of the dairy herds of the state, by conservative estimate, may be increased \$16,000,000 a year through the use of pure-bred sires and selection by the Babcock test. The sires are available; testing involves little trouble, so it remains with the dairy farmers to bring about this change which may be accomplished in four years. The actual difference between the "graded" and "ungraded" herds is *greater* than the difference between the *poorest herd* and the *average* of the herds tested, so that no man can say that it is impossible to raise the production to that extent. Improvement has come largely through *better blood* and *better care*, and any thoughtful man can obtain the same results. Do we need better proof of the value of testing and the great improvement possible through the use of pure-bred sires? *The two are inseparable; they go hand in hand, the test pointing out the cows through which improvement should be sought, the sires adding to and intensifying the dairy capacity of the offspring.*

| No Grading.   |              |                        | Grading.      |              |                        |
|---------------|--------------|------------------------|---------------|--------------|------------------------|
| Initials.     | No. of herd. | Pounds of butter. fat. | Initials.     | No. of herd. | Pounds of butter. fat. |
| F. E. ....    | 7            | 170.49                 | F. M. R. .... | 2            | 267.75                 |
| W. W. ....    | 8            | 192.51                 | L. P. ....    | 3            | 275.78                 |
| J. H. P. .... | 12           | 175.41                 | G. W. ....    | 6            | 285.21                 |
| C. J. W. .... | 16           | 183.52                 | F. G. A. .... | 11           | 205.02                 |
| J. C. C. .... | 15           | 206.78                 | W. J. H. .... | 19           | 242.94                 |
| J. P. ....    | 17           | 172.64                 | J. H. ....    | 20           | 235.04                 |
| H. A. P. .... | 23           | 142.05                 | H. H. ....    | 21           | 242.87                 |
| Average ..... | —            | 177.02                 | C. V. S. .... | 24           | 350.17                 |
|               |              |                        | Average ..... | —            | 263.09                 |

$263.00 - 177.62 = 85.47$   
 $85.47 \text{ lb. @ } 25c = \$21.36$   
 $746.572 \times \$21.36 = \$15,946,777.92$

Until dairymen come to recognize the importance of systematic business methods and apply them in the management of their herds and farms, they need not hope to be successful.

The practice of dealing with the herd as a whole, instead of with the individual, is a source of great loss every year. In this one way the dairymen of the state let millions of dollars slip through their fingers annually that might be saved with little effort. As the foregoing discussions show, this is a serious matter, and every milk producer should acquaint himself with the possibilities of his business. With the rapid increase everywhere present, in the demand for dairy products of high quality, it is but the part of wisdom for the milk producer to meet it with first class goods produced at the lowest cost. This necessitates first of all good cows and proper nourishment. *What we need is not more dairymen but better ones.* There is not a dairy farm or a dairy herd in the state that has yet approached its *full* capacity of production.

At this stage of advancement in dairying, the fact that a cow is profitable is not sufficient. The dairyman should strive for a large profit from a small number of animals. He is not acting wisely if a cow paying a small profit is retained when a superior one can be obtained at a reasonable price. Perhaps no one thing has wrought as much havoc among milk producers as has the fruitless attempt on their part to combine dairy and beef producing qualities in the same animal. Many have tried this experiment for the better part of a life time only to come to the conclusion that anything short of the special-purpose cow has no place in the equipment of the dairyman. It is the height of foolishness for a milk producer to keep a beef bull and veal his calves, running the chances of buying good cows when needed. It is equally as bad for him to veal well-bred grade dairy calves, for the blood is needed in all dairy communities. *Who is in the business of producing dairy cows for the general market? Where is the supply to come from if each relies upon the other?* Even when milk is commanding a good price, it is wise to withhold enough to give the calves a good start. They are a valuable asset constantly *increasing* in value and will abundantly repay the effort if properly bred. Protect them from heat and flies, be liberal in feeding, for it is better to rear two good calves than to fail on a dozen. In a herd of 40 cows it cost but two dollars to

give each calf at least *one* pure-bred parent, so why not breed and rear *good* calves that will later prove their right to exist? Cows bred and reared on a particular farm are often better than those from elsewhere because they fit the environment. It is a significant fact that dairy farmers have not yet begun to *dig deep* into the possibilities of their business. They are simply scratching the surface unaware of what lies in store for them beneath, if they will put forth the effort. The world's record cow produced 857.15 pounds of butter fat in one year, equivalent to 1,000 pounds of butter. Compare this with the average of the herds reported herein, namely, 226.63 pounds. To the dairyman these are all significant things, and it would seem that even he who runs might read.

#### Summary.

1. In the 18 herds reported, including 221 cows, the average production was 5616.99 pounds milk, 226.63 pounds butter fat, and an average test of 4.03 per cent.

2. The best herd averaged 350.17 pounds; the poorest, 142.05 pounds butter fat per cow.

3. The best ten cows averaged 388.75 pounds; the poorest ten 109.42 pounds butter fat per cow.

4. The butter fat produced by the best cow (on the basis used) was worth \$119.32, while that of the poorest was worth only \$19.58.

5. At least one-third of the cows in the ordinary herds are practically unprofitable.

6. The herds in which grading has been practiced, produced 85.47 pounds butter fat per cow more than did those in which no grading has been done.

7. The scales and the Babcock test made it possible to remove five cows from a herd of ten and thereby increase the profit \$7.62 per head.

8. This circular shows conditions as they exist on dairy farms of the state, indicating that a few cows are kept at a good profit, some at a small profit, and many at an actual loss.



9. There is but one way to determine the value of a cow—test her.

10. Two serious mistakes made by Illinois dairymen in feeding their herds is their failure to provide silage, and to make a liberal use in their rations of leguminous roughness such as cow-pea, clover, and alfalfa hay. Silage should be fed in condensory districts where objected to, but the leguminous hays should be used freely as they are easily grown and since they replace expensive concentrates to a large extent, they reduce the cost of milk production.

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### FEEDING DAIRY COWS.

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By Wilber J. Fraser, Chief in Dairy Husbandry, University of Illinois, Agricultural Experiment Station.

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1. Secure the rough fodders in the best possible condition and use them liberally, as they are much cheaper than concentrates.

2. Feed concentrates in proportion to the milk flow.

3. Study and supply the individual needs of each cow.

Before man had control over animals and they became domesticated, there were no highly specialized forms, and when they roved wild on the prairies or in the forests, the problem of the particular kind and character of their food supply was not an important one for they were not expected to draw loads of several tons weight, or to produce the abnormal yields of milk that are given by the highly developed dairy cows of today. However, after man domesticated animals and began to develop breeds suited to special purposes, as draft, speed, beef, or milk, the question of their food supply became an all important one, for in order to secure the best results their food must be adapted to their special needs.

One fact of great importance, and which must not be lost sight of in economical feeding, is, that the amount, kind, and character of the food an animal requires depends entirely upon

the use to which that animal is going to put the food. A cheap team may be kept through an idle time on a kind of feed that would not be at all suited to the needs of a race horse during the training season, or of a valuable cow yielding 100 pounds of milk a day during an official test.

In order that a cow may produce the greatest yield of which she is capable she must be given the right kinds of feed and the correct amount of each. There is little use in paying high prices and establishing a good dairy herd unless careful attention is to be given to the amount and character of the feed, for however well bred and efficient the individuals they cannot give in their product what they do not receive in their food.

The nutrients contained in all feeding stuffs, as well as in animal bodies and in milk, may be divided into five classes as follows:

Water.

Ash, (mineral compounds.)

Protein, (nitrogen compounds.)

Carbohydrates, (starches, sugar, etc.)

Fats, (or oils.)

While an ample supply of pure water is one of the first requisites of good stock feeding, it is usually supplied in abundance at comparatively little cost and will not be considered further in this discussion.

Ash or mineral matter is present in all feeding stuffs in sufficient quantities so that an animal properly nourished with the other constituents is sure to receive enough mineral matter; we will, therefore, pass this group of substances also.

#### Protein.

Protein is the name applied to the constituents of feeds which contain nitrogen, and feeding stuffs which are rich in this element are frequently called nitrogenous feeds. Among these are: oil meal, cotton-seed meal, gluten meal, and the legumes, as cowpeas, alfalfa, and clover. The white of an egg, the lean part of meat, and the casein of milk are all good examples of protein.

The principal uses of protein in the body of the cow are to build muscles, replace their waste, and form casein in milk. There are two reasons why special attention should be given to the amount of protein contained in the different feeds: first, because it is usually deficient in feeds for dairy cows; second, because no other nutriment answers the same purpose.

#### Carbohydrates.

Carbohydrates is the name applied to the carbonaceous group of substances such as starch, sugar, and the woody parts of plants known as crude fiber. This group forms the larger part of the food consumed by animals, as we shall see later. Carbohydrates furnish energy to perform the body functions and for the muscular activity. The heat of the body is the result of energy expended. It takes a large amount of energy to build up a product like milk. If carbohydrates are fed in excess of the demands for energy, fat may be stored up in the body. In case of the dairy cow, carbohydrates, besides supplying the above requirements, furnish the constituents for forming milk sugar and fat in milk.

#### Fat.

Every one is familiar with fat in its different forms; as tallow in the steer, lard in the hog, and butter fat in milk. In corn there is about 4.3 per cent of fat, or oil, and in flaxseed a much larger proportion, while in most of the rough fodders there is comparatively little. Fat in the food nourishes the body in exactly the same way as do carbohydrates: namely, furnishes energy and forms fat. The chief difference between fat and carbohydrates is that the former is a more concentrated form of food, one pound being equal to 2.4 pounds of carbohydrates. It should be remembered that fat and carbohydrates are interchangeable, that is, whichever one is in excess may take the place of the other, but it must also be borne in mind that however great the excess of carbohydrates and fat in the ration, no more muscle can be formed in the body, or casein produced in the milk than there is protein in the food supplied. In other words, where protein is in excess it can take the place of carbohydrates and fat, but no amount

of carbohydrates and fat can take the place of protein in the least degree.

#### Digestible Nutrients.

The digestibility of the different constituents of feeds is of great importance, as only that portion of feeding stuffs which passes into solution during the process of digestion and is absorbed into the blood is of value in nourishing the animal. This portion of the various feeds is known as the digestible nutrients.

The difference between the total nutrients and the total digestible nutrients is marked: for example, by referring to feeding tables we find that in 100 pounds of clover hay are digestible and can be used to nourish the animal. The digestible nutrients are, therefore, the only ones considered in making up rations.

**Table 1.**  
**Digestible Nutrients Required Per Day for a 1000-Pound Cow for Maintenance and Following Yields.**

|                         | Protein,<br>lb. | Carbohy-<br>drates,<br>lb. | Fat,<br>lb. | Nutritive<br>ratio. |
|-------------------------|-----------------|----------------------------|-------------|---------------------|
| For maintenance .....   | .7              | 7.                         | .1          | 1: 10.3             |
| 10 lb. milk 3% fat..... | 1.10            | 8.81                       | .24         | 1: 8.3              |
| 10 lb. milk 4% fat..... | 1.17            | 9.16                       | .26         | 1: 8.4              |
| 10 lb. milk 5% fat..... | 1.24            | 9.51                       | .29         | 1: 8.2              |
| 20 lb. milk 3% fat..... | 1.49            | 10.62                      | .37         | 1: 7.7              |
| 20 lb. milk 4% fat..... | 1.63            | 11.32                      | .42         | 1: 7.5              |
| 20 lb. milk 5% fat..... | 1.77            | 12.02                      | .47         | 1: 7.4              |
| 30 lb. milk 3% fat..... | 1.89            | 12.43                      | .51         | 1: 7.2              |
| 30 lb. milk 4% fat..... | 2.10            | 13.48                      | .58         | 1: 7.1              |
| 30 lb. milk 5% fat..... | 2.31            | 14.53                      | .66         | 1: 7.0              |
| 40 lb. milk 3% fat..... | 2.29            | 14.24                      | .64         | 1: 6.9              |
| 40 lb. milk 4% fat..... | 2.57            | 15.64                      | .74         | 1: 6.8              |
| 40 lb. milk 5% fat..... | 2.85            | 17.04                      | .84         | 1: 6.7              |
| 50 lb. milk 3% fat..... | 2.68            | 16.05                      | .78         | 1: 6.7              |
| 50 lb. milk 4% fat..... | 3.03            | 17.80                      | .90         | 1: 6.6              |
| 50 lb. milk 5% fat..... | 3.38            | 19.55                      | 1.03        | 1: 6.5              |
| 60 lb. milk 3% fat..... | 3.08            | 17.86                      | .92         | 1: 6.5              |
| 60 lb. milk 4% fat..... | 3.50            | 19.96                      | 1.07        | 1: 6.4              |
| 60 lb. milk 5% fat..... | 3.92            | 22.06                      | 1.22        | 1: 6.3              |

Much careful study and investigation has been devoted to the question of determining the amounts of digestible protein, carbohydrates, and fat needed for cows of different weights and varying yields. To Professor T. L. Haecker belongs the credit of securing the data from which Table 1 has been computed.

In all animals there is a constant breaking down of the body tissue caused by wear, and there is energy expended in keeping up the vital processes and in maintaining the body temperature. The food used to rebuild worn-out tissues and to furnish heat and energy when the animal is at rest is called the food of maintenance. If a 1000-pound cow is producing 30 pounds of 4 per cent milk she will require digestible nutrients about as follows:

|   | Protein,<br>lb. | Carbohy-<br>drates,<br>lb. | Fat<br>lb. |
|---|-----------------|----------------------------|------------|
| For maintenance .....                             | .7              | 7.                         | .1         |
| For producing 30 lb. 4% milk.....                 | 1.40            | 6.48                       | .48        |
| Total nutrients required for maintenance and milk | 2.10            | 13.48                      | .58        |

A cow of the same weight producing 40 pounds of 4 per cent milk will require a ration containing 2.57 pounds protein, 15.64 pounds carbohydrates and .74 of a pound fat. If her yield were 50 pounds of 4 per cent milk her ration should contain 3.03 pounds protein, 17.80 pounds carbohydrates and .90 of a pound fat.

In feeding dairy cows, the fact that they should be fed according to their milk production, is frequently overlooked. A cow capable of producing 60 pounds of 4 per cent milk a day must be fed a much larger amount of digestible nutrients, if she is to produce her greatest yield, than a cow giving only 10 pounds of milk testing 3 per cent. This point should be strongly emphasized, for a cow cannot give in her product what she does not receive in her food. By referring to Table 1 the nutrients required for any yield of milk may be easily determined. If the cow weighs more or less than 1000 pounds a proportional increase or decrease in the food for maintenance should be made.

From the weight of a cow and the amount of milk she will



produce on liberal feeding the required nutrients may be determined. The next step is to select such feeds as will best supply these nutrients. We will take, for example, a 1000-pound cow producing 30 pounds of 4 per cent milk, and by referring to Table 1, find that she requires 2.1 pounds protein, 13.48 pounds carbohydrates and .58 of a pound fat.

If one wishes to feed clover hay and corn and cob meal he can make up a trial ration by taking 15 pounds of clover hay and 8 pounds of corn and cob meal. The nutritive value of each of these feeds can then be found from the table which gives the amount of digestible nutrients in 100 pounds of the different feeds. We find that 100 pounds of clover hay contains 6.8 pounds protein, 35.8 pounds carbohydrates and 1.7 pounds fat. Dividing each of these amounts by 100 we have the digestible nutrients in one pound, multiplying by 15 we have the digestible nutriments in 15 pounds, which are 1.02 pounds protein, 5.37 pounds carbohydrates and .25 of a pound fat. In the same manner are found the protein, carbohydrates and fat in 8 pounds of corn and cob meal, and taking the total digestible nutrients in the given amounts of each of these substances we have the following trial ration:

**Ration A.**

|  | Lb. | Digestible Nutrients. |                            |             |
|--|-----|-----------------------|----------------------------|-------------|
|  |     | Protein,<br>lb.       | Carbohy-<br>drates,<br>lb. | Fat,<br>lb. |
| Clover hay .....   | 15  | 1.02                  | 5.37                       | .25         |
| Corn and cob meal .....  | 8   | .35                   | 4.80                       | .23         |
|  | —   | —                     | —                          | —           |
| Total nutrients in ration .....                                    |     | 1.37                  | 10.17                      | .48         |
| Nutrients required for a 1,000-lb. cow giving 30 lb. 4% milk ..... |     | 2.1                   | 13.48                      | .58         |

By comparing the total nutrients in this ration with the required nutrients for a cow producing 30 pounds of 4 per cent milk, it is found that the ration is deficient in both protein and carbohydrates. To bring the nutrients up to the amount required

we try adding six pounds of bran and the ration is then as follows:

|  | Lb. | Digestible Nutrients. |                            |             |
|--|-----|-----------------------|----------------------------|-------------|
|  |     | Protein,<br>lb.       | Carbohy-<br>drates,<br>lb. | Fat,<br>lb. |
| Clover hay .....   | 15  | 1.02                  | 5.37                       | .25         |
| Corn and cob meal .....  | 8   | .35                   | 4.80                       | .23         |
| Bran .....   | 6   | .73                   | 2.35                       | .16         |
| Total nutrients in ration .....                                    |     | 2.10                  | 12.52                      | .64         |
| Nutrients required for a 1,000-lb. cow giving 30 lb. 4% milk ..... |     | 2.10                  | 13.48                      | .58         |

The amount of protein, carbohydrates, and fat now corresponds closely enough with the nutrients required, for all practical purposes.

If one wishes to feed clover hay, corn silage, corn meal, and ground oats, he can make up a trial ration by taking 8 pounds of clover hay, 40 pounds of silage, 4 pounds of corn meal, and 4 pounds of ground oats. The nutritive value of each of these feeds can then be determined from the amount of digestible nutrients in 100 pounds given in the table on page 15. Taking the digestible nutrients in the given amounts of each of these substances we have the following trial ration:

|   | Lb. | Digestible Nutrients. |                            |             |
|---|-----|-----------------------|----------------------------|-------------|
|   |     | Protein,<br>lb.       | Carbohy-<br>drates,<br>lb. | Fat,<br>lb. |
| Clover hay .....  | 8   | .54                   | 2.86                       | .14         |
| Corn silage .....   | 40  | .36                   | 4.52                       | .28         |
| Corn meal .....   | 4   | .31                   | 2.67                       | .17         |
| Ground oats .....   | 4   | .37                   | 1.89                       | .17         |
| Total nutrients in ration .....                                   |     | 1.58                  | 11.94                      | .76         |
| Nutrients required for a 1,000-lb. cow giving 30 lb. 4% milk..... |     | 2.10                  | 13.48                      | .58         |

By comparing the total nutrients in this ration with the required nutrients for a cow producing 30 pounds of 4 per cent

milk, it is found that the ration is deficient in both protein and carbohydrates, but needs larger proportion of protein than of carbohydrates to bring the nutrients up to the amount required. Adding one pound each of corn meal ground oats, and liseed meal, we have ration D. which is a good economical ration and fulfills the desired requirements.

#### Ration D.

|  | Lb. | Digestible Nutrients. |                            |             |
|--|-----|-----------------------|----------------------------|-------------|
|  |     | Protein,<br>lb.       | Carbohy-<br>drates,<br>lb. | Fat,<br>lb. |
| Clover hay .....   | 8   | .54                   | 2.86                       | .14         |
| Corn silage .....  | 40  | .36                   | 4.52                       | .28         |
| Corn meal .....  | 5   | .39                   | 3.34                       | .22         |
| Ground oats .....  | 5   | .46                   | 2.36                       | .21         |
| Linseed meal .....   | 1   | .29                   | .33                        | .07         |
| Total nutrients in ration .....                                    |     | 2.04                  | 13.41                      | .92         |
| Nutrients required for a 1,000-lb. cow giving 30 lb. 4% milk ..... |     | 2.10                  | 13.48                      | .58         |

#### Nutritive Ratio.

Since protein on the one hand and carbohydrates and fat on the other serve different functions in the body, the relative amount of each should be carefully considered, and the ratio of the protein to the carbohydrates, which is called the nutritive ratio is determined in the following manner: The value of a pound of fat in feeds has been found to be 2.4 times that of a pound of carbohydrates, and as fat nourishes the body in the same way as carbohydrates, the amount of fat is multiplied by 2.4 and added to the carbohydrates; this sum divided by the amount of protein gives the ratio of the protein to the carbohydrates, and is known as the nutritive ratio.

This may be illustrated by taking the total digestible nutrients in trial ration C on page 321, which contains 1.58 pounds protein, 11.94 pounds carbohydrates, and .76 of a pound fat.

$$.76 \text{ of a pound fat} \times 2.4 = 1.82.$$

$$11.94 \text{ pounds carbohydrates} + 1.82 = 13.76.$$

$$13.76 \div 1.58 \text{ (amount of protein)} = 8.7.$$

Since there are 8.7 times as much carbohydrates as protein

in this ration, the ratio is as 1:8.7; which is known as the nutritive ratio of this ration.

After adding one pound each of corn meal, ground oats, and linseed meal, we have ration D, which contains 2.04 pounds protein, 13.41 pounds carbohydrates, and .92 of a pound fat. The nutritive ratio of this ration, found in the same manner as before, is as 1:7.6; which is nearer the ratio of the digestible nutrients required for a 1000 pound cow giving 30 pounds of 4 per cent milk, as given in Table 1.

#### Balanced Ration.

If the protein and the carbohydrates are in such proportion as will best suit the needs of the animal the ration is said to be balanced. If the amount of protein in the ration is small in proportion to the carbohydrates the ration is called wide; if the amount of protein is large in proportion to the carbohydrates, the ration is called narrow.

Since the needs of different animals vary greatly, it will be seen that a ration which is balanced for one animal or class of animals may be decidedly too wide or too narrow to be economical for another class. Young and growing animals and cows producing a large flow of milk require a much larger proportion of protein, or in other words a narrow ration, than animals after they have completed their growth, or cows when given a smaller flow of milk, or entirely dry. The difference in the amount of protein required by cows giving large and small flows of milk may be seen by referring to Table 1.

In feeding dairy cows several things must be considered besides the amount of digestible nutrients contained in the feed. The ration must be palatable and of such a nature that a cow can eat a sufficient quantity to supply her needs.

There is enough nutriment contained in 300 pounds of oat straw for a cow giving 60 pounds of 4per cent milk, but it would be absurd to expect a cow to produce such a yield on oat straw alone, as her capacity could not handle more than one tenth this bulk in one day. The concentrates, too, must be in the

proper form to be best utilized by the cow. To get the most out of grains they should be ground, for the mastication is seldom, if ever, complete enough to break all the kernels, and those passing through the digestive tract unbroken are of no use to the animal and are, therefore, wasted. This difficulty may be partially obviated by mixing the grain and coarse fodder together. By feeding oats in the sheaf, or in the form of hay, or by mixing chopped hay with grain it will be much more thoroughly masticated, as grain eaten with roughage passes to the rumen and is remasticated in chewing the cud.

#### Ration E.

##### Roughage Not Palatable and Concentrates Too Heavy.

|  | Lb. | Digestible Nutrients.       |                                       |                     |
|--|-----|-----------------------------|---------------------------------------|---------------------|
|  |     | Protein,<br>Protein,<br>lb. | Carbohy-<br>drates,<br>drates,<br>lb. | Fat,<br>Fat,<br>lb. |
| Corn stover .....  | 10  | .17                         | 3.24                                  | .07                 |
| Oat straw .....  | 7   | .08                         | 2.70                                  | .06                 |
| Corn meal .....  | 8   | .62                         | 5.34                                  | .34                 |
| Linseed meal, N. P. ....   | 4   | 1.13                        | 1.60                                  | .11                 |
| Total nutrients in ration .....                                    |     | 2.00                        | 12.88                                 | .58                 |
| Nutrients required for a 1,000-lb. cow giving 30 lb. 4% milk ..... |     | 2.10                        | 13.48                                 | .58                 |
| Nutritive ratio of ration E, 1:7.1.                                |     |                             |                                       |                     |

It will be seen that this ration is correct so far as the chemical composition is concerned, but that the roughage is lacking in palatability so that a cow will not relish it, and the concentrates, while highly nutritious, are what dairymen call too heavy. Oil meal is so highly concentrated that it should not be fed in large quantities. This ration should be lightened by adding some light bulky concentrate, as bran or ground oats, and made more palatable by substituting oat hay for oat straw. After making these slight changes we have Ration F, which is lighter and more palatable, yet contains practically the same amounts of the different digestible nutrients.



**Ration F.**  
**An Economical Ration.**

|   | Lb. | Digestible Nutrients. |                            |             |
|---|-----|-----------------------|----------------------------|-------------|
|   |     | Protein,<br>lb.       | Carbohy-<br>drates,<br>lb. | Fat,<br>lb. |
| Corn stover .....   | 10  | .17                   | 3.24                       | .07         |
| Oat hay .....   | 7   | .30                   | 3.25                       | .11         |
| Corn meal .....   | 6   | .47                   | 4.00                       | .26         |
| Bran .....  | 6   | .73                   | 2.35                       | .16         |
| Linseed meal, N. P.....   | 1   | .28                   | .40                        | .03         |
| Total nutrients in ration .....                                     |     | 1.95                  | 13.24                      | .63         |
| Nutrients required for a 1,000-lb. cow giving 30 lb.. 4% milk ..... |     | 2.10                  | 13.48                      | .58         |
| Nutritive ratio of ration F, 1:7.6.                                 |     |                       |                            |             |

**Examples of Practical, Economical Rations.**

The rations given below are compounded so as to be palatable and at the same time have the proper chemical composition. They are suited to the needs of a 1000-pound cow giving 30 pounds of 4 per cent milk, the same as the preceding ones, the requirements being 2.10 pounds protein, 13.48 pounds carbohydrates and .58 of a pound fat.

**Ration G.**

|                         | Lb. | Digestible Nutrients. |                            |             |
|-------------------------|-----|-----------------------|----------------------------|-------------|
|                         |     | Protein,<br>lb.       | Carbohy-<br>drates,<br>lb. | Fat,<br>lb. |
| Clover hay .....        | 12  | .82                   | 4.30                       | .20         |
| Corn silage .....       | 40  | .36                   | 4.52                       | .28         |
| Corn meal .....         | 2   | .16                   | 1.33                       | .09         |
| Oats .....              | 2   | .18                   | .95                        | .08         |
| Bran .....              | 2   | .24                   | .78                        | .05         |
| Gluten meal .....       | 1   | .26                   | .43                        | .11         |
| Total nutrients .....   |     | 2.02                  | 12.31                      | .81         |
| Nutritive ratio, 1:7.5. |     |                       |                            |             |

## Ration H.

|                              | Lb. | Digestible Nutrients. |                            |             |
|------------------------------|-----|-----------------------|----------------------------|-------------|
|                              |     | Protein,<br>lb.       | Carbohy-<br>drates,<br>lb. | Fat,<br>lb. |
| Corn silage .....            | 30  | .27                   | 3.39                       | .02         |
| Cowpea hay .....             | 7   | .76                   | 2.70                       | .08         |
| Oat hay .....                | 7   | .30                   | 3.25                       | .10         |
| Corn and cob meal .....      | 5   | .22                   | 3.00                       | .14         |
| Bran .....                   | 3   | .37                   | 1.18                       | .08         |
| Linseed meal, N. P. ....     | 1   | .28                   | .40                        | .03         |
| <b>Total nutrients .....</b> |     | <b>2.20</b>           | <b>13.92</b>               | <b>.45</b>  |
| Nutritive ratio, 1:6.8.      |     |                       |                            |             |

## Ration I.

|                              | Lb. | Digestible Nutrients. |                            |             |
|------------------------------|-----|-----------------------|----------------------------|-------------|
|                              |     | Protein,<br>lb.       | Carbohy-<br>drates,<br>lb. | Fat,<br>lb. |
| Corn stover .....            | 10  | .17                   | 3.24                       | .07         |
| Clover hay .....             | 8   | .54                   | 2.86                       | .14         |
| Oat hay .....                | 8   | .34                   | 3.71                       | .12         |
| Corn and cob meal .....      | 5   | .22                   | 3.00                       | .14         |
| Bran .....                   | 2   | .24                   | .78                        | .05         |
| Cotton-seed meal .....       | 2   | .74                   | .34                        | .24         |
| <b>Total nutrients .....</b> |     | <b>2.25</b>           | <b>13.93</b>               | <b>.76</b>  |
| Nutritive ratio, 1:7.        |     |                       |                            |             |

## Ration J.

|                              | Lb. | Digestible Nutrients. |                            |             |
|------------------------------|-----|-----------------------|----------------------------|-------------|
|                              |     | Protein,<br>lb.       | Carbohy-<br>drates,<br>lb. | Fat,<br>lb. |
| Corn stover .....            | 10  | .17                   | 3.24                       | .07         |
| Cowpea hay .....             | 10  | 1.08                  | 3.86                       | .11         |
| Corn and cob meal .....      | 7   | .31                   | 4.20                       | .20         |
| Bran .....                   | 4   | .49                   | 1.57                       | .11         |
| <b>Total nutrients .....</b> |     | <b>2.05</b>           | <b>12.87</b>               | <b>.49</b>  |
| Nutritive ratio, 1:6.8.      |     |                       |                            |             |

The farmer should, as a rule, aim to raise the greater portion of the feed for his stock on the farm. Since rough feed is usually much cheaper than grain, too much importance cannot be placed on securing hay and fodder in the best possible condition. If hay is unduly exposed to dew and rain during the time of curing it loses much, both in nutrition and palatability. It is also important that hay and fodder be cut at the proper stage, before becoming too ripe and the stems woody.

Leguminous plants, (those bearing their seeds in pods or legumes,) as clover, alfalfa, cowpeas, beans, etc., are rich in protein and should be raised in sufficient quantities to supply the necessary protein for the stock. If the supply of protein is deficient some feed rich in that substance should be purchased to complete the ration.

Grain feed should not usually compose over half the ration, and from that to nothing, according to the character of the roughage available and amount of milk given by the cow. In general it is a safe rule to feed liberally on good roughage and vary the grain feed to suit the requirements of the individual.

When cows have luxuriant pasture during the late spring before the heat is excessive or the flies troublesome the conditions are as near ideal for dairy cows as it is easy to obtain. The nearer we can approach these conditions the year around the better for milk production. It is, therefore, essential to the best yields and most economical results that succulent food be provided for cows during the winter months. There are two ways of providing this succulent food—by silage and by root crops.

By comparing the results obtained at several different experiment stations it is found that corn commonly yields about twice as much nutrients per acre as do root crops. Since roots require much more hand labor, which is so expensive in this country, it is more economical for the Illinois farmer to get the succulent feed during the winter from corn silage than from root crops.

Silage is especially valuable on farms or in communities where rough feed is scarce, for more stock can be kept on a

given area of land where the crops are made into silage than in any way with the same amount of labor expended. No farmer keeping ten or more cows can afford to be without a silo.

#### Green Feed for Summer Drought.

Dairymen suffer greatly nearly every summer by not supplying proper green feed for their cows during the hot dry weather of midsummer. This shortage of feed comes at a very inopportune time since the cows are already beginning to feel the effect of the heat and flies which of themselves quite perceptibly lessen the flow of milk, and if feed is cut short at the same time the shrinkage is certain to be large, resulting in great loss, for it is practically impossible to restore the shrinkage during that period of lactation. A continuous supply of feed is equally essential to the successful maintainance of young and growing animals.

A pasture will carry much more stock during spring, early summer and fall than it will in the dry weather of midsummer. By helping it out during this season with partial soiling the cattle have better feed and more stock can be carried on a given area than by pasturing alone. Such crops should be planted as will mature in proper succession with each in its best stage of growth insuring a continuous supply of green feed during the dry season.

**Table 2.**  
**Crops for Partial Soiling During Midsummer.**

| Kinds of Fodder                | Amount of seed per acre | Approximate time of seeding | □ Approximate time of feeding |
|--------------------------------|-------------------------|-----------------------------|-------------------------------|
| 1. Corn—early, sweet or dent   | 6 quarts                | May 1                       | July 1—Aug. 1                 |
| 2. Corn—medium dent.....       | 5 quarts                | May 15                      | Aug. 1—Sept. 30               |
| 3. Cowpeas .....               | 1 bushel                | May 15                      | Aug. 1—Sept. 30               |
| 4. Soy beans.....              | 1 bushel                | May 15                      | Aug. 1—Sept. 15               |
| 5. Oats and Canada peas (each) | 1 bushel                | April 15                    | July 1—July 15                |
| 6. Oats and Canada peas (each) | 1 bushel                | May 1                       | July 15—Aug. 1                |
| 7. Rape (Dwarf Essex).....     | 4 pounds                | May 1                       | July 1—Aug. 1                 |
| 8. Rape, second sowing .....   | 4 pounds                | June 1                      | Aug. 1—Sept. 1                |
| 9. Rape, third sowing.....     | 4 pounds                | July 1                      | Sept. 1—Oct. 1                |

For central and southern Illinois there is no crop that will produce more feed to the acre than corn, and by planting a small quantity of an early variety with the general crop, corn may be

had in the proper condition for feeding from July 15 until frost. There are several early varieties that will mature for feeding in from sixty to seventy-five days planting. Corn should not be fed too young. When it is nearly full height it contains only one-third as much nutriment as when in the roasting ear.

Some other crop should be fed in connection with corn to balance the ration and afford variety. Leguminous crops as clover, Canada peas, cowpeas, soy beans, etc., are especially valuable for this purpose, being unusually rich in protein.

Cowpeas and soy beans give a large amount of valuable forage, furnishing feed from the first of August until frost. If more feed has been grown than can be fed green, it may be made into hay of excellent quality.

Oats and Canada peas yield well. They are not in condition to feed for more than two or three weeks but the supply may be lengthened by sowing at different dates. If a portion becomes too ripe it may be utilized by making it into hay.

If the pastures are short and no allowance has been made for green feed, corn cut from the regular crop, if it is near the roasting ear stage, will bring the best of returns. Never under any consideration allow the stock to go hungry and suffer the losses incident to shortened feed at a time which for every reason is the most trying to live stock.

Those who wish to study this subject further are referred to some of the standard books on feeding; among the best being "Feeds and Feeding" by Professor Henry, Director of the Agricultural Experiment Station, at Madison, Wisconsin; and "Feeding Farm Animals" by Dr. Jordon, Director of the Agricultural Experiment Station at Geneva, New York. The former gives a very complete description of the results of feeding investigations both in this country and abroad; the latter is a well written popular treatise upon the subject of feeding.



Table 3.

Average Amount of Digestible Nutrients in American Feeding Stuff,  
From Henry's "Feeds and Feeding."

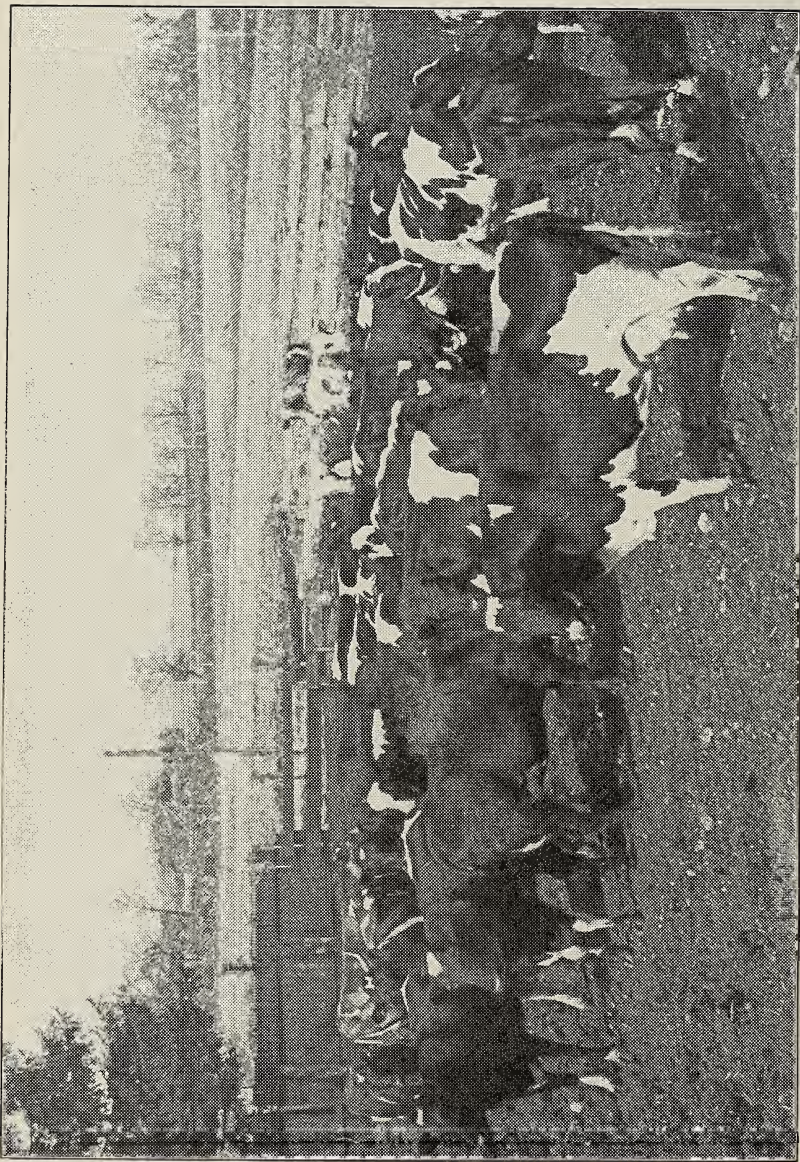
| Concentrates.                    | Digestible Nutrients in 100 lb. |                            |             |
|----------------------------------|---------------------------------|----------------------------|-------------|
|                                  | Protein,<br>lb.                 | Carbohy-<br>drates,<br>lb. | Fat,<br>lb. |
| Dent corn .....                  | 7.8                             | 66.7                       | 4.3         |
| Sweet corn .....                 | 8.8                             | 63.7                       | 7.0         |
| Corn and cob meal .....          | 4.4                             | 60.0                       | 2.9         |
| Corn bran .....                  | 7.4                             | 59.8                       | 4.6         |
| Gluten meal .....                | 25.8                            | 43.3                       | 11.0        |
| Germ meal .....                  | 9.0                             | 61.2                       | 6.2         |
| Grano-gluten .....               | 26.7                            | 38.8                       | 12.4        |
| Hominy chops .....               | 7.5                             | 55.2                       | 6.8         |
| Gluten feed .....                | 20.4                            | 48.4                       | 8.8         |
| Wheat .....                      | 10.2                            | 69.2                       | 1.7         |
| Wheat bran .....                 | 12.2                            | 39.2                       | 2.7         |
| Wheat shorts .....               | 12.2                            | 50.0                       | 3.8         |
| Wheat middlings .....            | 12.8                            | 53.0                       | 3.4         |
| Rye .....                        | 9.9                             | 67.6                       | 1.1         |
| Rye bran .....                   | 11.5                            | 50.3                       | 2.0         |
| Rye shorts .....                 | 11.9                            | 45.1                       | 1.6         |
| Barley .....                     | 8.7                             | 65.6                       | 1.6         |
| Brewers' grains, wet .....       | 3.9                             | 9.3                        | 1.4         |
| Brewers' grains, dried .....     | 15.7                            | 36.3                       | 5.1         |
| Oats .....                       | 9.2                             | 47.3                       | 4.2         |
| Oat feed or shorts .....         | 12.5                            | 46.9                       | 2.8         |
| Oat dust .....                   | 8.9                             | 38.4                       | 5.1         |
| Oat hulls .....                  | 1.3                             | 40.1                       | 0.9         |
| Buckwheat bran .....             | 7.4                             | 30.4                       | 1.9         |
| Buckwheat middlings .....        | 22.0                            | 33.4                       | 5.4         |
| Flax seed .....                  | 20.6                            | 17.1                       | 29.0        |
| Lindseed meal, old process ..... | 29.3                            | 32.7                       | 7.0         |
| Lindseed meal, new process ..... | 28.2                            | 40.1                       | 2.8         |
| Cotton seed .....                | 12.5                            | 30.0                       | 17.3        |
| Cotton-seed meal .....           | 37.2                            | 16.9                       | 12.2        |
| Cotton-seed hulls .....          | 0.3                             | 33.1                       | 1.7         |
| Peas .....                       | 16.8                            | 51.8                       | 0.7         |
| Soy bean .....                   | 29.6                            | 22.3                       | 14.4        |
| Cowpea .....                     | 18.3                            | 54.2                       | 1.1         |
| Horse bean .....                 | 22.4                            | 49.3                       | 1.2         |
| Roughage.                        |                                 |                            |             |
| Fodder corn, green .....         | 1.0                             | 11.6                       | 0.4         |
| Fodder corn, field-cured .....   | 2.5                             | 34.6                       | 1.2         |
| Corn stover, field-cured .....   | 1.7                             | 32.4                       | 0.7         |

|                                    | Digestible Nutrients in 100 lb. |                            |             |
|------------------------------------|---------------------------------|----------------------------|-------------|
|                                    | Protein,<br>lb.                 | Carbohy-<br>drates,<br>lb. | Fat,<br>lb. |
| Fresh Grass.                       |                                 |                            |             |
| Pasture grasses (mixed) .....      | 2.5                             | 10.2                       | 0.5         |
| Kentucky blue grass .....          | 3.0                             | 19.8                       | 0.8         |
| Timothy, different stages .....    | 1.2                             | 19.1                       | 0.6         |
| Orchard grass, in bloom .....      | 1.5                             | 11.4                       | 0.5         |
| Redtop, in bloom .....             | 2.1                             | 21.2                       | 0.6         |
| Oat fodder .....                   | 2.6                             | 18.9                       | 1.0         |
| Rye fodder .....                   | 2.1                             | 14.1                       | 0.4         |
| Sorghum .....                      | 0.6                             | 12.2                       | 0.4         |
| Meadow fescue, in bloom .....      | 1.5                             | 16.8                       | 0.4         |
| Hungarian grass .....              | 2.0                             | 16.0                       | 0.4         |
| Green barley .....                 | 1.9                             | 10.2                       | 0.4         |
| Peas and oats .....                | 1.8                             | 7.1                        | 0.2         |
| Peas and barley .....              | 1.7                             | 7.2                        | 0.2         |
| Hay.                               |                                 |                            |             |
| Timothy .....                      | 2.8                             | 43.4                       | 1.4         |
| Orchard grass .....                | 4.9                             | 42.3                       | 1.4         |
| Redtop .....                       | 4.8                             | 46.9                       | 1.0         |
| Kentucky blue grass .....          | 4.8                             | 37.3                       | 2.0         |
| Hungarian grass .....              | 4.5                             | 51.7                       | 1.3         |
| Mixed grasses .....                | 5.9                             | 40.9                       | 1.2         |
| Meadow fescue .....                | 4.2                             | 43.3                       | 1.7         |
| Soy-bean hay .....                 | 10.8                            | 38.7                       | 1.5         |
| Oat hay .....                      | 4.3                             | 46.4                       | 1.5         |
| Straw.                             |                                 |                            |             |
| Wheat .....                        | 0.4                             | 36.3                       | 0.4         |
| Rye .....                          | 0.6                             | 40.6                       | 0.4         |
| Oat .....                          | 1.2                             | 38.6                       | 0.8         |
| Barley .....                       | 0.7                             | 41.2                       | 0.6         |
| Fresh Legumes.                     |                                 |                            |             |
| Red clover, different stages ..... | 2.9                             | 14.8                       | 0.7         |
| Alsike, bloom .....                | 2.7                             | 13.1                       | 0.6         |
| Crimson clover .....               | 2.4                             | 9.1                        | 0.5         |
| Alfalfa .....                      | 3.9                             | 12.7                       | 0.5         |
| Cowpea .....                       | 1.8                             | 8.7                        | 0.2         |
| Soy bean .....                     | 3.2                             | 11.0                       | 0.5         |
| Legume Hay and Straw.              |                                 |                            |             |
| Red clover, medium .....           | 6.8                             | 35.8                       | 1.7         |
| Red clover, mammoth .....          | 5.7                             | 32.0                       | 1.9         |
| Alsike clover .....                | 8.4                             | 42.5                       | 1.5         |
| White clover .....                 | 11.5                            | 42.2                       | 1.5         |
| Crimson clover .....               | 10.5                            | 34.9                       | 1.2         |

|                                    | Digestible Nutrients in 100 lb. |                            |             |
|------------------------------------|---------------------------------|----------------------------|-------------|
|                                    | Protein,<br>lb.                 | Carbohy-<br>drates,<br>lb. | Fat,<br>lb. |
| Alfalfa .....                      | 11.0                            | 39.6                       | 1.2         |
| Cowpea .....                       | 10.8                            | 38.6                       | 1.1         |
| Soy-bean straw .....               | 2.3                             | 40.0                       | 1.0         |
| Pea-vine straw .....               | 4.3                             | 32.3                       | 0.8         |
| Silage.                            |                                 |                            |             |
| Corn .....                         | 0.9                             | 11.3                       | 0.7         |
| Clover .....                       | 2.0                             | 13.5                       | 1.0         |
| Sorghum .....                      | 0.6                             | 14.9                       | 0.2         |
| Alfalfa .....                      | 3.0                             | 8.5                        | 1.9         |
| Grass .....                        | 1.9                             | 13.4                       | 1.6         |
| Cowpea vine .....                  | 1.5                             | 8.6                        | 0.9         |
| Soy bean .....                     | 2.7                             | 8.7                        | 1.3         |
| Barnyard millet and soy bean ..... | 1.6                             | 9.2                        | 0.7         |
| Corn and soy bean .....            | 1.6                             | 13.0                       | 0.7         |
| Roots and Tubers.                  |                                 |                            |             |
| Potato .....                       | 0.9                             | 16.3                       | 0.1         |
| Beet, sugar .....                  | 1.1                             | 10.2                       | 0.1         |
| Beet, mangel .....                 | 1.1                             | 5.4                        | 0.1         |
| Flat turnip .....                  | 1.0                             | 7.2                        | 0.2         |
| Rutabaga .....                     | 1.0                             | 8.1                        | 0.2         |
| Carrot .....                       | 0.8                             | 7.8                        | 0.2         |
| Parsnip .....                      | 1.6                             | 11.2                       | 0.2         |
| Artichoke .....                    | 2.0                             | 16.8                       | 0.2         |
| Miscellaneous.                     |                                 |                            |             |
| Cabbage .....                      | 1.8                             | 8.2                        | 0.4         |
| Pumpkin, field .....               | 1.0                             | 5.8                        | 0.3         |
| Pumpkin, garden .....              | 1.4                             | 8.3                        | 0.8         |
| Prickly comfrey .....              | 1.4                             | 4.6                        | 0.2         |
| Rape .....                         | 1.5                             | 8.1                        | 0.2         |
| Dried blood .....                  | 52.3                            | .0                         | 2.5         |
| Meat scrap .....                   | 66.2                            | .3                         | 13.7        |
| Beet pulp .....                    | 0.6                             | 7.3                        | ...         |
| Beet molasses .....                | 9.1                             | 59.5                       | ...         |
| Cow's milk .....                   | 3.6                             | 4.9                        | 3.7         |
| Cow's milk, colostrum .....        | 17.6                            | 2.7                        | 3.6         |
| Skim milk, gravity .....           | 3.1                             | 4.7                        | 0.8         |
| Skim milk, centrifugal .....       | 2.9                             | 5.2                        | 0.3         |
| Buttermilk .....                   | 3.9                             | 4.0                        | 1.1         |
| Whey .....                         | 0.8                             | 4.7                        | 0.3         |







For profit

1 of these cows equals 19 of the other herd.  
10 of this kind equals 190 of the other herd.  
20 of this kind equals 380 of the other herd.  
40 of this kind equals 760 of the other herd.  
80 of this kind equals 1520 of the other herd.



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**DIFFERENCE IN HERDS AND INDIVIDUALS.**

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By W. J. Fraser, Chief of Dairy Husbandry, University of Illinois.

As there is a difference in men in their character and earning power, so there is a difference in dairy herds of cattle found on Illinois farms. The difference in the herds is likely to correspond to the difference in the men. This is admitted as self-evident but perhaps without attaching much importance to the statement. But probably few people have studied these differences enough to appreciate their extent. For instance, would we think, without special investigation, that one herd of cows costing only a third more than another herd, may bring the owner three times, or five times, or even ten times as much clear profit? Is it clearly understood that some Illinois herds do not pay for the feed given them? That other herds pay too small a margin of profit to justify the investment in money and labor? And that still other herds are making their owners big money? Do dairymen, in general, know that these differences rest on plain causes that may be understood, and that a change from the poor herd to the highly profitable herd is a comparatively easy matter within the reach of any farmer who is able to keep cows at all? For answer, look at the following facts personally known to members of this department.

The cuts here shown illustrates a wide difference in two herds in the same locality in this state. Isn't the one a most beautiful herd? But there is a deeper difference than that. A little study of the individuals shows that handsome cattle have a better dairy form and are in higher condition. It wouldn't be hard to make choice between herds, just on their looks. And the cows themselves, as seen recently by the writer, show a much greater difference than do these pictures. But the figures of their production, their profits to the farmer, tell a story that pales all these apparent differences into insignificance and forever puts an impassable gulf between these two herds—and the two kinds of cows they represent.

#### Comparison in Milk Production.

The cows in the better herd were picked up here and there at moderate prices. They have been producing milk throughout the year at the rate of 18 cans to 45 cows or  $2\frac{1}{2}$  cows to a can (8 gallons). The latter herd has been yielding at the rate of 5 1-3 cans to 34c ows or 6.4 cows to the can.

When milk sells at \$1.15 per 100 pounds, this means that the average cow in the better herd produces 29 1-2c worth of milk per day or \$88.50 worth as the total for a year of ten months. The poorer herd yields 111-2 c worth of milk per cow per day or \$34.50 worth for the year. There is some difference between these cows and their incomes.

If it cost \$32 per cow for feed in the poorer herd, just \$2.50 per head is left as the profit for one year. But if the better herd is fed at \$40 per cow, it leaves \$48.50 per head as profit. Here is a difference of \$46 in clear gain, or in other words, it takes 19 cows of the one kind to equal one cow of the other kind. In a herd of 40 cows, this difference would amount to \$1,840.

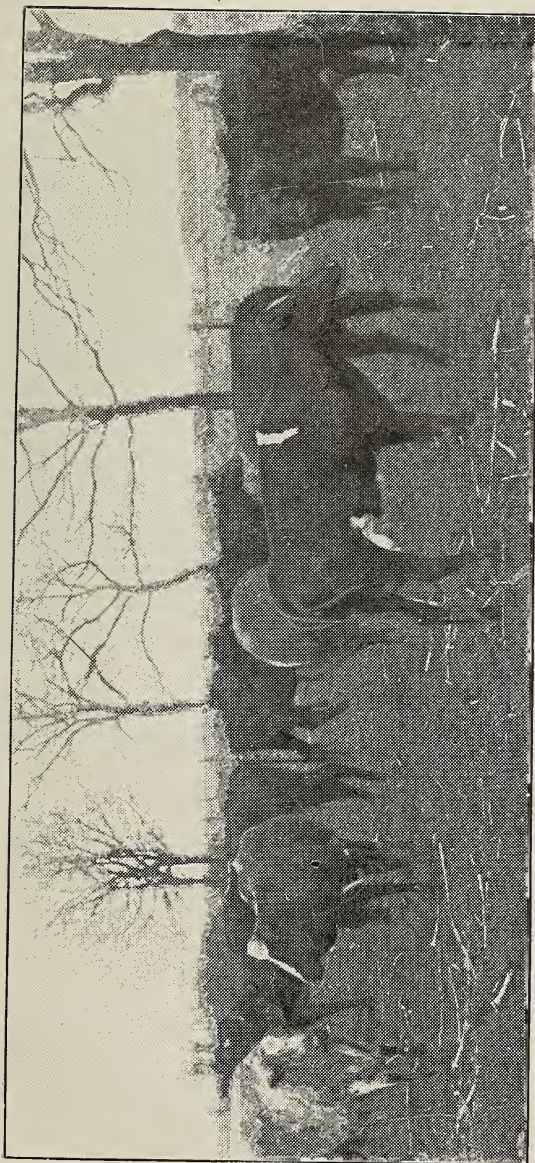
If a man desired to make \$1,000 per year profit in the dairy business, he would have to keep 400 of these poor producers. But he would get the same results with 21 cows like those in the better herd. Truly there is a large and vital difference between these two herds, and one that no dairyman can afford to overlook.

These estimates are conservatively made from the facts known, and do not yet represent the widest extremes in Illinois dairy conditions. It is altogether probable that this poorer herd is kept at an actual loss, and quite possible that the better herd makes more money than is here credited to it.

#### Comparison of Six Herds with Six Herds.

Eighteen dairy herds in another part of the state were tested by this station. For one year. the average production of the best six herds was 280.5 pounds butterfat per cow, and of the poorest six herds 172.7 pounds.

Counting the butterfat at 25c per pound, the best herds made an income of \$70.13 per cow, and the poorest \$43.18. Here



19 of these cows equals 1 of the other herd.  
190 of this kind equals 10 of the other herd.  
380 of this kind equals 20 of the other herd.  
760 of this kind equals 40 of the other herd.  
1520 of this kind equals 80 of the other herd.





is an average difference of \$26.95 per cow. In a herd of fifty, this would amount to \$1,347.50.

Granting that it costs \$32 per cow to feed the poorest herds, and \$40 per cow to feed the best herds, the net profit would average \$11.18 in the former, and \$30.13 in the latter. That is, every cow in the best herds earned nearly three times as much money for the farmer as did the average cow in the poorest herds. Which kind is the best to keep .

To return the dairyman a profit of \$1,000 per year, would require ninety cows like those in the poorest herds, but only thirty-four of the kind in the best herds. Thirty-four of the best kind at \$55 would cost \$1,780, but ninety of the other kind at \$35 would cost \$3,150, requiring an investment of \$1,280 more than for an equal herd of the best cows. It is easy to see that it would take more labor and more men to feed and milk ninety cows than it would to care for thirty-four. The ninety poor cows would consume \$2,880 worth of feed, and the thirty-four good ones \$1,360 worth—\$1,520 in favor of the good cows. Which kind is the more economical?

The average cow in the best herd makes an annual income of \$87.54 and at \$40 for feed, a profit of 47.54. While the average cow in the poorest herd makes an income of \$35.51 and at \$32 for feed, a profit of \$3.51. Here is a difference in profit of \$44.03 per cow, and it takes 131-2 cows of the one kind to make their owner as much clear money as one cow of the other kind. To make \$1,000 profit per year would require a herd of 285 cows like those of the poorest herd, or just 22 cows like those of the best herd. Which kind should the dairyman build up.

The estimates of these twelve herds take note of only the feed and the butterfat. The calf, the skim milk, and the manure, will certainly pay for the labor and the interest on investment.

These figures of really representative dairy herds must mean something to the thoughtful farmer. The herd of low produc-



tion and the individual cows that do not return the owner a net profit of \$12 or \$15 per year--and their name in Illinois is legion--scarcely justify his investment of money, time, and labor in keeping them. A study of these herds shows that the economical thing to do is to sell the poor cows to the butcher as fast as they can be replaced with better producers. The latter can be accomplished either by more judicious buying or by raising the heifer calves of high-producing mothers, mated to a pure-bred sire having a line of such mothers in his ancestry. This is not so difficult to do when once the dairyman sets his standard of a cow, determines definitely what kind of a cow he will buy or produce, and goes after that cow instead of taking something else that may be cheaper or easier to get. The greatest practical difficulty is in discovering which cows are poor and how poor they are. This is quite easily done—in just one way—by weighing and testing the milk of each cow often enough throughout the milking period to get a fair estimate of her worth. Scales and a Babcock test cost but a few dollars and their use may easily lead to an improvement of the herd, that will add hundreds to profit annually. Should not every dairyman ask (and answer) the question, "On which side of the profit line—and how far from it—is my herd and every individual in it?"

#### Comparison of Individuals.

Here at the experiment station are two cows, the story of whose work is worth telling wherever cows are kept. They were both bought for good producers but they didn't turn out alike. In fact, their progress has been in opposite directions, and yet it is hard to tell which has the more valuable message to Illinois dairyman.

These animals are neither freaks nor creations of the college, and they have not been abnormally developed to produce different results. They were brought up alike on the farm and obtained their early education in the same herd of 100 cows in the Elgin region. Here at the university, with the same identical surround-

ings and equal opportunities, they have drifted far apart in character.

It is not a difference of hide or horns or temper; not that one is wild and the other a pet; it is not a difference of beauty or intelligence or morals. The only difference worthy of note is a difference in work in earning money for the owner. Here is how they differ.

#### The Two Records for Three Years.

The milk of each of these cows has been weighed and tested and an exact record of its amount and quality kept for the whole period, and every pound of the feed consumed by each cow both summer and winter has been set down in definite terms.

During the past three years cow No. 1 has produced 34,171 pounds milk containing 1,214 pounds butterfat, and cow No. 2 in the same time has yielded but 11,491 pounds milk with 414 pounds butterfat. This makes the annual production of the one 11,390 pounds of milk and 404 2-3 pounds fat; and of the other 3,830 pounds milk and 138 pounds butterfat.

These cows were cared for in the same way and given the same kinds of feed and encouraged to eat all they could make good use of. Cow No. 1 ate 1.56 times as much as cow No. 2, but produced 2.97 times as much milk and 2.93 times as much butterfat. Or reduced to a like feed basis, No. 1 produced 1.88 times as much as No. 2.

#### 259 vs. 138 lbs. Fat on the Same Feed.

Feed fed to No. 1 produced 1.88 times as much butterfat as when fed to No. 2, that is equal amounts of feed made 188 pounds fat when fed to No. 1, but only 100 pounds when fed to No. 2. Each year, No. 2 got only 138 pounds butterfat from the same quantity of food that No. 1 changed into 295 pounds fat. The one cow is nearly twice as good a producer as the other on exactly the same feed.

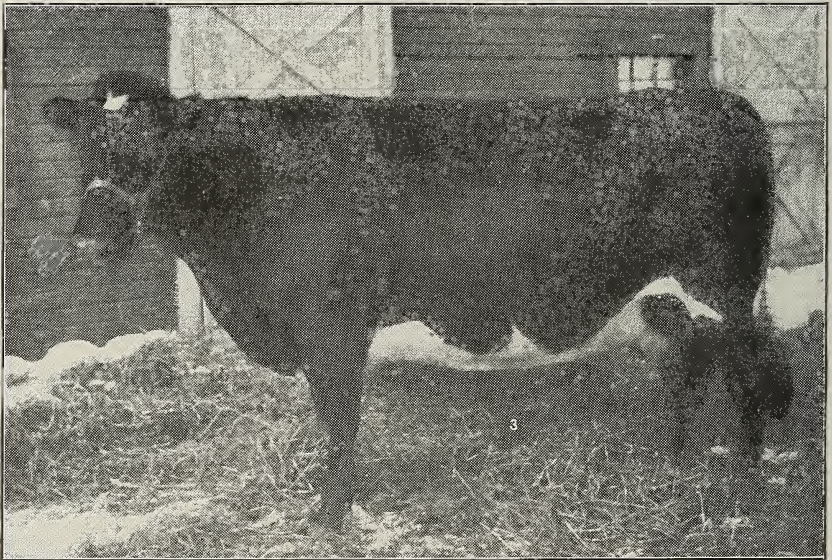
This sounds significant. It gives a big hint as to the kind of cows to keep. But it represents only the parting of the ways. Let us follow these cows further. What does this difference mean

to the practical farmer keeping such cows for the money there is in it?

**\$42.60 Profit vs. \$2.86 Loss.**

Counting the butterfat at 25c per pound, one cow returns \$101.16 and the other \$34.50 per year. Taking out the known and exact cost of feed in each case, the one cow brings in a clear profit of \$42.60 per year, and the other lacks \$2.86 of paying for her board at market prices of feed.

Forty such cows as No. 1 would return a dairyman a clear



Cow No. 1.—Average record for three years, 11,390 lbs. milk; 405 lbs. butterfat. From the same feed this cow produced 1.88 times as much butterfat as cow No. 2. Returns a clear profit of \$42.60 per year.

profit of \$1,704 per year, and a herd of eighty would make him \$3,408 above all expenses. The latter is a very good stroke of business to do with a herd that could be maintained on 200 acres of good land.



### The Embarrassing Cow.

But what about cow No. 2? Her record embarrasses the situation (and it would embarrass the dairyman owning her too). If she had made \$2.86 profit, there would be at least something to compare with. Then it would only take fifteen such to equal a single cow like No. 1. But No. 2 didn't do it. It was \$2.86 loss instead of profit. For profit in milk production, a thousand or million such cows would not equal one of the other kind. Here is where numbers don't count, or rather where they count in



Cow No. 2.—Average record for three years, 3,830 lbs. milk; 138 lbs. butterfat. Lacked \$2.86 per year of earning her board. Fifty-two as poor as she found in eighteen Illinois dairy herds.

the wrong direction. This is one of the few places that algebra comes in; the comparison, if any, must deal with a minus side.

#### It Means Two Farms or No Farm.

The man with eighty cows like No. 1 could clear up enough

money in ten years to buy another farm of 200 acres (at \$100 per acre) and have more than the price of a third such farm to go into family expenses and improvements. But his neighbor, with a herd of eighty cows like No. 2, losing \$229 every year and having to pay out of pocket all the expenses of living would, within the decade, have his farm well plastered with mortgages with the probability of losing it all. Indeed, fully as striking a contrast as this is known to the writer as having actually taken place in a certain dairy neighborhood of Illinois.

While the contrast between these two cows is striking, it is in accord with the actual facts, and being complete and accurate for a three-year period, and including the feed as well as the milk record, it means a great deal more than a single year's comparison or a comparison in which it is necessary to introduce an "if" or an unmeasured element. Only the feed and butterfat are here considered. It is figured that the calf, the skim milk, and the manure are well worth the labor and the interest on investment.

#### **It's All Over the State Too.**

A single instance or a few exceptional cases of this kind wouldn't mean much. But the writer knows from actual testing of 800 cows in forty different herds that there must be thousands of individual contrasts as great or greater than this in the dairy herds of Illinois, and to indicate how widely such differences in production enter into the practical business of dairying, the following additional data is given.

In eighteen dairy herds, in one section of Illinois, containing 323 cows of which this station made a full year's individual test and record, there were fifty-two cows, every one of which was as poor or poorer a producer than No. 2 (the highest yielding only 138 pounds butterfat), and there were forty-three that produced 280 or more pounds butterfat each.

#### **Fifty Cows Average Only 116 lbs. Fat.**

The poorest fifty cows in this 323 average only 116 3-5 pounds butterfat for the year, while the best fifty averaged 319



pounds butterfat. The best fifty produced 273 pounds fat for every 100 pounds produced by the poorest fifty—a difference of nearly three to one.

Several other cows in these herds produced but little above the poorest fifty, their clear profit if any, under any possible system of feeding, being too small for a dairyman to afford to keep them. So the profitless cow is seen to be a real and living issue of large proportion in dairying for bread and butter. Fourteen of the eighteen herds had cows as poor as No. 2, and there were from one to twelve of these poor cows in each herd.

#### **More Nearly the Same Feed.**

The feed of these cattle cannot be stated so exactly as in the other case. But it is known that on the average they were kept much cheaper on the farm than were the two university cows (which were not turned to pasture,) and also that as a rule no chance was given for such a difference in the cost of feed as between No. 1 and No. 2. Observing and inquiring into methods of feeding on many farms, indicate that few dairymen actually give one cow much advantage over another in feed. So this difference in production may easily mean a difference in profit still wider than that between No. 1 and No. 2. The record here is only for one year, but the hundred cows involved tend to keep the average representative.

#### **The Difference is \$50 Per Cow.**

Computing the butterfat at 25c a pound, as in the other case, the poorest fifty cows made an average return of \$29.15 and the best a return of \$79.75. The feed of a cow is seldom estimated lower than \$30 per year and it may go much higher even on the farm. It is seen at a glance that there is no money whatever in the one class of cows and that there is very good money in the other class.

#### **The Cow and the Tiger.**

The above data are representative of actual conditions in Illinois. One of the greatest and easiest steps of improvement in

the dairy business today is to discover and weed out these poor cows. The butcher will take them, and he is the only man who can get any money out of them.

The only farm that is able to keep this kind of cattle is—the poor farm, and the farmer who keeps them is headed for the same place. The only excuse for boarding No. 2's that is not a reflection on the owner is misguided charity.

Many dairymen would just as soon think of hunting for tigers in Illinois as for profitless cows, and would be just as much surprised to find such a cow as to come upon a "man eater". These cows may not carry off our children but they will take the bread out of their mouths.

#### How to Hunt Them.

Within sight from almost every rise of ground and barnyard gate, these presuming bovines walk forth unchallenged to pasture and plenty. And there is nobody to inquire what return they make. They "make a hand" easily enough in chewing grass and licking up bran and corn meal, but they do no udder business.

The biggest game in Illinois today is this same profitless cow. The only weapons required to bring her down—and the only ones that will—are the scales and Babcock test. Isn't it time to stop guessing at these vital elements in the profit of the dairy business and to find out for sure —by weighing and testing the milk—what each individual cow is earning for the owner?

## MEETING OF DIRECTORS.

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Directors of Illinois Dairymens Association met in the Coliseum, Chicago, Feb. 20, 1906. President Wiggins and Directors Mason, Wilson, Youngs, Spies and Campbell, Treasurer Coolidge and Secretary Caven, were present.

Ex-President Newman in a short address introduced the new president, L. N. Wiggins.

Then the regular business was proceeded with and reports of the business of the year were read by Treasurer Coolidge and Secretary Caven. Their reports were not complete, the business of the year not being entirely closed, so they were referred to a committee consisting of Joseph Newman and J. P. Mason of Elgin to be approved by them when completed and prior to being incorporated in the associations annual report.

The directors, on proceeding with the election of a treasurer and secretary re-elected John Coolidge of Galesburg, treasurer and Geo. Caven of Chicago, secretary.

The matter of an assistant food commissioner of Illinois was brought up and it was suggested that the directors take some action toward getting, as the law requires, an expert dairyman for that position. It was moved and seconded that a committee of three be appointed to suggest names to the governor for the position; also to select a man to be appointed an inspector in the food department, this man to have special charge of feeds as required by the law passed at the last session of the legislature and relating to stock feed. The names on this committee are J. P. Mason of Elgin, E. L. Wilson of Manhattan and H. J. Youngs of Stillman Valley.

It was duly moved and carried that the president and sec-

retary be instructed to carry out the wishes of the association as expressed at Effingham having the incorporated name of the association changed so as to include the word state and read Illinois State Dairymen's Association.

It was moved and carried that the president appoint a committee of three who, with himself and the secretary, should decide upon the time and place for the next annual convention. The three members appointed are Messrs. Wilson, Youngs and Spies.

#### REPORT OF SECRETARY CAVEN.

Directors Illinois State Dairymen's Association.

I herewith submit the report of money received and paid out by me as secretary in the work of the association for the year 1905-06 just closed.

The receipts from the last convention are all in and the bills paid. In preparing for the convention we printed and circulated over the state 1000 programs. A copy was sent to each creamery of which we had the address, and as many dairymen as we could get addresses of. All but about one hundred of the programs were mailed out prior to the convention. We printed and sent out 800 posters announcing the convention; a letter of announcement was also sent out to members and other dairymen and for six weeks prior to the convention an article was mailed out to weekly and daily newspapers, mainly in the central and southern part of the state, the territory nearest to the meeting place. Besides we mailed out 275 copies of the annual report at 11 cents each. Your secretary made three trips to Effingham preparing for the convention and these two items, stamps and traveling expenses are the two largest bills of expense. The total receipts are \$783.87 and expenses \$256.56.

**Expenses.**

|   |          |
|---|----------|
| Stamps .....                                  | \$55.70  |
| Express, freight, cartage .....               | 16.43    |
| Traveling expense .....                       | 62.53    |
| Envelopes .....                               | 9.05     |
| Cuts for report .....                         | 9.65     |
| Telephone and Telegrams .....                 | 3.20     |
| Printing, folding etc. ....                   | 7.50     |
| Labor .....                                   | 5.50     |
| Miscellaneous .....                           | 4.00     |
| Stereoptican .....                            | 6.00     |
| To Gen. Wilcox .....                          | 12.50    |
| Hotel Effingham (speakers and officers) ..... | 64.50    |
|   | <hr/>    |
| Total   | \$256.56 |

**Paid to Treasurer Coolidge.**

|               |          |
|---------------|----------|
| Jan. 12 ..... | \$ 20.00 |
| Jan. 22 ..... | 204.00   |
| Jan. 31 ..... | 122.51   |
| Feb. 1 .....  | 50.00    |
| Feb. 8 .....  | 70.00    |
| Feb. 9 .....  | 10.00    |
| June 30 ..... | 50.80    |
|               | <hr/>    |
|               | \$783.87 |



## Receipts.

|   |              |
|---|--------------|
| By check from Treasurer .....           | \$ 50.00     |
| By check from Treasurer.....            | 40.00        |
| Colonial Salt Co.,.....                 | 10.00        |
| Diamond Crystal Salt Co.,.....          | 10.00        |
| Memberships .....                       | 149.00       |
| Effingham .....                         | 200.00       |
| John Newman Co. (butter sold).....      | 12.51        |
| Elgin Butter Tub Co., .....             | 10.00        |
| De Laval Separator Co.,.....            | 35.00        |
| Creamery Package Mfg. Co.,.....         | 25.00        |
| Sharples Separator Co., .....           | 20.00        |
| A. H. Barber Creamery Supply Co., ..... | 10.00        |
| National Creamery Supply Co., .....     | 10.00        |
| Lisbon Mutual Insurance Co., .....      | 10.00        |
| J. B. Ford Co. ....                     | 20.00        |
| Wells and Richardson Co., .....         | 20.00        |
| Blanke & Hauk .....                     | 10.00        |
| Sale of Butter.....                     | 62.16        |
| D. H. Burrell & Co.,.....               | 10.00        |
| Francis D. Moulton & Co.....            | 10.00        |
| Heller & Merz .....                     | 20.00        |
| Vermont Farm Machine Co., .....         | 20.00        |
| S. D. Childs & Co., (refund).....       | .20          |
| Worcester Salt Co., .....               | 10.00        |
| Empire Cream Separator Co., .....       | 10.00        |
| <br>Total .....                         | <br>\$783.87 |

Approved — J. N. Newman and J. P. Mason, Auditing Committee.

## REPORT OF TREASURER COOLIDGE.

To the Board of Directors of the Illinois Dairymens Ass'n.

## Receipts.

|              |                            |           |
|--------------|----------------------------|-----------|
| Aug. 1, 1905 | To Cash on hand            | \$211.81  |
|              | To Joseph Newman, State Ap | 1,500.00  |
| 1906         |                            |           |
| Jan. 13      | To Geo. Caven, Sec.        | 20.00     |
| Jan. 23      | To Geo. Caven, Sec.        | 204.00    |
| Feb. 1       | To Geo. Caven, Sec.        | 122.51    |
| Feb. 2       | To Geo. Caven, Sec.        | 50.00     |
| Feb. 9       | To Geo. Caven, Sec.        | 70.00     |
| Feb. 12      | To Geo. Caven, Sec.        | 10.00     |
| July 1       | To Geo. Caven, Sec.        | 50.80     |
|              | Total Receipts             | \$2239.12 |

## Disbursements.

|         |                             |           |
|---------|-----------------------------|-----------|
| 1905    |                             |           |
| Aug. 29 | Lowrie & Black, No. 888     | \$ 17.70  |
| Oct. 16 | Geo. Caven, No. 889         | 100.00    |
| Oct. 31 | Joseph Newman, No. 890      | 12.70     |
| Oct. 31 | Geo. Caven, No. 891         | 50.00     |
| Dec. 5  | W. R. Kimsey, No. 892       | 15.80     |
| Dec. 5  | M. Long, No. 893            | 13.79     |
| Dec. 5  | Geo. Caven, No. 894         | 40.00     |
| Dec. 20 | Chicago Prod. Co., No. 896  | 32.00     |
| 1906    |                             |           |
| Jan. 11 | Elgin Dairy Report, No. 897 | 51.00     |
| Jan. 11 | S. D. Childs & Co., No. 898 | 30.15     |
| Feb. 6  | Lowrie & Black, No. 905     | 720.73    |
| June 25 | Joseph Newman, No. 899      | 14.00     |
|         | Total Frd.                  | \$1097.87 |

| Amounts Frd.                              | Receipts  | Expenditures |
|---|-----------|--------------|
|   | \$2239.12 | \$1097.87    |
| June 29 M. S. Campbell, No. 900.....      |           | 18.99        |
| June 29 Colan C. Little, No. 902.....     |           | 29.48        |
| June 29 Geo. Caven, No. 903.....          |           | 100.00       |
| June 29 J. R. Biddulph, No. 904.....      |           | 36.23        |
| Feb. 6 D. McIntosh, No. 906.....          |           | 3.39         |
| Feb. 6 C. E. Lee, No. 912.....            |           | 6.87         |
| Feb. 6 C. N. Kennard, No. 913.....        |           | 20.80        |
| Feb. 6 Reed Johnson, No. 914.....         |           | 20.76        |
| Feb. 6 Geo. Simonsen, No. 915.....        |           | 8.00         |
| Feb. 6 C. Christenson, No. 916.....       |           | 20.00        |
| Feb. 6 T. E. Smazes, No. 918.....         |           | 5.45         |
| Feb. 6 W. H. Welch, No. 919.....          |           | 13.00        |
| Feb. 6 O. E. Holland, No. 920.....        |           | 2.00         |
| Feb. 6 Geo. Bloyer, No. 921.....          |           | 3.00         |
| Feb. 6 F. J. Muller, No. 923.....         |           | 3.00         |
| Feb. 6 Geo. W. Hoppensteadt, No. 925..... |           | 14.00        |
| Feb. 6 W. J. Becker, No. 926.....         |           | 12.00        |
| Feb. 6 Louis Johnson, No. 928.....        |           | 14.45        |
| Feb. 6 Peter Nelson, No. 929.....         |           | 25.50        |
| Feb. 6 A. Maule, No. 930.....             |           | 16.00        |
| Feb. 6 H. H. Burthein, No. 932.....       |           | 12.00        |
| Feb. 6 T. W. Marquardt, No. 934.....      |           | 6.00         |
| Feb. 6 H. R. Duell, No. 936.....          |           | 8.00         |
| Feb. 6 T. G. Austin, No. 937.....         |           | 10.00        |
| Feb. 9 G. W. Ingersol, No. 940.....       |           | 4.50         |
| Feb. 9 Elgin Dairy Report, No. 941.....   |           | 1.25         |
| Feb. 9 W. J. Gillett, No. 942.....        |           | 27.55        |
| Feb. 9 John Coolidge, No. 943.....        |           | 27.50        |
| Feb 20 Geo. C. Humphrey, No. 901.....     |           | 14.08        |
| Feb. 23 W. J. Frazer, No. 907.....        |           | 3.14         |
| Feb. 30 F. A. Jorgenson, No. 908.....     |           | 5.09         |
| Feb. 21 H. A. Hopper, No. 909.....        |           | 6.00         |
| Feb. 23 C. C. Hayden, No. 910.....        |           | 3.24         |

|   |        |
|---|--------|
| March 17 J. M. Trueman, No. 911.....      | 3.19   |
| March 20 P. J. Springsteen, No. 922.....  | 18.00  |
| March 20 E. H. Coulson, No. 924.....      | 7.00   |
| March 20 F. J. Dickenson, No. 927.....    | 7.00   |
| March 20 Alice M. Sooksley, No. 931.....  | 25.00  |
| March 20 Anton Buller, No. 935.....       | 15.00  |
| March 20 E. Emma Higonboth, No. 944.....  | 87.80  |
| March 20 N. P. Hull, No. 945.....         | 21.88  |
| March 20 Walter R. Kimzey, No. 946.....   | 10.10  |
| March 20 L. A. Spies, No. 947.....        | 33.25  |
| March 20 J. P. Mason, No. 948.....        | 17.89  |
| March 20 C. T. Stone, No. 949.....        | 20.00  |
| March 20 L. N. Wiggins, No. 950.....      | 43.40  |
| March 20 Jno. Coolidge, No. 951.....      | 15.00  |
| March 20 M. S. Campbell, No. 952.....     | 10.08  |
| March 20 The Le Crone Press, No. 953..... | 6.50   |
| Cash on hand .....                        | 298.89 |

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Total .....\$2,239.12

Respectfully,

JNO. COOLIDGE, Treasurer.

Approved—J. N. Newman and J. P. Mason, Auditing  
Committee.

## The Effingham County Dairymen's Association.

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The Effingham County Dairymen's Association was organized in the spring of 1905. The first meeting was held in the court house in Effingham on March 25th, 1905. At this meeting the following officers were elected to hold office one year :

Anton F. Jansen, President; Dr. J. B. Walker, Vice President; F. G. Austin, Secretary, and Henry W. Dust, Treasurer.

At this meeting a committee was appointed to draft a constitution and by-laws to be adopted by the association for its government, which committee consisted of the following members: W. J. Jutkins, Henry Aulenbrock, J. H. Loy, Dr. J. B. Walker, and Wm. Wachtel. This committee made its report at a meeting held at the same place on Saturday, April 29th, 1905. and a constitution and by-laws were adopted very similar to those governing the Illinois State Dairymen's Association. Thirty-four members were enrolled at this meeting at our annual membership fee of 50 cents. The membership of the association was gradually increased to sixty-two members. The objects of the association are principally educational. First, To teach the farmers that they need better cows. Second, The proper kinds of feeds to feed and how to feed them. Third, To keep tab on the feed dealer so he can not charge unreasonable profits on feed, and on the milk market so that the farmer will know whether or not he is receiving the right price for his milk. And now for the results. It was through this association and the help of Mr. L. A. Spies that the annual meeting of the Illinois State Dairymen's Asso-



ciation was secured for Effingham, and was held in Austin opera house in Effingham on January 16th, 17th and 18th, 1906. The farmers took a great interest in the meeting of the State Association and attended the sessions in large numbers, and the benefits they derived from the meeting can be seen on every hand even at this early date—in better cows, better barns, and I understand that thirteen or fourteen silos have been shipped to farmers in Effingham and will be ready for the corn this fall. Five years ago there were very few thoroughbred dairy cows of any breed in our county. Now there are thirty or forty registered Holstein-Friesian sires at the head of as many herds. There are four thoroughbred registered Holstein-Friesian herds of from ten to twenty cows and twenty-five or thirty more herds that have from one to five registered cows in them and many others that contain grades.

Through our local association we have been able the past year to buy feed at the minimum. We have bought and sold to our members since last fall eleven car loads of bran at a saving of from ten to fifteen cents per hundred pounds to the farmer.

At a recent meeting it was figured that the association had saved the farmer of this community from \$1,600 to \$2,000 on feed within eight to ten months, with the result that the farmers are feeding more grain than they could afford to feed at the higher prices. It was also through this local association, at two meetings, one held on September 23rd, 1905, and the other on October 21st, 1905, which were attended by from one hundred and fifty to two hundred farmers, that a very satisfactory understanding was arrived at, between the farmers producing milk and the buyers, regarding the prices to govern and what would be required of the producers by the buyers. The association is in good running order and we believe will continue to be of great benefit to the farmers and community.

F. G. AUSTIN, Secretary.

# Membership List for 1906.

## A

|   |                              |
|---|------------------------------|
| Atchison, M. C., Woodbine.                      | Austin, W. W., Effingham.    |
| Alexander, C. B., Chicago (Star<br>Union Line). | Austin, E., Effingham.       |
| Adams, Chas. J., Loda.                          | Auten, A. O., Jerseyville.   |
| Adams, H. O., Effingham.                        | Aulenburk, Henry, Effingham. |
| Austin, Calvin, Effingham.                      | Ardrey, R. G., Oakdale.      |
| Austin, C. E., Effingham.                       | Austin, F. G., Effingham.    |
|   | Anderson, C. A., Belvidere.  |

## B

|  |   |
|--|---|
| Barwell, J. W., Waukegan.                            | Burton, H. R., Edgewood.                          |
| Biddulph, J. R., Providence.                         | Blanke, R. L., St. Louis, Mo.<br>(Blanke & Hauk.) |
| Boethke, Wm., Elmhurst.                              | Buchanan, G. L., Robinson, R. F.<br>D. 5.         |
| Bloyer, Otto, Elkhorn Grove.                         | Becker, W. J., Farina.                            |
| Bloyer, George, Harper.                              | Burton, G. F., Mt. Carroll.                       |
| Blood, F. J., Chicago (Wells, Rich-<br>ardson & Co.) | Baldwin, Geo. H., Mendon.                         |
| Browning, H. A., Elgin.                              | Beatty, Frank, Galena.                            |
| Buelter, Henry, Batavia.                             | Benton, D. C., Kaneville.                         |
| Barclay, A. C., Elgin.                               | Brinker F. H., Winneshiek.                        |
| Bueller, Anton, Bemes.                               | Bartholomew, C. L., Cedarville                    |
| Bagley, F. R., Chicago (Francis D.<br>Moulton & Co.) | Baldwin, R. C., Redpath.                          |
| Boehmer, H., Barrington.                             | Blacet, Stephen, Greenville.                      |
| Bloomfield, R. A., Mt. Sterling.                     | Blizzard, J. J., Greenville, F. R. 2.             |
| Bigler, A. W., Sigel.                                | Benthien, H. H., Sandwich.                        |
| Bissel, Effingham.                                   | Bragg, C. T., Franklin.                           |
| Bargfeld, Lawrence, Effingham.                       | Bollman, Benj., Rockford.                         |
| Brooks, J. S., Urbana.                               |   |

## C

|                                    |                                |
|------------------------------------|--------------------------------|
| Clapp, C. E., Quincy.              | Collidge, C. P., Winnebago.    |
| Carpenter, K. B., Thomson.         | Campbell, A. B., Oregon.       |
| Carbaugh, Wm. T., Lanark, R. R. 1. | Christensen, C., Mascoutah.    |
| Christ, John, Washington.          | Cook, Clarence, Beecher.       |
| Carr, George, S. Aurora.           | Coulson, E. H., Iuka.          |
| Coolidge, J. H., Galesburg.        | Causey, J. S., Mulberry Grove. |
| Crissey, N. O., Avon.              | Clinger, J. V., Stewardson.    |
| Collyer, W. D., Chicago.           | Cooley, Fred A., Yorktown.     |
| Culter, Geo. A., Belvidere.        | Crosier, Eli I., Utica.        |
| Campbell, M. S., Genoa.            |                                |

## C.

Caven, George, Chicago.  
 Cook, F. L., Lyle.  
 Carr, F. A., Aurora.  
 Cassens, Geo., Alhambra.

Cobb, E. N., Monmouth.  
 Carlisle, H. N., Effingham.  
 Cooksley, Alice M., Stillman Valley.

## D

Davis, S. E., Elgin.  
 Davis Bros., Fairchild.  
 Davenport, Prof. E., Urbana.  
 Davis, Wm. F., Quincy.  
 Duell, H. R., Sandwich.  
 Dorsey, L. S., Moro.  
 Dittimore, J. V., Indiana.  
 Diehl, Jno. H., Effingham.  
 Darik, Jas., Edgewood.  
 Dummemuth, Chas., Olney.

Dust, H. W., Effingham, R. F. D.  
 No. 4.  
 DeLano, H. W., Sugar Grove.  
 Dorsey, Clarence B., Moro.  
 Daniels, J. W., Greenville.  
 Defrees, Tallie, Greenville.  
 DeLaval Separator Co., Chicago.  
 Dewey, F. E., Capron.  
 Dickinson, F. J., Woodbine.  
 Dalbert, A., Richard.

## E

Eastman, H., Shabona.  
 Ehlers, Jno., Altamont.  
 Engbring, W. H., Effingham.

Erf, Prof. Oscar, Manhattan, Kan.  
 Eade, A. T., Greenville.

## F

Frein, H. P., Smithton.  
 Freund, S. H., Johnsburgh.  
 Francisco, M., Wauconda.  
 Fraser, Prof. W. J., Urbana.  
 Fourbain, B. C., Belvidere.  
 Frankenstein, H. C., Effingham.

Fellhoelter, Jos., Effingham, R. F.  
 D. 4.  
 Fredricks, Andrew, Elgin (DeLaval  
 Separator Co.)  
 Fryer, Wm., Winslow.  
 Foster, J. C., Sparta.  
 Farnham, A. D., Thomson.

## G

Gordon, M. D., Wyandotte, Mich.  
 (J. B. Ford Co.)  
 Gurler, H. B., DeKalb.  
 Gurler, G. H., DeKalb.  
 Gullickson, Martin, Frankfort Sta-  
 tion.  
 Grout, A. P., Winchester.  
 Gibbons, T. H., Elgin.  
 Glover, A. J., Ft. Atchison, Wis.  
 Greene, S. F., 7617 Union Ave., Chi-  
 cago (Miller Pasteurizing Ma-  
 chine Co.)  
 Grube, Geo., Greenville.  
 Gates, C. N., Chicago ( Creamery  
 Package Mfg. Co.)

Goldstein, H., Effingham.  
 Gravenhorst, A., Effingham.  
 Grovenhorst, J. W., Effingham.  
 Greene, L. P., 7617 Union Ave., Chi-  
 cago (The Sharples Separator  
 Co.)  
 Gillett, W. J., Rosendale, Wis.  
 Grossman, J. H., Martinville.  
 Grant, E., Farina.  
 Gieseking, W. G., Altamont.  
 Crobengieser, G. V., Altamont.  
 Gillespie, A. D., Watson.  
 Green, G. M., Mt. Olive.  
 Green, W. J., Welton.

## H

- Heth, G. W., Mason, R. F. D. 1  
 Herman, G., Manhattan.  
 Haecker, Prof. T. L., St. Anthony  
 Park, Minn.  
 Hicks J. E., Thompson.  
 Henry, R. J., Millersburg.  
 Hoppensteadt, Geo. W., Goodenow.  
 Hostetter, W. R., Mt. Carroll.  
 Hostetter, A. B., Springfield.  
 Harvey, W. R., Clare.  
 Herkenheim, P. J., Malta.  
 Horsing, S. S., Stillman Valley.  
 Hatch, Fred L., Spring Grove.  
 Holland, O. E., Warren.  
 Harvey, T. H., Effingham.  
 Haeger, D. C., Dundee.  
 Housh, J. R., 2846 LaFayette Ave.,  
 St. Louis, Mo.
- Heath, G. W., Mason, R. F. D. 1.  
 Hopson, J. J., Vail City.  
 Hauk R. B. St. Louis, Mo.,  
 Hendlemeyer,, Jos., Effingham.  
 Hopkins, Geo. C., Oregon.  
 Howell, Carrie B., R. R. No. 2 Ur-  
 bana.  
 Hall, C., R. R. No. 1, Cantrill.  
 Hunt, James R., Ottawa.  
 Hovey, E. L., Capron.  
 Hilfiker, Jas. H., Manhattan.  
 Hopper, H. A., Urbana.  
 Hayden, C. C., Urbana.  
 Haecker, Prof. A. L., Lincoln, Neb.  
 Hicks, J. E., Chadwick.  
 Hunt, Geo. A., Hebron.

## I

Irish, H. B., Farina.

## J

- Jennings, A. A., Chicago (Star  
 Union Lines.)  
 Johnson, Ernest, Hebron.  
 Janes, W. E., Hinsdale.  
 Jensen, S. M., Orangeville.  
 Johnson, Lewis, Stewardson.
- Johnson, R., Oblong.  
 Jorgensen, F. A., Urbana.  
 Jensen, A. F., Effingham, R. F. D. 4  
 Jones, A. H., State Food Commis-  
 sioner, Chicago.  
 Johnson, Lars, Stewardson.

## K

- Knigge, L. H., McHenry.  
 Kendall, George, Mt. Carroll.  
 Kirkpratrck, J. R., Oakdale.  
 Kilbourne, C. S., Aurora.  
 Kimzey, W. R., Du Quoin.  
 Kent, A. H., Mulberry Grove.  
 Kane, Wm. Morrison, R. F. D. 4.
- Kleckner, H. S., Orangeville.  
 Koors, Frank, Fairfield.  
 Krafft, W. M., St. Louis, Mo.  
 Koester, W. J., Effingham.  
 Koester, Toney J., Effingham.  
 Koeke, Jno. B., Effingham.

## L

- Ludwig, Mat, Lockport.  
 Lally, W. A., Chicago (New York  
 Despatch Transportation Co.)  
 Long, M., Woodstock.  
 Litchardt, Herman, Schaumberg.  
 Leass, S. L., Sullivan.  
 Lindley, Hon. C. J., Greenville.  
 Lohmen, Wm. C., Sorento R. R. 2.  
 Lee, Carl E., Urbana.
- Lowitz, Chas. C., Wyandotte, Mich  
 (J. B. Ford Co.)  
 Long, J. H., Effingham.  
 Loy, J. H., Effingham.  
 Lloyd, W. B., Kinmundy.  
 Liell, John, M., Edgewood.  
 Le Crone, G. M., Effingham.  
 Lied, John M., Edgewood.

## M

- Mann, W. E., Pecatonica.  
 Metzger, F. L., Millstadt.  
 McNish, F. J., Chicago (Creamery  
 Package Mfg. Co.)  
 Moore, W. S., Chicago.  
 Muller, F. J., Forreston.  
 McCredie, Wm., Elgin.  
 Mallory, Grant, Freeport.  
 Mason, J. L., Elgin.  
 Mason, J. P., Elgin.  
 Monrad, J. H., New York.  
 Musselman, S. L., Brookville.  
 Maurer, W. H., Rock Grove.  
 Maule, A., Shirland.  
 Murray, Otis C., Johnsburg.  
 Mitchell, C. E., Effingham.  
 Mantz, L. P., Watson.  
 Martin, A. W., Altamont.
- McFarland, Frank, Big Rock.  
 Michener, E. P., Chicago (Briggs  
 House.)  
 Mann, F. J., Gillman.  
 Machamer, I. G., Lanark.  
 Mingle, John, Toledo.  
 Montgomery, A. R., Capron.  
 Misner, F. H., Rockford.  
 Meyer, Adolph, Greenville.  
 Morris, Geo. O., Greenville.  
 Marquardt, T. W., Lombard.  
 McCarnaghie, Samuel, Leland.  
 Montgomery, A. R., Capron.  
 Macey, V. D., Mooresville, Ind  
 Miller, Geo., Metropolis.  
 Miller, R. M., Metropolis.  
 Marksman, Jno., Effingham.

## N

- Nelson, Peter, Creston.  
 Newman, Joseph, Elgin.  
 Nelson, L., Camp Point.  
 Newman, John, Elgin.
- Nolting, E. L., Elgin.  
 Nolting, August, Elgin.  
 Newbery, J. W., Sigel.

## O

- Olson, Chas., Kirkland.  
 Poppett, C. A., Dunlap.  
 Osgood, H. B., Chicago (Creamery  
 Package Mfg. Co.)  
 Overbeck, Jno., Effingham.



## P

- Patton, R. A., Hanna City.  
 Powell, L. A., Bowen.  
 Peak, S. W., Winchester.  
 Patterson, J. P., Plainfield.  
 Palmer, F. R., Pearl City.  
 Pfingston, H. W. F., Schaumberg.  
 Pierce, Harry, Savanna.  
 Palmer, H. W., McLean.  
 Purviance, Mrs. H. P., Lincoln.  
 Powell, J. W., Peoria, (Merchants  
 Despatch Transportation Co.)  
 Phillips, Louis, Germantown.  
 Parker, R. H., Effingham.  
 Palmer, J. A., Effingham.  
 Phillips, Edw., Griggsville.

## R

- Redpath, R. G., Baldwin.  
 Rutter, Geo. E., St. Libory.  
 Rawson, Frank E., Alden.  
 Rice, H. B., Lewiston.  
 Roessler, Theodore, Shelbyville.  
 Robertson, N. Y., 262 Wabash Ave.,  
 Chicago (Diamond Crystal Salt  
 Co.)  
 Riegel, John O., Highland.  
 Roby, Wm., Fairfield,  
 Ramsey, S. B., Effingham.  
 Rynders, C. W., Waverly.

## S

- Sudendorf, E., Clinton (Wells, Rich-  
 ardson & Co.)  
 Spanger, E. E., Big Rock.  
 Sloggett, John, Hinckley.  
 Sullivan, Miss Lizzie, Providence.  
 Spies, L. A., St. Jacob.  
 Staples, W. S., Hooppole.  
 Steidley, A. B., Carlinville.  
 Spencer, C. V., Chicago (Santa Fe  
 Railroad.)  
 Schlattman, Fred, St. Libory.  
 Springer, Mrs. Eva H., Springfield.  
 Slouborg, Thomas, Savanna.  
 Straw, T. H., Shannon.  
 Springsteen, P. J., Beecher R.F.D. 3  
 Speed, Chas. V., Baileyville.  
 Scotey, W. H., Greenup.  
 Strain, Jas. A., Greenville.  
 Shoemaker, A. A., Nokomis.  
 Scharth, John, Mascoutah.  
 Snyder, J. E., (Cry. Pkg. Co.) Rock-  
 ford.  
 Swartz, S. A., Greenville, R. R. 1.  
 Siek, W. J., Greenville.  
 Schumaker, John, Elderdomont.  
 Shilling, S. B., Mason City, Ia.  
 Seaman, J., Greenville.  
 Stocker, J. J., Greenville.  
 Sanmann, J. F., Havana.  
 Schwartz, Ed., Damascus.  
 Smith, S. F., Columbus.  
 Scott, J. E., Scales Mound.  
 Simonson, Geo., Renard.  
 Slegal, Jesse W., Effingham.  
 Sur, J. W., Effingham.  
 Soltwedel, H. Y., Effingham.  
 Shepard, W. P. Chicago (Empire  
 Cream Separator Co.)  
 Sumner, J. B., Effingham.  
 Starmann, Benj., Effingham.  
 Schuknecht, H. E., Elgin (Ass't  
 State Food Commissioner.)  
 Saumann, J. F., Havana.  
 Schoen, H. M., Edgewood.  
 Schlosser, G., 9140 Erie Ave.,  
 Chicago.  
 Singer, J. V., Stewardson.  
 Schumaker, B., Mason.  
 Smith, C., Effingham.  
 Schumacker, J., Altamont.

## T

- Thompson, Frank B., Greenwood.  
 Thurston, Henry F., 355 Dearborn  
 St. Chicago.  
 Thornton, Chas. H., Argyle.  
 Tindall, W. K., Malta.  
 Thompkins, H. S., Union.  
 Terpening, J. D., New Lenox.  
 Tatten, Geo. E., Garden Prairie.
- Tenney, J. G., Chicago (Merchants  
 Despatch Transportation Co.)  
 Terry, D. M., Earlville.  
 Truman, J. M., Urbana.  
 U.  
 Upton, E. N., Effingham.  
 Ulmer, Jno. T., Effingham.

## V

- Van Patten, David, Plainfield.  
 Van Curen, S. J., Belvidere.  
 (National Creamery Supply Co.)

## W

- Whitney, R. A., Greenville.  
 Williams, C. H., Chicago (Colonial  
 Salt Co.)  
 Wright, F. W., Joslin.  
 Wood, R. L., Woodhull.  
 Wilson, E. L., Manhattan.  
 Waspi, J. S., Spring Grove.  
 Wiggins, L. N., Springfield.  
 Woodard, C. H., Big Rock.  
 Wentworth, E. M., Davenport, Ia.  
 (Star Union Lines.)  
 Willson, D. W., Elgin.  
 Weaver, Vernon A., Greenville.  
 Welsh, S. T., Lake Creek.  
 Welsh, Geo., Greenville.  
 Wright, S. N., Elgin.  
 Woolverton, D. C., 154 Lake St.,  
 Chicago.  
 Willson, W. C., Elgin.
- Wood, D. E., Elgin.  
 Wilkening, W. C., Schaumberg.  
 Walton, Edw. B., Arma.  
 Woodburg, A. E., Danville.  
 Winter, A. C., Waterman,  
 Wilson, L. D., Greenwood.  
 Wyman, B. F., Sycamore.  
 Worman, A. J., Effingham.  
 Worman, C. A., Ludopton.  
 Wise, G. W., Effingham.  
 Webster, E. H., Washington D. C.  
 (Chief Dairy Division.)  
 Wachtel, Wm., Effingham, R. F. D  
 No. 1.  
 Walker, Dr., Effingham.  
 Wisner, G. L., Martinsville.  
 Wilson, Chas. G., Martinsville.  
 Walton, E. W., Anna.  
 Walker, Dr. J. H., Effingham.

## Y

- Youngs, H. J., Stillman Valley.



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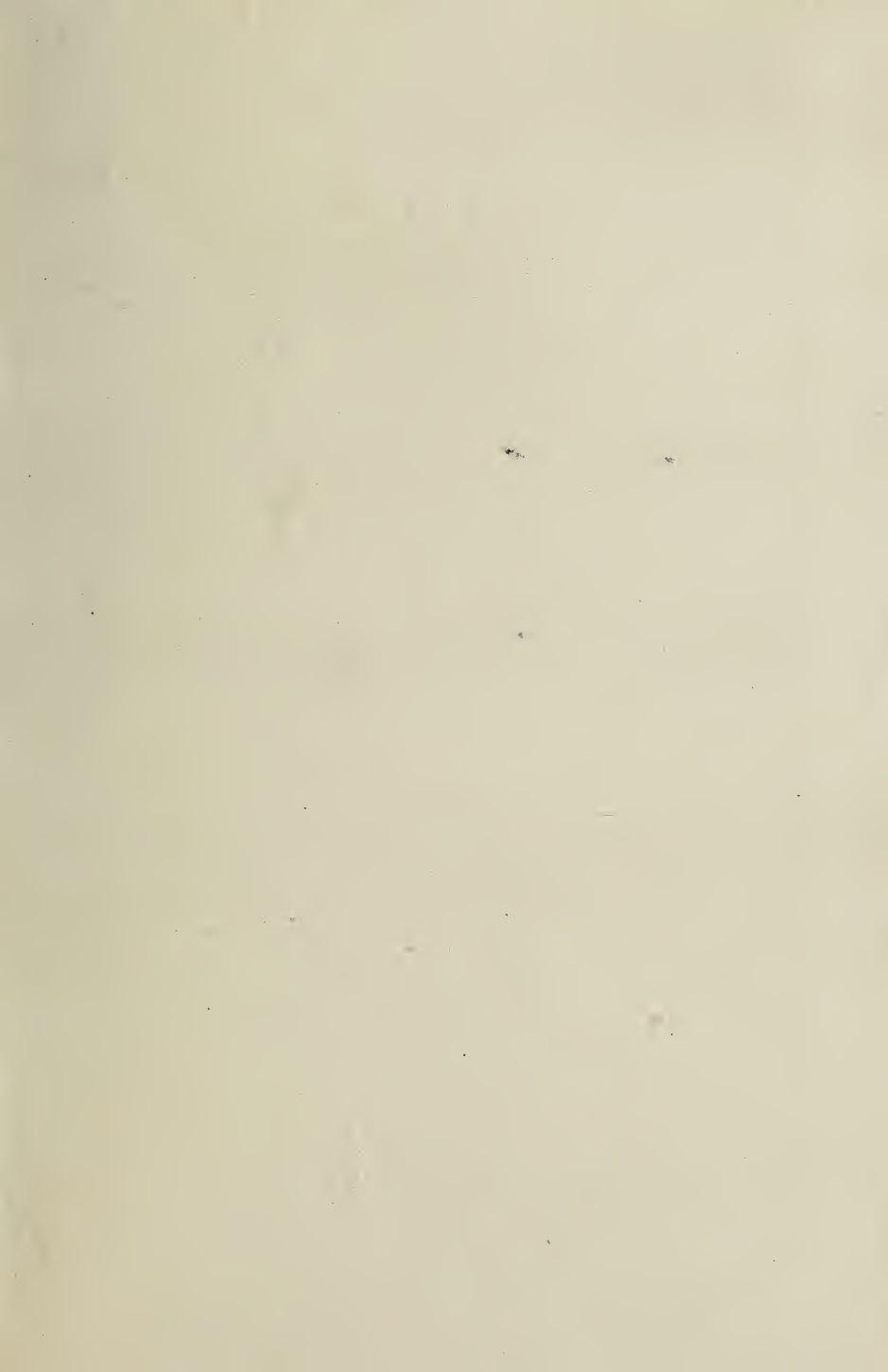
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