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U. S. DEPARTMENT OF AGRICULTURE.

Report No. 77.

ALFALFA AND BEEF PRODUCTION IN ARGENTINA.

BY

FRANK W. BICKNELL,
SPECIAL AGENT.



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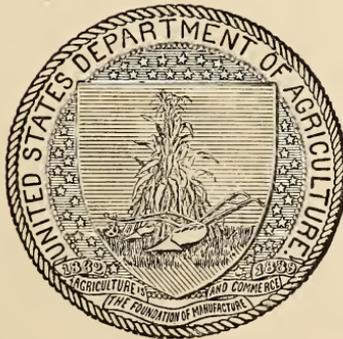
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ARGENTINE TERMS AND MEASURES USED.

For the convenience of the reader in the United States all terms and measures employed in this report have been converted into terms employed in the United States, except where otherwise expressly stated. Some terms and expressions in use in Argentina, or having a special meaning there, are occasionally used, and these are herewith explained.

Money.—All expressions of value, unless otherwise stated at the time, have been converted into United States currency. The Argentine gold dollar is worth \$0.965 in United States currency. The paper dollar, which is the general circulating medium, is worth about 44 cents of our money. All transactions in Argentina are in paper money unless gold is specified.

Metric s stem.—The metric system of weights and measures is in use in Argentina, and is the only legalized system. Some of the old Spanish or local terms are still in use, however, especially in the country. The kilo, abbreviation of the word kilogram, is the standard unit of weight, and is equal to 2.2046 pounds avoirdupois.

Land measurements.—The official unit of land measurement is the hectare, equal to 2.471 acres. A "square" of land is equal to 4.17 acres, and this old term is in very general use. The common understanding of the "league" of land is a square league, equal to 6,672 acres. A kilometric league of land, the official measurement, is equal to 2,500 hectares, or 6,178 acres.

Estancia and estanciero.—An estancia is, primarily, a stock ranch, and the owner and operator is an estanciero. But the estancia may include other things. It may also be a breeding establishment or that only. It may deal in cattle, horses, or sheep, or all three, either for sale in the open markets for beef or mutton, or for feeding stock, or for breeding purposes, or all these. Cereal production and hay making may be added to these, and sometimes this may be the most important part of the estanciero's business. So in translating it is impossible to say in a single word just what is meant. In this report the words estancia and ranch have been used synonymously, also the words estanciero and ranchman.

Chacra and chacarero.—A chacra is a farm on which cereals or other crops are raised, as distinguished from the estancia or stock ranch. The chacarero is the farmer or man who operates a chacra.

Camp.—In Argentina people speak of the country outside of the cities as the "camp." They say, "I am going to the camp," where we would say, "I am going to the country." The word is also used in speaking of the land—as, for instance, "My camp is in good condition," or "The alfalfa camps are holding out well."

Alfalfar.—An alfalfa field.

Frigorifico.—A meat-packing establishment where cattle and sheep are slaughtered and the carcasses either frozen or chilled for export.

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY,
Washington, D. C., January 8, 1904.

SIR: I have the honor to submit herewith a report upon the influence of alfalfa upon beef production in Argentina, to which I have added some late information concerning the market for pedigreed stock in that country. The opportunity for our breeders was never as promising there as it is now. I therefore respectfully suggest that this report be printed for the guidance of the breeders of the United States who may wish to enter that market. Argentines are very eager to secure first-class breeding stock, and the English breeders who have been supplying the demand have found the business highly profitable.

This report is supplemental to my bulletin on "The animal industry of Argentina," printed as Bulletin No. 48, Bureau of Animal Industry.

Acknowledgment should be made to the following-named gentlemen in Argentina, whose intelligent and willing cooperation made this report possible: John Benitz, Glynne Williams, Eduardo Bullrich, William O. Benitz, Henry B. Coffin, Leonardo Pereyra, Ronaldo Tidblom, Alfredo Benitz, Dr. Enrique Fynn, jr., Arturo Bab, Adolfo Aymerich, Alfredo Sanders, J. Charles Pearson, Latham Hall, Nicolas Calvo, and C. A. Roberts.

Respectfully,

FRANK W. BICKNELL,

Special Agent and Agricultural Explorer.

HON. JAMES WILSON,
Secretary.

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ALFALFA AND BEEF PRODUCTION IN ARGENTINA.

ALFALFA GROWING AND ITS RELATION TO CATTLE RAISING.

INTRODUCTION.

Without alfalfa Argentina would occupy an unimportant place as a beef producer in the markets of the world. Alfalfa has redeemed to profitable use millions of acres of Argentine land that would otherwise be unproductive. Alfalfa sends the Argentine steer to market a year younger than when the native grasses were relied upon exclusively. In many places, especially in the northern part of the country, it has made money for the small farmers, or "colonists," who have cut it and sold it for hay for export or for domestic use. Cattle raisers have learned its value in a dry, cold winter, when the pastures have failed, and but for the alfalfa hay, put up by the provident against such an emergency, hundreds of thousands of cattle would starve. But this marvelous forage plant is valuable in Argentina chiefly because it gives a rich fattening pasture on land that is otherwise of small value. Alfalfa is the only plant that will send its roots down deep enough to get the moisture necessary to growth.

GROWING OF ALFALFA AND PRICE OF LAND.

It is the ambition of nearly every ranchman, or *estanciero*, to get as much of his place into alfalfa as possible, and the area of alfalfa pasture is increasing enormously every year. In some sections it is still in an experimental stage and in others it has proved a failure, at least for pasturage; because "tosca," a limestone formation, is too near the surface of the ground or because native summer grasses overcome it. But the failure of wheat in the northern part of the Province of Santa Fe (Pl. I, frontispiece) has driven small farmers to turning their wheat farms into alfalfa fields or to moving to another part of the country, either to raise cereals under more favorable conditions or to go into alfalfa where experiments have shown that it will succeed. Farmers in the same region who, instead of putting all their land into wheat or flax, have planted alfalfa and corn and raised cattle have done well. As soon as a brief experiment demonstrates the adaptability of a new region to alfalfa, there is a grand rush to get in.

Land jumps up incredibly in value; thousands of acres often change hands several times in a year, with valuations doubled at each exchange. This was the case in 1902 with lands in the central part of the Province of San Luis, 425 miles by rail west of the city of Buenos Aires. It was found that alfalfa would grow very well there, and the lands were wanted by men owning large cattle ranches (Pl. II) in the Province of Buenos Aires, where they could not afford to fatten their steers. They wanted cheap alfalfa lands to which they could send their young steers to fatten and on which they could breed others.

Alfalfa for pasturage for fattening cattle is not grown so much in the Province of Buenos Aires, where land is most valuable and the country most settled. There are several reasons for this, the chief ones being that they have good, rich, native summer and winter grasses (Pl. III) and do not need the alfalfa so much, and these native grasses exterminate alfalfa in a few years. Besides, the winters are longer and colder in Buenos Aires than in the alfalfa regions north and northwest, and land for alfalfa is much more expensive in "the Queen Province," as Buenos Aires is called.

METHODS AND PROFITS IN GRAZING ALFALFA.

The system now generally coming into vogue is to raise feeders in the Province of Buenos Aires and in the far north, to be taken to the alfalfa camps (fields) to fatten. In the south of Buenos Aires the winters are so long and severe that it is not the rule to fatten steers, but to sell them at 2 years of age to go to the alfalfa camps for eight to twelve months' feeding. Estancieros in southern Buenos Aires say that unless steers are housed there they have very little chance of becoming fat. Still I have seen some very good looking steers, Polled Angus and Shorthorn, in this neighborhood, 20 miles east of La Colina, which is a little less than 300 miles south of the city of Buenos Aires.

The following is the opinion of an alfalfa ranchman of wide experience and notable success in the Provinces of Santa Fe and Cordoba:^a

You can buy a league (6,672 acres) of virgin land for \$11,000, or \$1.65 per acre and, by spending as much more in putting it into alfalfa, have a ranch that will carry 3,000 cattle and keep them practically fat all the year round, with very little risk from drought or severe winters. These provinces that grow alfalfa so easily (Cordoba, Santa Fe, San Luis, and western Buenos Aires) are the future

^aMr. John Benitz, who went from California to Argentina thirty years ago, and with his brothers, William and Alfred, has been very successful with alfalfa and cattle. On their home estancia, "La California," about 70 miles northwest of the city of Rosario, they were the pioneers in the planting of alfalfa, and were among the first, if not the first, to have a league of it. The one quoted is now working about 60,000 acres in alfalfa in southern Cordoba.



BRICK BARN FOR CATTLE, GRAIN, AND HAY, NORTHERN BUENOS AIRES.

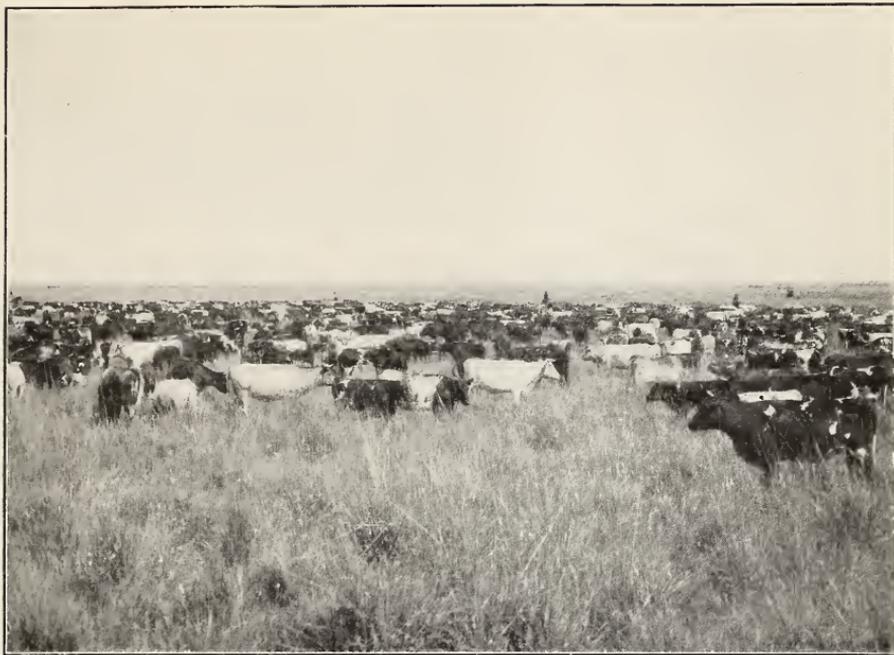


FIG. 1.—HERD OF 5,000 GRADE DURHAM COWS ON NATIVE GRASS, 160 MILES WEST OF THE CITY OF BUENOS AIRES.



FIG. 2.—SHORTHORN COWS AND CALVES ON NATIVE SUMMER GRASS, NORTHERN PART OF THE PROVINCE OF BUENOS AIRES.

grazing lands of the Republic. It is astonishing what large areas are taken up every year and turned into alfalfa, to be stocked with the best cattle to be purchased in the Province of Buenos Aires. Cattle develop here better than on the finest natural grasses of the Province of Buenos Aires.

THE REGION OF ALFALFA GROWING.

Alfalfa is grown all over the Province of Santa Fe, except in the extreme northern part, north of latitude 30° south; in all the Province of Cordoba south of the city of Cordoba and in mountain valleys north of the city; in most of the Province of San Luis, where it is fast increasing; in the northern part of the Territory of the Pampa; more or less, either for hay or grazing, in the entire Province of Buenos Aires, especially in the west and north (Pl. IV, fig. 1); to some extent in the Province of Entre Rios, where it has not done so well; in the irrigated and fertile valleys of the rivers in the southern territories of Rio Negro, Neuquen, and Chubut to a limited extent; and small areas in the northern provinces of Mendoza and San Juan. It is at its best in southern Cordoba, Santa Fe, San Luis, and western Buenos Aires.

SEASON AND METHODS OF SEEDING WITH ALFALFA.

Most of the seeding with alfalfa in Argentina is done in the fall, in the months of March and April,^a where it is sown alone, or two or three months later where sown with cereals. The difficulty of preparing large areas for sowing early in the fall operates to postpone the sowing, as the great saving in expense leads farmers, especially estancieros, or large stock farmers, to sow with wheat or flax, or sometimes barley or corn. Harvesting and thrashing cereals are hardly finished during January and February, and hauling to market is not done till the end of February or well into March. This makes it difficult and expensive to get the land plowed for alfalfa sowing in March or April. Besides, the land is likely to be too hard to plow till after the first fall rains. There is no doubt, however, that the best results are secured by sowing at this time and without the nurse crop. The heat of the summer is over by the last of March, and the alfalfa plants get a good start before frost and the dry winter months of the northern region. In the spring the alfalfa is strong enough to smother any grasses or weeds that may come up. This is the general opinion over the country, though one very successful alfalfa grower in the Province of Buenos Aires, not far from the city, sows in August or September. His land is more sandy and probably does not encourage the growth of weeds to the extent that stronger soils do.

^aIt must be remembered throughout this report that the seasons are those of the southern hemisphere, the reverse of seasons in the United States.

SOWING ALFALFA WITH A COVER CROP.

A great majority of the ranchmen of Argentina who raise alfalfa consider the advantages of sowing it in June or July with wheat or flax to be so great that a very large part, probably three-fourths, is sown that way. The objection to this plan is that the plants do not get a good start in this sometimes dry and always cold season; that the wheat chokes the alfalfa back until after the wheat is cut, when the rain and heat stimulate weeds that sometimes overcome the alfalfa. The same amount of seed sown without a nurse crop will give more and better plants than with it.

But when a ranchman has a large area that he can get into alfalfa in two or three years without any expense to himself, the land paying him an income in the meantime, he is very likely to adopt that method, though it does not give quite as heavy a stand of alfalfa at first. For the man who is short of working capital there is no other practical way. The system prevails all over the country where cereals and alfalfa do well in the same region, but is less followed in the south of Cordoba, the best alfalfa country, and not at all in the newer regions in San Luis. Ranchmen (*estancieros*) in the Province of Buenos Aires, who have large areas in native grasses, are turning the land over to colonists, or renters, who raise wheat on it for two or three years, under a contract that requires them to sow alfalfa with the wheat the last year, the seed furnished by the landowner. Thus he gets the best results with wheat, and the land is handed back to him covered with alfalfa.^a

So much of this has been done that it has led many cattlemen to the opinion that agriculture is only transitory, and that the future of Argentina depends upon cattle and alfalfa; but they admit now that they must have corn to finish their steers. An English *estanciero*, Mr. Glynne Williams, who has a large place near Coronel Suarez,

^aSeñor Ronaldo Tidblom, Director of the Argentine Bureau of Animal Industry, gives the following account of an operation of his own as a practical *estanciero*:

"I have sown 42,000 acres of camp with wheat and alfalfa in the south of Cordoba and Santa Fe, where I could only keep 1,200 breeding cattle per kilometric league (6,178 acres), with a gross profit of \$308,012, with a total expense of \$208,741 and net profit of \$99,271, said camp having now a carrying capacity of from 6,250 to 7,000 breeding cattle per kilometric league. The pastoral grass is burned, the land plowed and well harrowed in October, November, December, January, and February; it is plowed deeply a second time in May, June, or July, harrowed, the wheat seeded thin, and again harrowed; the alfalfa is then seeded at 22 pounds per acre, the land harrowed with chain harrows and then rolled. The alfalfa germinates more or less at the same time as the wheat; the wheat is harvested in December and cut as low as possible, and the land is allowed to lie until the following September or October, our spring, when it is eaten bare by cattle, and is then ready to produce hay or pasture, as may be desired. This is the means of increasing five, ten, and even fifteen fold the carrying capacity of thinly grassed rough lands, giving a profit during the transformation."

This is a more elaborate system than that in general use, however.

about 300 miles south of the city of Buenos Aires, where he carries on mixed farming, wrote in May, 1903:

Last year I harvested 30 bushels of wheat per acre on a piece where this year I have very good alfalfa, while the alfalfa which I sowed with the wheat last year looks extremely well to-day. The advantages of sowing with wheat are obvious in the saving of another plowing and, far more than this, in the saving of time and having the alfalfa for the winter after the wheat is cut, which is the time when feed is most wanted. Until I see far more decided advantages than I do at present in sowing alone, I intend to continue sowing with wheat, so long as the latter remains a paying crop. As far as my experience goes there is no objection to grazing alfalfa with cattle while it is young. To do so with sheep and eat it bare would, I think, be dangerous, as they crop it too closely.

Mr. John Benitz says, concerning southern Cordoba, where he is now working about 60,000 acres, mostly in alfalfa:

I have had the best results by breaking up virgin camp in the fall or spring and at once cross disking, harrowing, and sowing with alfalfa alone and covering it with a lighter harrow. Alfalfa so sown can be stocked with cattle two or three months after sowing, fed down close and trampled. Then the stock should be taken off for a few months, and the alfalfa will grow splendidly. The ground being new, no grass or weeds come up. If alfalfa and wheat are sown together cattle can not be put on till a year after, but if sown alone cattle can be put on permanently when it is six months old.

In the north of Santa Fe, in the Jewish colony at Mosesville, the manager told me that it was not advisable to sow alfalfa there on new soil, and that a previous culture with corn, flax, or wheat was to be preferred.

GRAZING ALFALFA WHEN YOUNG.

The opinion seems to be quite general in Argentina that more or less feeding is good for alfalfa when it is young, certainly by the time it is five or six months old, as the tramping is beneficial and the plants should not be allowed to go to seed the first year. Sometimes sheep are put into the alfalfa pastures with an attendant to keep them moving and prevent them from eating too closely. They eat the weeds and do a fine job of tramping. Mr. Williams says that during a good spring it is impossible to keep the alfalfa down with grazing because the appliances for watering stock are not calculated for the number it would then carry. On a piece sown with wheat which gave 30 bushels to the acre last year he had for some time last spring, or less than a year after the wheat was cut, four to five animals, yearling calves and old cows, per hectare (2.471 acres), and he was at the same time cutting some of it for hay. In May, 1903, he had rather more than one cow per hectare fattening. Later on, if the weather got very dry and cold, he might not be able to keep any stock on it for a time. Some stockmen cut the alfalfa the first year and do not allow stock on it until it is about a year old. The difference of opinion on this point is due to different conditions and to overstocking young alfalfa. It requires experience to know how far to go with the feeding.

AMOUNT AND PRICE OF SEED.

The amount of seed sown varies greatly according to locality, individual opinion, and whether land is old or new. The amount per acre ranges from 9 to 35 pounds, generally from 11 to 18 pounds. More seed is used on old land than on new, though 18 pounds per acre is sown in southern Cordoba on new land without a nurse crop. The price of seed varies considerably, according to the season, for now it is all produced in the country. Seed is harvested in southern Cordoba, Santa Fe, and western Buenos Aires, while very pure seed is raised in Chubut in small quantities. A yellow butterfly or rain at the time of fertilization sometimes destroys the crop of seed. A dry season, checking the growth, is favorable to the production of seed, but it is not considered advisable to allow alfalfa to go to seed more than once in five years. Some ranchmen believe in letting it go to seed and resow itself. Seed is sold by the 10 kilos (22.046 pounds), and the price is from \$1.42 to \$2.84 United States money for that amount, or \$3.35 to \$7.70 per bushel of 60 pounds.

LIFE OF ARGENTINE ALFALFA.

More variation is found in the number of years alfalfa will live in Argentina than in any other feature of the business of growing it. Bad seasons and close feeding may wear it out in three years in some localities, while in other places fields that are cut only will live for twenty-five years and still make a good showing. The latter is a very rare and extreme case, and the former is quite unusual, except where the pasture has been abused. Alfalfa lives longest and gives best results in the light soil of the upper provinces, in western Buenos Aires and in San Luis. The strong native grasses, which after a few years overcome alfalfa in the Province of Buenos Aires, do not exist to the same extent in Cordoba, Santa Fe, and San Luis. The soil is not rich enough to sustain them, as they do not reach down for the moisture, so there is little to interfere with alfalfa in these regions. In Buenos Aires, from the city south, estancieros estimate that alfalfa, used only for cutting, and well cared for, will live from five to ten years, differing according to locality and seasons. One, who lives near the city and has a very large breeding establishment, manures his alfalfares, and they last seven or eight years, but he does not put cattle on them. If constantly fed, the life of the pastures in this province, except in the west, is not more than three or four years. The native grasses come up and choke it out.

In southern Cordoba alfalfa with ordinary care will last fifteen years, but if fed short it may be completely killed out in five years. It is said that cutting instead of grazing improves it by allowing it to come up to its full height, which is life to alfalfa. In the Province of Santa Fe estimates of the life of alfalfa range from three to twenty-five years, depending upon the seasons and how it is treated. When

cut often and not stocked with sheep and little or not at all with cattle, the estimates of its life are from ten to twenty-five years, with the majority around fifteen years.

In the Jewish colony in upper Santa Fe they say ten to fifteen years if cut only, or six years if fed. Indeed, Don Arturo Bab, the manager of the colony, says that there does not seem to be any limit there to the life of alfalfa that has been continually cut and fertilized by turning on cattle only in winter. He points to fields in that neighborhood fifteen years old and still in good condition. But if continually pastured, alfalfa in this region lasts but a few years, being crowded out by native grasses. These native grasses, says Señor Bab, will not sustain finely bred cattle, which deteriorate very rapidly and even die if given nothing else. Only native cattle can live on them, and even these will not fatten. The great heat in summer burns up the fine grasses; only alfalfa endures. The colonists under Señor Bab have found a sure and profitable business pasturing well-bred cattle on alfalfa. The carrying capacity there is estimated by the manager to average three-fourths of an animal per hectare (2.471 acres) on natural pastures, and on alfalfa five breeding animals or three for fattening. Of course this estimate is subject to great changes, according to the amount of rainfall.

Around Carcaraña, 30 miles west of Rosario, they have fields twenty-five years old, but the average is ten to fifteen years if cut, five to seven years if fed, and eight to nine years if fed and cut. This is about the average for the greater part of the alfalfa region, but of course varying conditions shorten or add to the life of alfalfa in different regions.

Little is done to prolong the life of alfalfa. Some farmers and ranchmen use disk harrows or plows in the spring with beneficial results. Some are of the opinion that this is of but little and only temporary benefit, and that it hardly pays. They say it is better and cheaper to let the alfalfa go to seed, resow itself, and then plow it. Others say that if they could get satisfactory disk harrows to cut 2 or 3 inches deep and not clog, such implements would be used with great benefit to alfalfa, starting new plants every spring, and would be generally used.

CATTLE-CARRYING CAPACITY OF ALFALFA.

Alfalfa never does less than to double the carrying capacity of the native grasses of Argentina, however rich they may be, unless it happens to be in a locality where rock is too near the surface for alfalfa to do well. Generally it multiplies the carrying capacity three to six times. In southern Cordoba, Santa Fe, western Buenos Aires, San Luis, and other favored alfalfa regions, 3,000 cattle are now being fattened all the year around on every league (6,672 acres) of alfalfa, and another thousand, or even more, might be added if they were all

breeding cattle. Hitherto these camps would carry only about 800 animals per league, and give the animals barely enough vitality in the summer to carry them through the winter. The native grass there is called "pasto fuerte," which means tough grass; and so it is, wiry and thin. Cattle rarely get fat on it, and only the tough, under-sized native cattle can live on it. Better bred stock deteriorate at once; so this region and thousands of leagues of Argentine territory would not be stocked with good cattle without alfalfa. In south central Buenos Aires, where the native grasses have nearly all been killed off by overstocking with sheep, the hard, worthless "pasto puña" has come on and the fine grasses have no chance. The carrying capacity of this land was 2,500 to 3,000 sheep per league, or 500 cattle, and they barely managed to keep alive. Now, under alfalfa, the same land carries 7,000 sheep or 1,200 cattle and keeps them in good condition the year around.

At the rate of one animal to $8\frac{1}{2}$ acres, the usual average carrying capacity of native grasses, alfalfa makes land for grazing purposes worth five to eight times as much as it was before alfalfa took the place of the native grasses. Some native pasture (Pl. III) in the Province of Buenos Aires will carry one animal for every 2 acres, but of course nothing will stand dry seasons as alfalfa does. This was thoroughly proved in the dry, cold winter of 1902 in Argentina. Alfalfa pastures that seemed to be all dead made an astonishing recovery the following spring. Ordinarily when the native grasses have been entirely dried up alfalfa is still green and furnishing food for the animals, because of its deep-drawn water supply. Indeed, it is quite safe to say that alfalfa pasture is always worth two to two and a half times as much as the best combination of native summer and winter grasses. It is often said that a native grass called "gramilla," which comes with alfalfa, adds to its feeding value.

The carrying capacity of alfalfa pasture in Argentina is estimated at from two and a half to four animals per square (4.17 acres) the year around, or, in round numbers, from three-fifths to one animal per acre. An animal here always means a beef animal, and it is estimated that any pasture will usually carry four times as many sheep as it will cattle. This estimate is for breeding cattle. For fattening it must be reduced somewhat, but not much. Except in the winter alfalfa pasture will fatten three to five rough animals per square in five to eight months. Rough thir work oxen are fattened in this time. There is a large business in raising feeders on poorer lands north or south on native grasses and driving them in great troops to the alfalfa fields to be fattened. As the animals approach within a few months of the age at which they should start for market they are shifted about from one pasture to another and are given the best on the place. At other times they are not moved much, but are left in one large pasture sufficient for their needs for a year.

WASTE OF ALFALFA AND OVERSTOCKING.

In the summer much alfalfa is allowed to go to waste because it is not always practicable to put more cattle on to fatten in the summer than can be carried through the winter. Some cutting of pastured alfalfa is often done. After the first spring growth has been eaten down the cattle are taken out for a few weeks and hay is put up, with a temporary fence built around the stacks. If the pasture gets poor in the winter, the fence is taken down and the cattle allowed to eat the hay in the stack. If not used during the winter, it may be sold in the spring. But this plan is not followed by all ranchmen. The ranchman (*estanciero*) is not always prepared to do much haying. He leaves that to the small farmer.

Overstocking is one of the weaknesses of the Argentine ranchman, though he is learning better through expensive lessons. When cattle were cheap and slaughtered for their hides it did not matter so much if a man lost a few thousand occasionally. He stocked his camp to the limit of its capacity at its best, and when a bad season came he lost half his stock or more. It often cost more to feed them than they were worth. Now, with valuable graded cattle they can not afford this. They have found by experience that alfalfa will be better in the winter and will live longer if it is not eaten down closely in the summer, but is permitted to grow to its full height.

MAKING HAY OF ALFALFA.

Raising alfalfa for hay is a good business in Argentina, if the haul to the railway station is not too long. It is done mostly by small farmers, "chacareros," within 10 or 15 miles of railway stations, though occasionally large *estancias* do a big business in it when favorably located. On these great ranches, however, alfalfa is used chiefly for grazing, and only enough is cut for hay to supply home needs and guard against a dry, cold winter, when the pastures run down. Valuable breeding stock is fed dry alfalfa more or less the year round, though there is a growing demand for a good quality of bulls, "á corral"—that is, bred to the open field and able to run with the herd and take chances the year round.

ADVANTAGES OF CUTTING AND GRAZING COMBINED.

There is little difference of opinion in Argentina about the advisability of cutting the surplus from alfalfa pastures in the summer. Unless double the number of animals are put on in the summer they can not eat the luxuriant crop that grows, and they waste it. "Theoretically," says Mr. Williams, in the south central part of the Province of Buenos Aires, "there is no reason why all the alfalfa should not be cut every year, but practically it is impossible to do so when dealing with thousands of hectares. It is much more economical to store it

for winter use by stacking than to allow it to grow into a tangled mass, which the cattle trample and spoil." Mr. John Benitz, of southern Cordoba, says: "Cutting improves alfalfa, allowing it to come up to its full height, which is life to it." He warns against the practice of stocking alfalfa to the limit in the summer time, saying: "Of course in the summer a great deal of the alfalfa goes to waste; but there is less risk of running short of feed in the winter, and it is this letting the alfalfa grow up to its full growth each summer that insures to it a great number of years of life."

Both these gentlemen have been very successful in their respective localities. Yet this system of grazing and one cutting is comparatively little followed in Argentina. Alfalfares are usually used altogether for hay or altogether for grazing. Only occasionally do ranchmen put up hay in the pasture with a fence around it, to be taken down in the winter to allow cattle to eat when they need it.

YIELD AND PROFITS OF ALFALFA AS HAY.

The yield per acre varies greatly in different seasons and localities. In central, eastern, and southern Buenos Aires three or four cuttings per year are considered good, and it is the exception to get five cuttings. The amount secured varies from 1,500 to 3,000 pounds per acre, generally about a ton per cutting the country over.

In southern Cordoba, in a great part of the Province of Santa Fe, and in western Buenos Aires alfalfa grows more rapidly and the yield per acre is much greater. Four to eight cuttings are secured every summer, and five to six cuttings is the average in good seasons in the best regions. Four cuttings is the general average to be relied upon. If rainfall is abundant, more will be secured. If the summer is dry, there may be only three cuttings.

An estimate^a of the cost of making alfalfa hay and its value in the Jewish colony at Mosesville, about 100 miles northwest of the city of Santa Fe, is given herewith, converted into United States terms and with values expressed in United States currency:

Price in stack, per ton	\$2.40
Cost of cutting, per acre, with machine	\$0.36
Raking, gathering, and stacking, per acre .....	.71
Cost per ton, at 1 ton per acre	1.07
Net profit, per ton	1.33

Alfalfa in this region, for cutting exclusively, gives from five to eight cuttings per year. The average annual yield is better than 6½ tons per acre, so the farmer gets, in round numbers, from \$6 to \$10 per acre per year, or an average of \$8.65 for the use of his land, horses, and machinery, all other expenses of the harvest being paid out of

^aFrom the monthly "Anales" of the Argentine Rural Society for January, 1903. It corresponds very closely to an estimate made later by the manager of the colony.



FIG. 1.—TWO-YEAR OLD SHORTHORN HEIFERS IN ALFALFA, NORTHERN PART OF PROVINCE OF BUENOS AIRES.



FIG. 2.—STACK OF ALFALFA CONTAINING 100 TONS, 60 MILES FROM BUENOS AIRES. IN FRONT IS "TROJA," OR ARGENTINE CORN CRIB.

the cost estimate of \$1.07 per acre, or per ton. Stock is never put on during the first year of growth there. They sow 23 to 27 pounds of seed per acre.

The cost of preparing for market or for export is given by the same authorities as follows:

	Cost per ton.
Baling with machine	\$1.60
Wire .....	.30
Hauling, 9 to 13 miles to station .....	.72
Loading cars .....	.22
Commission and various charges .....	.44
Add price in stack	2.40
	<hr/>
Cost baled	5.68
Freight to Santa Fe or Colastine, nearest river ports	1.75
	<hr/>
Cost at the Parana River	7.43

Prices in the Santa Fe and other upper-river markets at this time were about \$9.50 per ton, leaving a handsome profit to the buyers. The freight to Buenos Aires from the station nearest the colony, to which the haul would not be over 5 or 6 miles, is a little over \$4 per ton, and the distance is about 355 miles.

Much complaint is made of the high freight rates, which greatly retard the development of the hay industry. Prices in the Buenos Aires market were at this time and are now (December, 1903) about \$12 to \$13 a ton for the best alfalfa hay. During the winter of 1903, in the month of August, it was quoted there at from \$15 to \$19.25 per ton. The producers who had not previously sold their hay in the stack received much more than \$2.40 a ton for it then. Prices are better toward spring, and are higher nearer the city of Buenos Aires. Jewish colonists are going more into alfalfa, corn, and stock raising, growing less wheat, which has proved a failure in this region in recent years. The Italian and other farmers in that part of the country have done likewise and profited well by it. Farmers who have stuck to wheat have brought poverty upon themselves, while those who have done mixed farming, with alfalfa and corn and stock to eat it, exhibit every indication of prosperity.

LOSSES IN THE STACK.

Losses are sustained everywhere in the alfalfa hay business by the failure of the stacks to shed water. These losses are estimated at from 8 to 30 per cent of the total amount, depending upon how well the stack was made, how large it was, and how much rain fell. Sometimes in wet weather the outside of stacks to the depth of a yard must be thrown away when it is baled. This leads to large stacks, such as the one shown in the illustration (Pl. IV, fig. 2), which contains 100 tons and is well proportioned. Losses are also often suffered by rains coming on when the alfalfa is in the cock and ruining it altogether if the rain lasts any length of time.

MARKETING AND MARKETS.

Bales for export weigh 50 kilograms, or 110 pounds, and are made in United States steam presses. Very large bales, weighing several hundred pounds, are made in hand presses for domestic use.

Alfalfa hay is an important article of export from Argentina, and the increase of this trade is predicted by Argentine authorities. It originated in 1864, when, during the war with Paraguay, Argentina was obliged to send alfalfa for the horses of the allies, Brazil, Uruguay, and Argentina. This led to a trade in alfalfa hay with Brazil, though it did not amount to much until about 1890, in which year about 22,000 tons were exported. The amounts exported annually since, with the average values of the export product, were as follows: ^a

Exports of alfalfa from Argentina.

Year.	Tons.	Price per ton.	Year.	Tons.	Price per ton.	Year.	Tons.	Price per ton.
1891.....	33,073	\$12.25	1895.....	79,320	\$5.26	1899.....	116,401	\$9.61
1892.....	43,220	8.36	1896.....	115,471	7.52	1900.....	113,356	10.91
1893.....	58,998	10.44	1897.....	114,308	7.88	1901.....	104,851	8.85
1894.....	52,489	8.39	1898.....	125,148	9.61	1902.....	108,208	8.95

These prices are about the average market prices for the years quoted in the Buenos Aires market. It is said that the reduction in the amount exported during 1901 and 1902 was due to the fact that the English ports were closed to Argentine live stock during those years on account of foot-and-mouth disease in Argentina. This operated, for various reasons, to interfere with the exportation of alfalfa to that market. The principal markets for hay from Argentina are Brazil, England, and South Africa.

FEEDING ALFALFA HAY AND CORN.

Progressive cattlemen, almost without exception, as far as seen by the writer, are looking forward to the time when they must feed their steers with alfalfa hay and Indian corn to get the best results. The recent outbreak of foot-and-mouth disease in the country will check this movement somewhat, because it is likely to delay the reopening of the English ports to Argentine live stock. The animal sanitary law in Argentina is very thorough, and every effort is made to enforce it, to prevent the spread of the disease, and to exterminate it; but after the outbreak of 1900 seemed to have entirely disappeared it was about two years before the British Board of Agriculture would reopen the ports to Argentine live cattle and sheep. They remained closed from April, 1900, to February 3, 1903, and were again closed in May, 1903. It was thought that this would be only temporary, but the disease got out into the country and even made its appearance in

^a Argentine custom-house statistics, reduced to avoirdupois tons, and prices per avoirdupois ton in United States currency.

the great annual expositions of breeding stock in Rosario and Buenos Aires in September and October, 1903. The disease, while quite general in extent, was mild in character and disappeared in a few months.

Advanced stockmen are very generally agreed now that it will pay them to finish their export animals on dry alfalfa and corn and to give them dry alfalfa in the winter time if the pastures run low. The great majority agree, except as to how long they should feed the animals before shipping. Opinions on this point vary from two to six months. They all know that cattle fed only on grass or alfalfa lose on a railway journey, and lose still more from the time they arrive at the port of export if they are to be exported alive. They are more or less wild, and they do not know how to eat the hay and corn which is given to them in the export yard and on board ship. Consequently heavy losses are suffered by the exporters, who become very cautious and cut down on the price of steers not trained to eat corn. This feeding has been done on a small scale already with very profitable results, but the high price of corn has discouraged it. Corn has been worth from 30 to 35 cents per bushel on the farm the past two years, and has sometimes been worth even more. Some of the more progressive ranchmen are planning to raise their own corn for feeding and do it in a more intelligent manner and get better results than the average small farmer.

SUPERIORITY OF CORN-FED BEEF.

The proposition to feed dry alfalfa and corn has applied only to steers for export alive, but it is bound to be applied also to those destined for chilled beef, for experience is gradually teaching Argentine beef producers that a grass or alfalfa fed steer can not compete with a corn-fed steer. The latter will be sounder, more solid, and his carcass will cut up to much better advantage. The corn-fed beef is worth more to the pound, because it is firmer and has less water in it than that of animals fattened on green alfalfa or grass only. The increase in the number of chilled and frozen meat companies in Argentina is stimulating a demand among the first-named concerns for superior steers, and better prices are being paid. It is certain that they will pay more for corn-fed animals than for the soft alfalfa beeves. Whether or not they will pay enough more to warrant the expense of several months' feeding is not yet proved. But as soon as the English ports are open to Argentine live stock, feeding corn and dry alfalfa will be a general rule.

GROWTH AND PROFITS OF CHILLED-BEEF TRADE.

The business of producing fat steers in Argentina has been subject to more fluctuations than in the United States, but is now approaching steadier conditions. Alfalfa has been the chief factor in removing the element of chance from the industry. Its intelligent use has taken

away every risk from starvation in dry, cold winters. It has increased the production of good cattle and made the future supply certain; so that more chilled-meat concerns are entering the field, making a better market. The chilled and frozen meat companies now operating in Argentina are as follows, with their daily capacity:

Frozen-meat companies in Argentina.

Name.	Location.	Daily capacity.	
		Steers.	Sheep.
Sansinena.....	Buenos Aires.....	250	6,000
Las Palmas.....	Zarate.....	170	3,000
Drabble Bros.....	Campana.....	170	3,000
La Blanca.....	Buenos Aires.....	150	3,000
Cold Storage Co.....	La Plata.....	300	6,000
Sansinena.....	Bahia Blanca.....	150	3,000

One or two large chilled or frozen meat establishments will be completed soon in Rosario and one or two more in Buenos Aires. La Blanca and Sansinena at Bahia Blanca, listed above, are new. An American company has been organized to build one in Necochea, south of Buenos Aires, and it is understood this company will ship chilled meat to New York. Several other companies are being organized, as the older companies, the first three named, have been earning large dividends—from 20 to 40 per cent—while they controlled the market.

PRICES OF CATTLE AND SHEEP.

The competition of the chilled-beef companies and the shortage of the supply in the winter and spring of 1903 (the months from June to November) stimulated the price of both cattle and sheep in Buenos Aires. When the English ports were closed, in May, 1903, good export steers—and the best were demanded for this trade—were selling at from \$40 to \$50 each. As soon as the ports were closed prices fell nearly 20 per cent on cattle, but not on sheep. In four months these prices were nearly restored, while prices for sheep had been going up for eighteen months, and fat wethers were selling at \$5 to \$6.50 down to \$2.50 for common grades and \$1.30 to \$2.65 for lambs.^a

LATER CONDITIONS NOT SO FAVORABLE.

A decline in the price of sheep began in November, 1903, and continued until January, when the price began to recover slightly. The decline was about 33 per cent at its greatest, and in March, 1904, prices for the best types of mutton and lambs were still 20 to 25 per cent lower than they were in July or August, 1903; but were rising.

In December, 1903, the frigorificos suddenly reduced their operations. Some of them practically closed down for the time. The reason assigned was that the demand for Argentine chilled and frozen meat had fallen off in England, and that the prices of steers had

^aIn 1902 the average price of native sheep of 60 to 100 pounds weight in the Chicago market was \$1.25 to \$6.50, and for native yearlings and lambs \$2 to \$7.25.

advanced in Argentina until it was no longer profitable. The companies were making no profits. There had been a heavy decline in the market price of shares in the Argentine freezing companies. The result of this action was an immediate drop of from 15 to 25 per cent in the price of steers. There has been but little recovery in this price up to the 1st of March, 1904. When the cooler weather begins work in the freezing plants is resumed and prices of steers and sheep improve. A large number of fat young steers are ready to be placed upon the market there. Exporters, stockmen, and Government officials are endeavoring to find an outlet for this production. A shipment of Argentine chilled meat was rejected in Austria on some hygienic ground, but it is claimed by the Argentines that it was done because of the opposition of the agrarian interests. Argentines have been shipping some chilled meat and some live animals to other European ports during the past year, including Hamburg, Lisbon, and some of the Spanish ports. They are striving hard to develop a market on the continent of Europe for their various meat products, and are meeting with some success.

Steers come to market now usually about three years old, and this is a gain over former years, due to alfalfa. Formerly weight counted more than quality, and steers were kept on grass till they were four or five years old. Now the lighter, young beef is preferred, as in this country. The favorite weights are 1,200 to 1,400 pounds.

Feeders, about two years old or a little more and very thin, are bought for \$9 or \$10 per head, put on alfalfa pasture for six to ten months, and sold for \$30 to \$40. A good business is done by a few estancieros in buying up old work oxen in exceedingly poor condition, paying \$13 to \$15.50 for them, putting them on alfalfa for six to eight months, and selling them for from \$24 to \$30. Fairly good grade steers, three years old, fattened on alfalfa pastures, are now selling for \$40 to \$48 in the country stations in Argentina, and it costs \$4 or \$5 per head to get them to the slaughtering places in the ports. This does not include the taxes on sales that are levied in some of the provinces nor the taxes levied by the municipalities where the slaughtering is done. These taxes vary, but will amount to several dollars more. Nearly all of this type go to the "frigorificos," or chilled and frozen meat institutions, for export.

UNITED STATES BEEF TRADE AS COMPARED WITH ARGENTINE.

Very briefly stated, for comparison, the business of exporting steers from the United States is carried on about as follows: Good grade steers are procured, either from farther west or at home, and are fed mostly in the central corn States for Chicago, where most of them are shipped. Feeding to fatten usually begins at the age of from sixteen to twenty months and lasts from three to six months. Then they are shipped to Chicago to be sold. Freight rates range from 18½ to 35½ cents per 100 pounds in carload lots from the feeding places to Chi-

ago. From Nebraska points the rate is $30\frac{1}{2}$ to $35\frac{1}{2}$ cents; from Missouri and Iowa points the rates are usually about 22 to $23\frac{1}{2}$ cents, though a few points have as low a rate as $18\frac{1}{2}$ to 19 cents; Kansas rates are $32\frac{1}{2}$ to $37\frac{1}{2}$ cents, with but few shipments to Chicago; rates in the State of Illinois vary greatly, but are much lower than Iowa or Missouri rates. In the Chicago Stock Yards these animals pay 50 cents each commission charge and 25 cents each yardage. They must also pay for feed, but if they are shipped east for export on the day of arrival this is very small. In the Chicago yards steers are sorted for local slaughter, export, or eastern markets. Comparatively light young steers, weighing from 1,175 to 1,300 pounds, are wanted for export, and these sell from \$4.40 to \$6 per 100 pounds, live weight, though of course these prices vary widely at different times. The best steers, the special young "baby beeves," that bring the highest prices, are not exported, but are reserved for fancy beef in the large city markets. The export steers are, however, of a superior quality. Prices in December, 1903, in the Chicago market were: Low-grade export steers, \$4.40 to \$4.70; good export steers, \$4.70 to \$5.15, and for prime fat beeves of 1,175 to 1,300 pounds weight, \$5.15 to \$5.50. The freight from Chicago to New York is 28 cents per 100 pounds, live weight. If loading on shipboard is prompt, charges in New York are light, not more than in Chicago. The ocean freight rates to English ports are from 30 to 35 shillings (\$7.30 to \$8.50) per head. Insurance is one-half of 1 per cent, and steers are insured for \$50 per head, except "distillers"—those fed on distillery waste—which are valued at \$75 each.

No charge is made for the inspection by the United States Bureau of Animal Industry at the Chicago Stock Yards and at the port of export. Every animal is tagged and numbered, so his identity is never lost, and the record is so complete that if it becomes necessary the animal can be traced from the English slaughterhouse back to the farm on which he was raised or fattened. This record is sent to the Bureau of Animal Industry inspector in the foreign cattle market at Deptford, near London, whose business it is to watch the results of the slaughter of steers from the United States and report by cable the tag number of any animal showing any disease that requires investigation. The matter is promptly followed up from this end, so that quarantine or other precautionary measures may be taken if necessary. These precautions are taken by the United States Government for the protection of the cattle trade, to make certain that every animal, as well as the chilled beef exported, is in perfect condition and the accommodations on shipboard are of the most approved kind.^a

^aThe Argentine Bureau of Animal Industry inspects all cattle that are to be exported, first on the ranch before they are shipped and afterwards at the port of export. Inspectors are also stationed in all the chilled and frozen meat establishments and in the city slaughterhouses, to see that no diseased animals are used for food.

FINE CATTLE OF ARGENTINA IN SHOW AND AUCTION.

FAT STOCK SHOW OF 1903.

In May the Argentine Rural Society gives a fat stock and horse show, to which, for the first time, in 1903, was added an exposition of agricultural products. There is generally a lively competition for the championship in the fat steer class, though there is no such scientific feeding competition, exemplified in a single animal, as we have every year in the International Live-Stock Exposition in Chicago. The entries are made in lots of 8 animals, and while they are fed for exhibition, they are prepared under conditions approaching the normal, or what the average, progressive ranchman might do if he chose. These expositions have a positive influence upon beef production in the country, showing what may be done by breeding and feeding.

PRIZE WINNERS.

One man exhibited 9 lots of 8 animals each in the last show, and took first, second, and third prizes in a competition of 26 lots. All the prize winners were pure white well-bred Shorthorns, and so were most of the 72 animals shown by this breeder, Dr. Benito Villanueva, who is the presiding officer of the lower house of the Argentine Congress. The prize lot averaged 2,145 pounds each when they were weighed on the show grounds, and the exhibitor claims they had lost about 60 pounds each after they left his estancia, distant about 194 miles by rail. Of course these animals were tame, having been much handled and sheltered, so they lost less in transit than the average Argentine steer. These were born in January and February, 1898. This class was for steers of three, four, and five years, and most of them were from four to five. All of Doctor Villanueva's steers were dehorned, a practice in which he thoroughly believes, though it is not generally practiced in Argentina. Doctor Villanueva's manager, who prepared these animals for the show, told me that he took them off alfalfa pasture and fed them on corn and dry alfalfa and gave them shelter when necessary for ten months before the show. Part of the time they had the run of the alfalfa pasture also. These animals made a beautiful showing in the parade and overcame the prejudice of many breeders against white coats. This objection has been and is yet very strong among Argentine breeders. An incident in the pedigreed-stock show of last October confirmed it. A white bull won one of the principal first prizes, but in the sale that followed he sold for less than one-third the price of several others of his class, less than half the price of many, and was sold, in fact, for a very low price, though the only objection to him was his color.

The prize lot of fat steers was presented by its owner to the Chilean delegation, at that time on its official peace jubilee visit to Buenos Aires, and the animals were slaughtered, and the beef used on board the Chilean naval vessels then in the Buenos Aires docks.

AUCTION SALES.

The sales at auction of fat steers, held on the grounds, were very unsatisfactory to the exhibitors. Exportation on the hoof had been stopped by an outbreak of foot-and-mouth disease a few days before, and the "frigorificos" (frozen and chilled meat companies) evidently had an understanding among themselves not to pay the high prices which they had paid the year before. As these companies offer the only market for good steers, they have the producers at their mercy when they can agree. A few representative sales are given herewith, showing weights per animal in pounds, with prices per animal in United States currency:

<i>Shorthorns.</i>				<i>Polled Angus.</i>		<i>Flemish.</i>	
Weight.	Price.	Weight.	Price.	Weight.	Price.	Weight.	Price.
1,648	\$53	1,607	\$57	1,261	\$37	1,431	\$40
1,865	75	1,561	48	1,380	48	1,402	40
2,070	75	1,925	75	1,501	48	1,312	37
1,874	57			1,435	44		

FAT STEERS FOR SALE ONLY.

In this class 31 lots of 8 animals each were shown, all but one being Shorthorns and Shorthorn grades. This one group, weight 1,407 pounds each, was a Shorthorn-Polled Angus cross. Some of the weights and sales follow:

Shorthorns and Angus grades.

Weight.	Price.	Weight.	Price.	Weight.	Price.
1,285	\$37	1,753	\$53	1,407	\$48
1,349	37	1,570	48	1,543	53
1,519	40	1,594	48	1,587	53
1,949	53	1,495	48		

FAT COWS AND STEERS.

Twelve lots of fat cows were entered for prizes in a class admitting any age or breed. Two of the sales (Shorthorns) were: Weight, 1,521 pounds; price, \$37. Weight, 1,517 pounds; price, \$37.

The Polled Angus steers, of which six lots, 48 animals, were shown, made a very good impression. They were three and four years old, and, though lighter than the prize-competing Shorthorns, brought better prices in proportion to their weight, as the lighter-weight grade Shorthorns did also. Three lots, representing a cross of Flemish and Shorthorn, made fairly acceptable weights, but brought moderate prices. The Herefords, which up to 1901 had taken the championship in the fat-steer class, were not represented in any way. The Hereford does not seem to be gaining ground in Argentina, as the Polled Durham notably is and the Polled Angus to some extent.

SHEEP, HORSES, AND POULTRY.

The showing of sheep (Pl. V) was small. Two groups of Lincolns and three of "Black Faces" (Hampshire Downs), each of 40 animals, completed the sheep exhibit. The prize Lincolns, averaging 176



FIG. 1.—SHEEP IN THE PARK OF THE ESTANCIA SAN JUAN, PROPERTY OF DON LEONARDO PEREYRA, NEAR BUENOS AIRES.



FIG. 2.—PURE BRED DURHAM COWS ON PEREYRA ESTANCIA, NEAR BUENOS AIRES.

pounds, sold for an average of \$4.84 each. The "Black Faces," though much lighter in weight, sold for about the same.

The horse show, though not large, brought out some very good roadsters and saddle horses. The prices realized in the sales were not high, but a little above those in the show of the previous September.

Interest in poultry was shown by good exhibits of Dorkings, Plymouth Rocks, Light Brahmas, etc. A few ducks and turkeys were exhibited.

Not a pig was to be seen in the show.

HIGH PRICES FOR BREEDING ANIMALS.

The demand for the best Shorthorn blood is increasing in Argentina, and it is a better market for good young bulls than ever before. Every ranchman is trying to improve the standard of his herd, culling out the undesirable cows, getting as good bulls as he can afford to buy, and preparing to give his cattle alfalfa pasture, if not to finish them with corn and dry alfalfa. The aim of everyone is to produce steers for export, either alive or as chilled beef. This has multiplied the requirements of the country for breeding stock. There is no indication of a decrease in the demand, but rather of an increase, for the planting of alfalfa is more than doubling the carrying capacity of Argentine grazing land, while the building of new "frigorificos" insures better prices because of competition.

Dr. E. Ramos Mexia, president of the Argentine National Rural Society, expressed the opinion, in his address upon the opening of the annual show in September, 1903, that exportation of cattle alive from Argentina was an unstable business that could never compete with the "frigorificos." "With one-fourth the cost of transportation," he said, "chilled meat brings the same price as that sent on the hoof." The losses suffered by those engaged in shipping live steers from Argentina to England from February to May, 1903, when English ports were open to Argentine live stock, and the high prices for both steers and sheep prevailing since the English ports were closed to Argentina, are facts cited by Dr. Ramos Mexia in support of his statement.

SALES OF SHORTHORN BULLS.

In an auction sale in Buenos Aires November 4, 1903, a Shorthorn bull from the herd of William Duthie, just imported, was sold to Don Gregorio Villafañe, who is the leading Hereford breeder of the country, for \$7,260, the highest price ever paid for a bull in Argentina. Others in the same lot were sold for \$3,960, \$3,080, \$1,760, and so on, the lowest being \$380, and the average for the nine being \$2,479. Several other sales of English, Scotch, and Irish bulls were held in Buenos Aires during September and October, when the prices were from \$700 to \$3,500, and probably about 150 imported animals were

sold at these prices. These sales have continued at short intervals since that time, and high prices have always been realized for Shorthorns imported from England.

PRICES AT NATIONAL LIVE-STOCK SHOW.

At the time of the National Live Stock Show in Buenos Aires in September and October, 1902,^a the opinion was quite general that the prices then paid for breeding animals raised in the country would not be maintained another year. Both breeders and auctioneers said so. But, on the contrary, the sales at the recent show in September and October, 1903, brought better prices than in 1902, and under very discouraging circumstances. Foot-and-mouth disease had broken out in the show itself, as it was prevalent in the country. It is stated that 40 per cent of the animals on exhibition had the disease. Many animals were sold when they were actually afflicted, but it does not seem to have discouraged the payment of good prices. The disease is said to have been in a mild form, and but very few animals died. Those kept in pens in the open air were much less affected than those in stalls and, if they did take the disease, fell away much less than the carefully prepared show animals in the sheds. Animals brought up in the open field showed more vitality, and this is one reason for the high prices obtained for grade bulls bred in the open, without shelter. The average price paid for all Shorthorn bulls, pedigreed and grade, field bred and stable bred, in 1902 was \$372. In 1903 the average price of 483 Shorthorn bulls of all grades sold by one auction house was \$595. The total sales of breeding stock in this show were \$668,404, of which this house sold \$408,544, or more than 61 per cent, so the average of its sales is not far from the average for the entire show. The sales of 1903 exceeded those of 1902 by \$100,013, or nearly 18 per cent, though the number of entries was smaller. Every animal shown or sold in this show was born in Argentina, for this was a national show, and no animals except those bred in the country could be shown or sold on the grounds. This year's show, in September and October, 1904, may be an international show, when imported animals may be entered for prizes and for sale.

BREEDING-STOCK SHOW.

ENTRIES OF CATTLE, HORSES, AND SHEEP. *

The entries in the breeding-stock show of September and October, 1903, were as follows:

<i>Shorthorns.</i>	
Registered bulls	243
Registered bulls for sale only	184
Grade bulls	1,017
Registered cows	61

^aSee "The animal industry of Argentina." by Frank W. Bicknell, Bulletin No. 48, Bureau of Animal Industry, U. S. Department of Agriculture.

Grade cows	360
Registered Polled Durham bulls	7
Registered Polled Durham cows	5
Total Shorthorns	1,877

Herefords.

Registered bulls	47
Registered bulls for sale only	27
Grade bulls	39
Registered cows	28
Grade cows	34
Total Herefords	175

Other breeds.

Registered Polled Angus bulls	3
Registered Holstein and Flemish bulls	25
Grade Polled Angus, Holstein and Flemish bulls	32
Total	60

Total cattle, 2,112.

Horses.

Stallions:	
Riding	12
Light driving	56
Heavy	54
Light and heavy road, for sale only	48
Camp mares	90
Total horses	260

Sheep.

Merino rams	335
Merino ewes	80
Lincoln rams	275
Lincoln ewes	100
Southdown and Shropshire Down rams	40
Southdown and Shropshire Down ewes	20
Oxfordshire Down rams	30
Oxfordshire Down ewes	20
Hampshire Down rams	40
Hampshire Down ewes	20
For sale only:	
Rambouillet rams	121
Rambouillet ewes	50
Lincoln rams	188
Lincoln ewes	12
Oxfordshire Down rams	10
Oxfordshire Down ewes	20
Hampshire Down rams	30
Total sheep	1,391

PRIZE WINNERS AND PRICES.

The sales of prize winners in the pedigreed Shorthorn classes were as follows:

Born March 1 to December 31, 1900.—First prize and championship to Ladas 6th, red and white, born September 27, 1900, sold for \$4,840; second, a roan, sold last year for \$4,400; third, a roan, sold for \$2,508; fourth, a roan, sold for \$2,508. In this class there were 41 entries and 25 sales, at an average of \$1,466; the lowest was \$396 and the highest \$4,840.

Born January 1 to June 30, 1901.—First prize, red and white, sold for \$1,848; second, roan, \$1,364; third, roan, \$1,320; fourth, red and white, \$1,320. There were 45 entries, 34 sales, and the average was \$1,195 each; the highest was \$2,728 and the lowest \$352. Eleven bulls of this class were sold for \$1,140 or more each.

Born July 1 to December 31, 1901.—First, a white bull that sold for only \$748; second, roan, \$2,288; third, red and white, \$2,640; fourth, red, \$748. There were 91 entries and 57 sales, the average being \$1,088; the highest was \$4,840 and the lowest \$396. Twelve were sold for prices above \$1,540.

Born January 1 to June 30, 1902.—First, not sold; second, roan, \$2,640; third, not for sale; fourth, red and white, \$506. There were 20 entries and but 6 sales, as most of these young bulls are reserved for the next year's sales. The highest price paid was \$2,640 and the lowest \$418.

AUCTION SALES OF CATTLE, HORSES, SHEEP, AND HOGS.

Details covering about two-thirds of all the animals sold in the show indicate the general character of the whole, all sales being at auction. These sales, amounting to \$408,544 in United States currency, were as follows:

Number and kind of animals sold.	Amount of sales.	Prices per animal.		
		Average.	Highest.	Lowest.
Pedigreed cattle:				
198 Shorthorn bulls	\$186,175	\$940	\$4,840	\$386
10 Hereford bulls	4,777	477	1,320	264
4 Flemish bulls	1,826	456	660	264
Grade cattle:				
285 Shorthorn bulls	101,409	356	1,650	53
16 Hereford bulls	1,760	110	137	53
93 cows and heifers	9,750	105	286	26
Pure bred horses:				
10 Clydesdale stallions	6,820	682	1,342	264
9 Hackney stallions	4,576	508	1,430	264
2 Anglo-Norman stallions	668	334	334	334
13 Percheron stallions	9,328	718	1,364	374
8 Shire stallions	4,288	536	748	308
9 Yorkshire stallions	3,190	354	484	220
2 Hackney ponies	228	114	114	114
6 Hackney mares	2,028	338	396	242
Grade mares:				
16 cart mares	1,120	70	.....	.....
8 coaching mares	440	55	.....	.....
36 Clydesdales	4,356	121	.....	.....
12 coaching mares	552	46	.....	.....
8 Hackney mares	352	44	.....	.....
6 female asses	158	26	.....	.....

Number and kind of animals sold.	Amount of sales.	Prices per animal.		
		Average.	Highest.	Lowest.
Sheep:				
217 Merino rams	\$41,996	\$194	\$1,760	\$15
25 Merino ewes	352	14	18	13
142 Lincoln rams	17,318	122	1,056	44
18 Hampshire rams	1,848	103	264	75
30 Hampshire ewes	858	29		
1 Shropshire ram	75			
5 Shropshire ewes	286	57		
15 Oxfordshire Down rams	1,553	104	154	4
Hogs:				
4 male and 4 female Yorkshires	680	85	101	79
3 Berkshire boars	123	41	44	40

A new ruling of the Rural Society requires the auctioneers to collect their commission of 6 per cent from the buyers, who pay cash, and the auctioneers must pay 2 per cent of their commissions to the society. Auctioneers' commissions are now always paid by purchasers.

Herefords and Polled Angus were rather poorly represented, and prices, it will be noticed, were far below those obtained for Shorthorns.

One breeder sold 26 young pedigreed Shorthorn bulls for an average of \$1,310 each. Another sold 24 "camp" bulls, with which no special pains had been taken, for \$924 each. Several other breeders did nearly as well with Shorthorns. The sales were all extremely satisfactory.

The development of the dairy interest continues, and the exhibits and attention paid to this department by the people excelled the previous year. The demand for dairy machinery and appliances is very active.

The popularity of the Merinos is also shown by the sales. The average price for Rambouillet rams in 1902 was \$159, while this year (1903) it was \$194. One ram sold for \$1,760 and another for \$1,408. The former is the highest price ever paid for a ram born in the country. The highest price the previous year was \$880. The lot of 10 to which the two mentioned belonged averaged \$422 each. The sire of these rams was imported from Germany in 1900 and sold for \$2,464. In 1903 335 Rambouillet rams were shown, against 304 the previous year. In Lincolns 832 rams were shown in 1902, and only 463 in 1903. The average price in 1902 was \$99, and in 1903 the average of one auctioneer was \$122, the higher prices being no doubt due to the smaller number offered. The champion Lincoln ram in 1902 sold for \$704, and in 1903 the champion brought \$1,056 and another one \$880. In January, 1904, a Lincoln ram lamb, bred in the country, sold for \$4,600 paper (\$2,024 United States money), the highest price ever paid for a native Lincoln ram in Argentina.

Horse sales were about the same as in 1902, but prices were slightly better for the best of the draft animals and for the light roadsters, but lower for the common "camp" mares.

A few pigs were offered, but most of the classes were without entries

IMPORTS OF BREEDING STOCK.

Imports of pedigreed stock into Argentina for breeding purposes have been as follows since 1896:

Annual imports of animals by classes.

Year.	Cattle.	Sheep.	Horses.	Asses.	Pigs.
1896.....	988	7,305	163	116	105
1897.....	916	7,309	184	71	25
1898.....	623	6,962	154	31	2
1899.....	1,561	4,839	129	7	19
1900.....	938	9,165	203	74	3
1901.....	26	154	441	15	5
1902.....	64	272	30	22	19
1903.....	653	1,877	51		

The classification of the principal breeds was as follows:

Imports of cattle by breeds.

Breeds.	1899.	1900.	1901.	1902.	1903.
Durham.....	502	300		32	572
Hereford.....	46	14		6	31
Polled Angus.....	25	6		4	38
Red Shorthorn.....	314	118		7	

Imports of sheep by breeds.

Breeds.	1899.	1900.	1901.	1902.	1903.
Lincoln.....	3,597	1,869		271	1,179
Rambouillet.....	485	269	61		
Hampshiredown.....	381	64			253
Shropshire.....	284	123			299
Oxford.....	103	50			44
Romney.....		38			71
Leicester.....	30				25

These statistics were prepared by the Bureau of Statistics of the Argentine Department of Agriculture.

HANDLING CATTLE IN THE "BRÉTE."

While there are many wild cattle in Argentina that have never felt the civilizing influence of improved blood or modern treatment, these are not the ones with which the world's beef markets are concerned. The best steers are mostly unfamiliar with any feed but grass and alfalfa and are provided with no shelter, but they are more or less tame. They are not the wild, racing creatures we have read about

and seen pictured in the geographies. The well-managed estancia has its cattle well in hand, keeping close account of them and handling them frequently, so they become more or less tractable. They are often sorted and separated into different lots for feeding on different pastures for market at different times. Then there is the branding, the vaccination for anthrax, the castration, sometimes the trimming or removing of horns, and various other operations. All these things, if properly done, teach the animals not to fear being handled and make them better travelers when they go to market by rail or sea, or both. This training, when supplemented by a little feeding on dry alfalfa and corn, gives the steer raised by modern methods an immense advantage over the wild animals that find their way to Buenos Aires, especially if destined to go on board ship for transportation to markets over seas.

The wild creatures wear themselves out trying to break away. They are in abject terror of everything near them, for they have never been restrained in any way before. Everything is new, and they do not understand that they will not be hurt, as the better trained animals do. They have never seen any dry food, and for days they do not eat. In the meantime the corral-broken animals are not losing, but are eating all they can get, including the portions of their frightened companions, and are gaining flesh from the moment they are unloaded from the trains that bring them to Buenos Aires. They are accustomed to being handled in close quarters from their calfhood, and they fear nothing.

The most necessary handling of the wilder steers was formerly done by means of a long rope lassoed around the animal's horns and passed around two upright revolving posts. The animal was then dragged to the posts by a horse and held there with much difficulty and more or less brutality while any necessary operation was performed. Naturally this does not tend to quiet the animal's fears or make him tame. It is

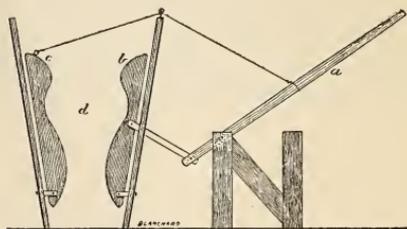


FIG. 1.—The yoke of the bréte. This yoke is placed inside the framework of the narrow chute, at the end nearest the scale. When the animal, released from behind, puts his head through the opening *d*, the man stationed at the lever, *a*, quickly pushes it down. This action closes the arms of the yoke, *c* and *b*, upon the animal's neck. The lever pushes the arm *b* and, by means of the wire running from the arm *c* over the top of the bréte to the lever *a*, pulls that arm, so they close quickly and simultaneously. After the desired operation is performed upon the animal, the lever is thrown up and he is released. The triangular swing gate is swung to permit the animal to pass to the scale or to the paddock, as desired. After he is weighed, the gate at the end of the scale may be adjusted to turn the animal either way, to the right or left, and in this way they are sorted. On the other side of the bréte, behind the yoke, is another lever, similar to the one shown above, by which the animal may be held more closely by having an adjustable board pressed firmly against him, forcing him against the operating side of the chute, where he is already held by his head, or neck.

still done on some of the old native estancias, where modern methods have not been adopted, and the only question asked about a bull is whether or not he is capable of performing his function. But the

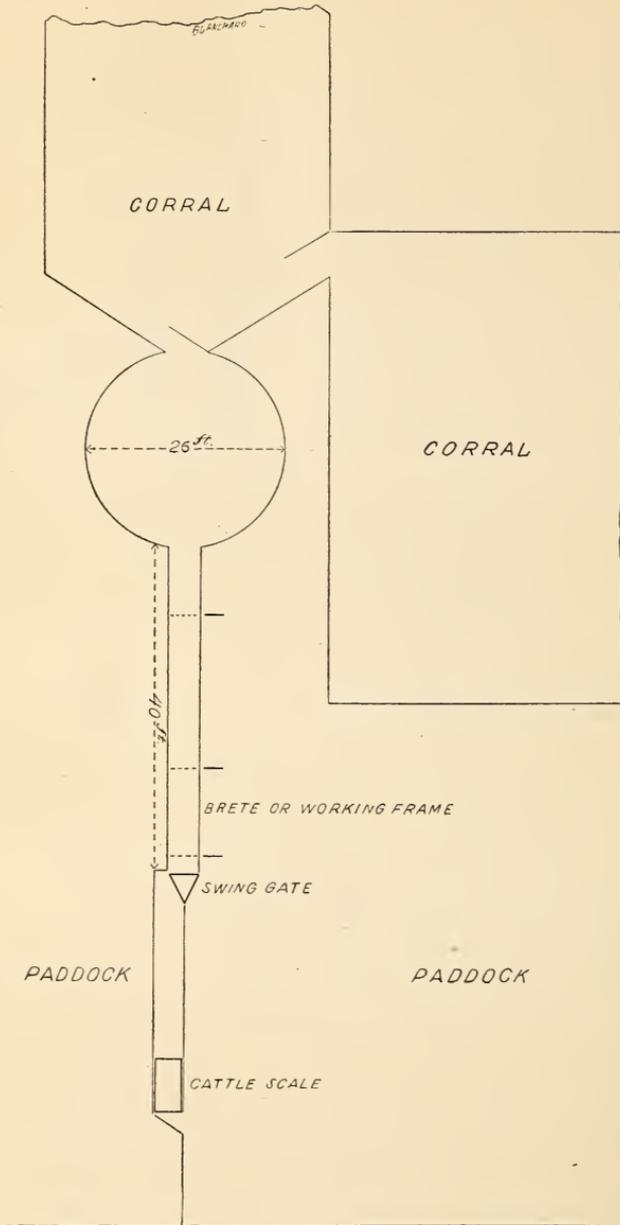


FIG. 2.—Ground plan of the bréte.

more progressive, and hence more successful, estancias have adopted an idea which came from Australia and has proved of great value where large numbers of cattle are to be handled frequently.



FIG. 1.—CORRALS LEADING INTO BRÉTE.



FIG. 2.—WORKING SIDE OF BRÉTE.



FIG. 3.—BACK SIDE OF BRÉTE.

DESCRIPTION OF THE BRÉTE.

This improved method or apparatus is called a bréte (Pl. VI), and it is a simple piece of stout framework which may be made by any farmer if he will give it a little study and get the right materials. Briefly, it is a long chute opening out of a small round corral, and that from a larger one by a gate 12 feet long. This chute is just wide enough for one animal to pass, so he can not turn back or crowd ahead. It has crossbars worked with levers at several places to hold the animals and prevent them from backing out. At one place there is a working frame, where the animal is held securely in the embrace of a yoke (fig. 1) which closes in upon his neck, and any sort of operation may be performed upon him with perfect

ease and without unnecessarily hurting the animal or allowing him

to hurt himself. Thence he goes to the scales to be weighed, or, if not desired to weigh him, he passes by an adjustable gate into whichever corral his presence is

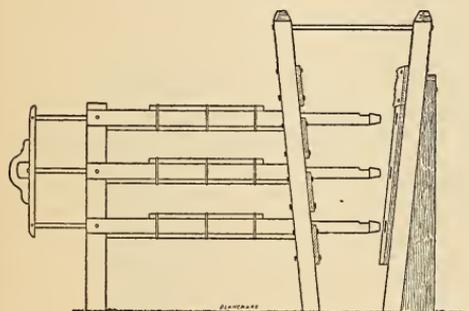


FIG. 4.—End view of bréte with closing bars.

desired. This is a rapid, easy, effective, and humane process, and the expense of building the bréte is not great. Many estancieros make a practice of putting their cattle through it often, so they will be accustomed to being handled. They say it makes them less wild, and they do less running in the pastures.

A ground plan of a model bréte on the Estancia Victoria, near Caracaraña, the property of Mr. Henry B. Coffin, a progressive North American breeder, is given herewith, together with some illustrations (figs. 2, 3, 4, and 5) showing how the details are arranged and how the apparatus is operated. The dimensions are given, so that construction may be made from this plan. The whole shows a very

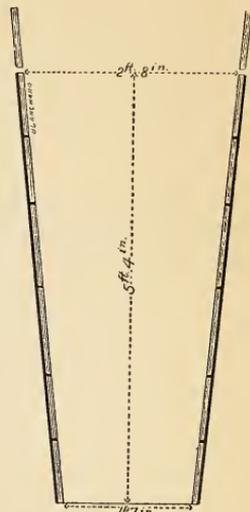


FIG. 3.—Section of the bréte, hardwood posts 6 by 6 inches, sunk 3 feet 6 inches in the ground.

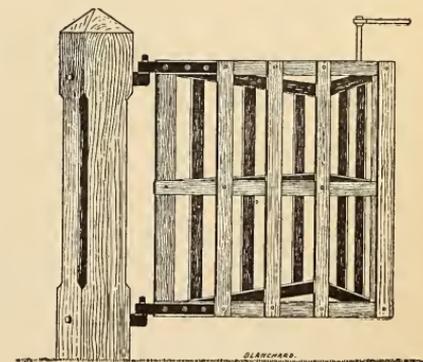


FIG. 5.—Triangular gate at end of the bréte.

conveniently arranged system of corrales for the handling of large numbers of stock where classification is desirable, and this classification is regarded as an important feature of estancia management in Argentina. The woodwork of the bréte should be of strong, straight-grained hard wood, well put together with bolts and iron braces, especially the bréte itself, or working frame, where the animal is handled, so its operation will be certain and quick, with no chance for it to get out of shape.

DEHORNING IN THE BRÉTE.

Dehorning may be done in the bréte better than in any other way, but comparatively little of it is done in the country. The practice is more likely to be that of applying acid to the embryonic horns of calves, if the breeder thinks it worth while to get rid of horns. Many do not see the advantages of hornless cattle and claim that steers can be handled on shipboard better with horns than without. A steer without horns will bring a little more than one that has them, however. Three or four more cattle can be put into a car if they are without horns. They travel in better condition, and the difference in the hides is quite noticeable. The advocates of dehorning are increasing and so is the interest in the hornless breeds, particularly Polled Durhams. The prize fat steers shown in May, 1903, by Dr. Benito Villanueva, were all without horns, and his firm belief in the policy of dehorning has had quite an influence.

