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SUCCESS WITH HOGS

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BY
CHARLES DAWSON



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THIS BOOK IS
DEDICATED TO MY FATHER

H. C. DAWSON

THE PIONEER WHO HELPED TO BLAZE
THE WAY IN SWINE HUSBANDRY FOR
OVER FIFTY YEARS, BREEDING, FEED-
ING AND SHOWING THE SPECIMENS OF
HIS ART, A MASTER BREEDER, WITH
THE HOPE THAT IT MAY BE ALL THAT
HE DESIRED TO LEAVE FOR OTHERS TO
READ AND PROFIT BY

PREFACE

IN preparing this book the author's endeavor has been to compile a broad, common sense, readable and practical treatise upon the correct and hygienic principles of feeding, care and treatment of swine, with the hope that its study would tend to aid and simplify the practice of the three cardinal principles of hog production — Right Breeding, Right Feeding and Right Caring of Swine.

The material in this volume has been secured from the author's lifetime experience with hogs and association with hog men, in practically all phases of the business — breeding, feeding, selling, exhibiting, judging, producing serum, and many years' service in the field of investigating, advising and treating ailing swine. He was also for years associated with his father, H. C. Dawson, one of the originators of the Poland-China breed of swine.

The author is especially indebted to N. H. Gentry, Sedalia, Mo., Prof. John M. Evvard, Ames, Iowa, and to a host of other practical, successful hog men, who have taken personal interest in the attempt to make this volume complete.

CHARLES DAWSON.

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SUCCESS WITH HOGS

CHAPTER I

THE HOG MAN

REAL hog men are not necessarily born nor bred, but are generally injected into the business through causes of necessity, and are schooled and graduated by years of costly experience. Most hog men eventually grow only to fit into their own local environments, within the scope of their horizon, and to adhere to the teaching alone of their own experiences. On the other hand, many hog men become broader minded in outlook and practice, able to grasp and utilize the better and proven methods of hog production. These men, naturally, become the type and breed improvers.

There exists a striking resemblance between the different kinds of breeders and their herds. The fixed high standards of type and breeds of the present day have been accomplished by many years of studied labor and by progressive and constructive breeding, while the low and conglomerated standards represent the erratic, careless and ignorant results of the experimental, indifferent and oftentimes ignorant or destructive breeding. The latter are responsible for the retrogression of type and general low utility of the breed. They are the negative forces, working against the efforts of the constructive breeders, or positive forces.

The great middle class of pork producers comprises the ones who, meaning well, endeavor to produce successfully, but whose methods are generally too loose, with perhaps a range of types and breeds too wide, the base of operations too broad and experimental, accompanied with a laxity of personal attention and observance of the laws of proper breeding, feeding and sanitation to be always successful.

The greatest qualification of a successful hog raiser is a natural liking for all animal life. A man who loves beauty in animal form, who takes pleasure in actual contact and care of his animals, a man who by intuition notes of their daily condition and response to his care and feeding, coupled with the ability to judge and foretell the results of the use of any certain method or procedure of breeding or feeding, endowed with a big fund of perseverance and content to accept what rewards fortune may bestow, whether remunerative or otherwise, may be termed the real hog man.

The Golden Text for successful production of hogs is Breed Right, Feed Right, Care for Right. The fundamental rule of observance is to follow Nature's teachings. Every plant that grows, every animal that lives, has its own peculiar process of development, from conception to maturity. Nature has outlined every step to the minutest detail.

Every departure from Nature's laws, whether voluntary or man made, in any period of the hog's life, will eventually have to be reckoned with and accounted for, not alone in the individual's welfare, but also in that of his progeny. Thus the sins of the fathers and mothers have effect even unto the seventh generation.

There is no question but that the continued unnatural environments and methods of domestication have indelibly stamped all breeds and types of hogs with lower

states of vitality, constitutional vigor and stamina, and have burdened them with practically all known ailments and diseases. Thus as a breed of animals, hogs have become more susceptible and of considerably lessened power of resistance to diseases. Such conditions result in increased fatalities and lessened productiveness of finished animals, and account largely for a low percentage of prolificacy, weak born litters, and high mortality of pigs, from conception to pig maturity, especially during the period of birth and through the suckling period.

While it is impossible to restore to hogs their primeval environments, we can substitute much of them so far as practical. The time is at hand for the universal adoption of correct breeding, sanitation and feeding methods. The continuance of yesterday's practice in hog raising will soon bring about the question of saving them from species extinction as meat producing animals. To verify these statements note the increase of condemnations at slaughtering centers and the correspondingly higher percentage of diseases and fatalities throughout the whole pork producing territory.

Success will attend scientifically planned and arranged methods, based on Nature's basic laws, coupled with cleanliness, balanced feeds, interested personal attention with occasional application of brains.

There is no longer a place in the business for the indifferent hog man. The present and future demands men who will make it a scientific study and business, men who will cause two pigs or two hundred pounds of pork to grow, from each producing unit, where formerly but one grew. It does not take vast acres or numbers of units to produce hogs. Study and work are the key to success, and the man of the future who applies these on small aced farms, coupled with the growing of di-

versified crops and stock, will become known as a nation builder, the backbone and sinew of business, not just as a farmer and hog raiser, but as a scientific, expert producer of live stock.

CHAPTER II

THE HOG FARM

THE ideal hog farm need not necessarily be of vast acreage, as more depends upon how the acres are arranged and worked than upon their number. Twenty to eighty acre, well managed farms are more recommendable than two hundred or more acre, badly managed ones. Nearly every farm can be arranged to be almost ideal.

Of first importance is the drainage problem and water supply, followed by the adaptability of the soil to produce staple hog-feeds, such as corn, wheat, oats, barley, alfalfa, clovers, etc. If possible the whole farm should be fenced hog tight, with the central feeding and housing yards placed where there is good natural drainage, and in close proximity to a pure water supply. Groves of native or planted timber are excellent for purposes of shelter and shade, and good drainage prevents the collection of stagnant water and mud holes.

Adjacent to the central yards and buildings should be several large sized yards for pasturage, arranged in crop rotations of alfalfa, clovers, rape, rye, etc., to furnish sufficient succulent forage feeds for the hogs during nearly every month of the year. It is not always advisable to arrange feeding yards on the banks of streams, especially those of a sluggish nature or that originate far beyond the premises. Where practical, the shelter houses and feeding floors should be arranged on the sheltered or sunny side of groves and hills, taking every

advantage possible of natural conditions of wind breaks, drainage and sunshine. Well arranged hog farms almost keep themselves sanitary and clean.

The water supply is of great importance. Hogs naturally drink water many times a day and all farms should be arranged so that the hogs have plenty of clean water accessible at all times. They should never be allowed to drink from stagnant pools, mud holes or from unclean places. Supply tanks and hog waterers may be arranged in connection with wells and springs so there may be an abundance of pure water in order that the hog will not be forced to resort to his own initiative to secure water of unknown purity. Many ailments and diseases have their inception from dirty, disease germ laden water.

Hogs require shelter throughout all seasons of the year. There are many types of buildings recommended and used, the majority proving satisfactory. The essentials of such buildings are convenience, dryness, winter warmth, air tight floors with plenty of pen room, an even temperature, well arranged sunlight, sanitation and ventilation. The windows and doors should be arranged to give the maximum amount of light and ventilation, and the minimum amount of draught or air currents over the sleeping hogs. The material used in the construction of the buildings should be durable and of a nature to be easily cleansed and disinfected. Whether these houses be of the large, central or individual type is largely a mere matter of personal preference. The cost of the house is immaterial to the securing of the essential features. A good \$200 hog house is better than a \$2000 badly constructed one. Where hog farming is conducted on a large scale, it is well to have a combination of all kinds, using the central house for farrowing in inclement weather, for the storing of foodstuffs, and the housing

and feeding of pigs during other seasons of the year ; with the smaller, individual, or " A " shaped houses, scattered about over the premises in different yards to provide shelter for individual hogs, and for the brood sows and litters during the more open seasons. Wood is generally preferable as material for the construction of hog houses, with the floors of hollow tile or concrete, and the feeding floors of concrete. The objectionable cold feature of cement floors during farrowing time may be overcome by using false wooden floors during this period, and the wintertime.

Many hog men are adopting the hollow tile and cement block-constructed houses, which are proving highly satisfactory when built properly.

All floors of the hog houses should be arranged with sufficient slope for drainage and of roughened contour. Every hog farm should have concrete feeding floors located in some sheltered spot accessible to the main water and feed supply. In the summertime hogs need open, floorless, sideless sheds for shade and shelter. These should be placed conveniently in the different hog yards, preferably on slight elevations with good drainage and in open air currents. Other important essentials are sanitary built and kept troughs and other feeding utensils on the hog farm. The sanitary conditions of all buildings, sheds, floors, etc., are always of more importance than their cost or adaptability for use.

Success in swine husbandry does not always depend upon the ideality of location, fine improvements, or large investments ; nor with the man who has not the ideal location, capacity, improvements or investment, or with him who overstocks his pork producing plant manyfold its capacity.

Success more often attends the labors of the man who

has limited capital, the man who must do the best he can with his location, improvements, breed and foodstuffs. In short, good hog men are created more from necessity than from choice.

CHAPTER III

THE HOG

NATURALISTS unitedly agree that hogs are descendants of a common ancestry, still represented by the wild hog species, found in the wooded or mountainous regions of the Old World, being known scientifically as of the Suidea branch of the mammal or Pachydermatous family, characterized by their short muscular snouts, which are very sensitive to touch and scent, and usefully employed in search of food, and as being a four-footed animal, usually having two pairs of toes on each foot, the front ones being much larger than the hind ones, which act more as secondary supports than as toes.

The primitive hog existed in two distinct species or types, the wild hog of Northern Europe and Asia being called *Sus-Scofra* or *Sus-Aper*, with the hog habiting the southern latitudes of Europe and Asia, known as *Sus-Indica*. It is believed that the latter may have been descendants of the wild hog of the northern latitudes.

The first domesticated hogs of America were brought from Spain, Portugal and England by the earliest explorers and colonists. The early settlers of America paid very little attention at first to the welfare of the hog, it being the custom to allow hogs to run at large, exposed to elements and danger, seeking their own livelihood, consequently they did not develop to any extent until after the Revolutionary War. The hogs that really were the basis for the formation and improvement of existing

American breeds came from England during the latter 1700's and early 1800's.

England, during this period, was also founding and improving new breeds of swine, securing individuals of different types and species from foreign lands to cross and secure the desired results upon her existing types and breeds. The original English types were believed to be direct descendants of the wild hog, being described as of medium large size, especially heavy and over-developed head and shoulders, the head and snout very long, the males having large tusks, heavy shields and long coarse bristles over crest and neck, the hind quarters much smaller in proportion to body and fore quarters with barely normal capacity for the digestive organs, in fact, the intestinal tract was only one third the length of the present day domesticated hog. Therefore, they were hard feeders and of extremely slow maturity, yet hardy and strong, possessing great heart and lung capacity, and they oftentimes lived to be 22 to 30 years of age, but they only produced one small litter of pigs annually, which they mothered and protected until nearly one year old. They rarely matured into full stature until three or four years of age.

The Sus-Indica was the direct opposite in practically every characteristic, it being a smaller, thin-skinned, early-maturing, prolific and gentler hog, producing meats of higher finish and quality. The little black hog of Siam, of this species, had perhaps the greatest influence in improving the large coarse English breeds. The White hog of China was also largely used to improve the fattening and maturing qualities, in fact, all present day white hogs trace back to this early breed.

The Neapolitan and Essex were later breeds of Siamese origin. And the old English White hog, the Byfield, the Leicestershire and other early English breeds,

which were designated by the name of the county or shire they were produced in, were descendants of the Chinese Hog crossed upon local prevailing types and breeds.

The origin and characteristics of the various prevailing breeds of swine are described in the pages following.

CHAPTER IV

THE POLAND-CHINA BREED

THE Poland-China is a breed of truly American origin, being the pioneer of all large types of American hogs, and being evolved from practically all of the early day types and breeds, by many years of the master efforts of America's best constructive breeders, into the present day standard of perfection in large type hogs.

The popularity of the Poland-China all over the United States perhaps excels that of any other breed in numbers and satisfaction from a profit standpoint. The Poland-Chinas took recognized form first in Warren, Butler, Union and Wayne Counties, Ohio, during the early 1800's. The predominating types and breeds existing in the colonies prior to this period were of a nondescript nature, from the half wild hog descendants of the earliest importations to later breeds of higher pork-producing qualifications.

The Bedfords from England were among the first of the imported forebears of the Poland-China breed. Washington imported some of these hogs in the early 1800's, and the China hog was imported in about 1805. The Bedfordshire was a large spotted, sandy colored, lop-eared, well-framed, good traveling and very slow-maturing hog, and the China, while mostly white, was sometimes spotted and somewhat similar to the Bedfordshire in conformation.

The early Berkshire was of a reddish sandy and spotted

color, of a very similar conformation to the Bedfordshire, as was also the "Grass breed" of an unknown origin.

The Byfields were a very large spotted hog, sometimes nearly white, having heavy lopping ears. The Russian hog was a generally white colored, coarse featured, coarse haired hog of good length and large bone, during the 1830's and 1840's.

Eventually there evolved a type from the blending of these breeds during the early 1800's which was a large, well-built, prolific, easy-feeding, early-maturing, spotted, colored hog. It is commonly believed that the Spotted Poland-China of the early day is really the result of holding to and breeding back to the color marking and type of the Big Spotted China.

The Irish Grazier, true to name, was introduced from Ireland about 1834, and was used to secure new infusion of blood, after which it soon lost identity as a distinct breed.

The first recorded importation and use of the Berkshire occurred in 1832. They were used largely by the Shakers of the Miami Valley, to whom much credit is due for the founding of the Poland-China breed. John Wallace, a Shaker living near Union Valley, secured some Big China hogs and crossed them upon his herd of Byfield and Russian hogs in the year 1816. These China hogs were entirely white of color. Later on, the Siamese, Neapolitan and Essex were used to secure a better fattening and maturing quality. This and the Improved Berkshire infusion also aided greatly to make the color more uniform, but the infusion that really fixed the color as spotted, white and black, and latterly, black with six white points, was by Tom Corwin, 2nd, the noted Poland-China boar, who undoubtedly carried considerable Improved Berkshire blood in his veins.

The prevailing hogs of this Miami Valley region during

the constructive period of the breed were designated usually by place of habitat, origin and name of breeders. Thus the Warren County, Miami Valley, Butler County, Magie Hog, Shaker Hog, Polands, Great Western Chinas, Spotted Chinas, etc., were the original Poland-Chinas.

After many years intervene much history becomes legendary and confusing, hence we can only draw conclusions that the Poland-China resulted from the crossing and recrossing, aided by selection in breeding, of the above early-day breeds during the early 1800's, up until perhaps 1840-45, when they began to take definite form as a distinct breed without further infusions, excepting that of the Improved Berkshire.

The honor of the origin or the naming of the breed cannot be rightfully credited to any one man, as the breeders, like the breed, were very cosmopolitan. However, to David Magie, John Milliken and John Harkrader, along with a host of other breeders, too numerable to mention, pioneer honors as constructive breeders are ever due.

Contrary to print and legend, there does not exist a true known origin for the naming of the breed as Poland-Chinas, unless it be from the result of a compromise at the first breeders' meeting held during the early 1870's. This was latterly ratified at a meeting in Indianapolis in 1872. This action piqued David Magie so greatly that he refused to join the newly formed Record Associations and ever afterwards called his hogs "The Magie Hogs."

The first Record was founded by Carl Friegau, of Ohio, in 1877, which was called the Ohio Poland-China Record Association. The American Poland-China Record Association was formed in January, 1878. Since that time, the National, Central, Standard and South-

western have been organized. The American at Chicago, Ill., National at Winchester, Ind., and the Standard at Maryville, Mo., are the present leading Poland-China Record Associations.

POLAND-CHINA SCORE CARD ADOPTED JUNE, 1896

This should be interpreted more for show yard type than for breeding animals.

	Counts
<i>Head:</i> Even, slight, short and dished	4
<i>Eyes:</i> Full and clear	2
<i>Ears:</i> Medium, well attached and controlled	2
<i>Neck:</i> Short, wide, even, arched and full	2
<i>Jowl:</i> Full, broad, deep and firm	2
<i>Shoulders:</i> Broad, oval at top, good width and smooth....	6
<i>Chest:</i> Large, wide, deep and full. No creases	12
<i>Back and Loin:</i> Broad, straight or arched loin, well developed	14
<i>Sides and Ribs:</i> Full, deep, firm and no creases	10
<i>Belly and Hank:</i> Broad, straight and full	4
<i>Ham and Rump:</i> Broad, full, deep, well developed	10
<i>Feet and Legs:</i> Medium size and length, straight and of good texture	10
<i>Tail:</i> Medium length and size, tapering, carried in curl....	1
<i>Coat:</i> Fine, straight, smooth, close lying	3
<i>Color:</i> Black with 6 white points	3
<i>Size:</i> Large for age	5
<i>Action and Style:</i> Vigorous, easy and graceful	3
<i>Condition:</i> Healthy, skin clean, flesh evenly laid	2
<i>Disposition:</i> Easily handled, kind and responsive	2
<i>Symmetry of all points.</i> Combined to make desirable animal	3
Total	100

CHAPTER V

THE BERKSHIRE BREED

THE Berkshire hog was originated in the Counties of Wells and Berkshire, England, being well established as a breed prior to 1800. They were of great size, some attaining 1000 to 1100 pounds, reddish brown, sandy, spotted white and black in color, deep chested, flat sided, long bodied, coarse headed, lop-eared, curly, coarse coated, and of slow maturity.

During the early 1800's crosses of the Siamese, Chinese and Neapolitan were made on the old style Berkshire, which with careful breeding evolved a type smaller, black and white of color, smaller boned and of quicker maturity.

The first American importation was made by John Brentnall to New Jersey in 1823. This was followed by many others, resulting in the Berkshire reaching the Corn Belt region during the early 1830's and 1840's. Importations of the Improved Berkshire did not take place until several years later. These with the earlier importations were improved upon by America's best constructive breeders of the period, which latterly fixed the breed.

The leading characteristics of the Improved Berkshires are: constitutional vigor, hardiness and activity, strong digestive and assimilative powers, prolificacy and motherhood, feeding and maturity qualifications, adaptability to foods, climates and of producing either bacon or lard meats. The present Improved Berkshires are of good size, both in frame and bone, and are good grazers, hence

do not arrive at finish as readily as do some lard breeds, but the quality of their finished meats is of the highest. The Berkshire really should be classed as a bacon hog.

The most noted improvers of this breed during recent years are N. H. Gentry of Sedalia, Mo. (a master constructive breeder who has bred his own herd boars for over 30 years), A. J. Lovejoy of Roscoe, Ill., and I. N. Barker of Indiana.

The present Berkshires are very popular with breeders, feeders and packers of the great Hog and Corn Belt.

The only record is The American Berkshire Record Association at Springfield, Ill.

BERKSHIRE SCORE CARD

	Counts
<i>Color:</i> Black with white feet, face and tip of tail	3
<i>Head:</i> Short, wide, clean and free of wrinkles	7
<i>Face and Snout:</i> Face well dished and broad; snout short and broad, but not pug-nosed	7
<i>Eyes:</i> Prominent, clear, large, hazel or gray	2
<i>Ears:</i> Medium, well apart, fairly erect	3
<i>Jowl:</i> Full, firm, not flabby or too low	3
<i>Neck:</i> Full, short, slightly arched, broad top well connected	3
<i>Hair:</i> Fine, straight, smooth, close lying, well covering...	3
<i>Skin:</i> Smooth and mellow	3
<i>Chest:</i> Deep, full wide with good heart girth	6
<i>Shoulder:</i> Smooth, even on top in line with sides	6
<i>Back:</i> Broad, full, strong, level or slightly arched, ribs well sprung	10
<i>Flank:</i> Extending well back and down on leg	5
<i>Loin:</i> Full wide and well covered with flesh	5
<i>Ham:</i> Deep, wide, thick, firm, extending well up on back and thickness down to hock	10
<i>Tail:</i> Well up on line with back, tapering, not too fine or short	2
<i>Legs and Feet:</i> Straight and strong, wide apart, short pasterns	10
<i>Size:</i> All possible without loss of quality	6
<i>Appearance and Character:</i> Vigorous, attractive, good disposition, firm and easy movement	6
Total	100

CHAPTER VI

THE SPOTTED POLAND-CHINA BREED

THE Spotted Poland-China hog is of strictly American origin, being the Big Spotted-China of the early Poland-China foundation bred up to the present "true to type and color" of his original ancestry. The early history of the Spotted Poland-China is identical with that of Poland-China, until along in the 1840's and 50's, when the different breeders of the Miami Valley in Ohio began to designate their hogs by various names, such as the Magie Hog, the Warren County Hog, the Miami Valley Hog, the Big Spotted Hog, Spotted China, etc.

While the greater number of all these breeds closely resembled each other and there was united effort to effect uniformity of type and breed, yet there were a few breeders who clung to old ideals, despite the uniform standard of color, type and breed which was effected shortly after the infusion of the Improved Berkshire, which gave to the present Poland-Chinas their solid black color with six cardinal white points.

The great majority of breeders accepted and practiced along these lines, which eventually builded one of America's greatest hog breeds. The minority clung to personal ideals, some producing the "Big White China" type, which eventually blended into prominent white breeds of the present day or were eventually lost in oblivion. Quite a number held faithful to the "Big

Spotted" type. D. M. Magie of Ohio and, latterly, A. C. Moore of Canton, Ill., produced "Big Spotted Chinas" for many years after the Poland-Chinas were standardized, as did many other breeders of lesser note, all of whom were the factors in holding well the type and purity of this breed until the present day.

These influences, despite the many generations of studied breeding to intensify and fix the color markings, are prone to breed back, often to one or more pigs of a very spotted color.

The Spotted Poland-China is the result of crossing the existing Big Spotted Poland-Chinas with carefully selected Poland-Chinas having a marked tendency to be spotted of color; this finally evolved and fixed a standard of spotted color markings and breed. The Spotted Poland-Chinas are of the big, mellow, general utility, lard type, maturing fully at from six to eight hundred pounds of weight, or for market at most any desired weight, with a low cost and amount of feed. They are prolific, good mothers, and raise thrifty, even and healthy litters of pigs.

The American Spotted Poland-China Record Association and the National Spotted Poland Association, both of Indiana, are the recording associations of this breed.

The following Standard of Perfection adopted by the Spotted Poland-China Record Association is given in detail to enable the breeder to define fully all qualifications:

STANDARD OF PERFECTION OR DETAILED DESCRIPTION OF SPOTTED POLAND-CHINA SWINE

I. *Head and Face* — Head medium, long and wide; jaws broad and strong; face smooth and broad between the eyes, slightly dished; nose medium long, surface smooth and even. *Objections* — Head narrow and coarse, jaws narrow and weak, face narrow between the eyes, straight or too much dish, nose coarse, too long or too short.

2. *Eyes* — Bright and prominent. *Objections* — Dull and obscure.

3. *Ears* — Large and drooping, well proportioned, attached neatly to the head. *Objections* — Small and thin.

4. *Neck* — Thick and very deep. *Objections* — Shallow and thin.

5. *Jowl* — Large, smooth and neat, carrying fullness back to shoulders. *Objections* — Small and flabby, not carrying fullness to shoulder.

6. *Shoulders* — Broad, deep and full, thickness extending well down. *Objections* — Thin and shallow, thickness not extending well down; boars too heavily shielded.

7. *Chest* — Large and deep, extending well down between the legs. *Objections* — Small and shallow.

8. *Back and Loin* — Back slightly arched, good breadth carrying even width from shoulder to ham, surface even and smooth. *Objections* — Narrow, creased behind the shoulders, swayed or humped.

9. *Sides and Ribs* — Sides very deep and carrying out fullness to line of belly. Ribs, long and well sprung in proportion to width of shoulders and hams. *Objections* — Sides small and creased, not carrying proper width from top to bottom.

10. *Belly and Flank* — Belly, good width, straight and full. Flank, well down to lower line of sides. *Objections* — Belly narrow, tucked up or flabby. Flank tucked up or drawn in.

11. *Ham and Rump* — Ham broad, deep and full, thickness extending well down to the hock. Rump should be slightly rounding, well filled out to the root of the tail. *Objections* — Ham small, thin and shallow, thickness not extending well down to the hock. Rump narrow, steep or peaked at root of tail.

12. *Legs and Feet* — Legs with large bone, of medium length, firm and well muscled, set well apart. Feet strong, standing up well on pasterns, free from defects. *Objections* — Legs small bone, too long or too short, crooked or set too close together. Feet, too long in the pastern, weak toes, crooked or turned up.

13. *Tail* — Long, well proportioned at the base, tapering to the end. *Objections* — Small, or too short.

14. *Coat* — A good coat of hair evenly distributed over the body. *Objections* — Hair too thin, swirls or not evenly distributed over the body.

15. *Color* — Perfect color, 40 per cent white, 60 per cent black. Must be 20 per cent white and not more than 60 per cent white, with well defined spots equally distributed over the body. *Objections* — Black and white intermingling.

16. *Size* — In good condition: Boars 2 years old and over, 600 pounds. Sows same age and condition, 500. Boars 18 months old, 500 pounds; sows, 400 pounds. Boars 12 months

old, 350 pounds; sows 300 pounds. Boars and sows 6 months old, not less than 200 pounds each. *Objections*—Overgrown, undersized, or hard to fatten.

17. *Action and Style*—Action, quick and vigorous. Style, free and easy. *Objections*—Dull and stupid, awkward, wabbling walk, testicles not easily seen nor of the same size.

18. *Condition*—Healthy, skin clear, free from scurf and sores, and flesh evenly distributed all over the body and free from lumps. *Objections*—Unhealthy, skin scaly, scabby or harsh; too fat or poor feeder.

19. *Disposition*—Very quiet and gentle. *Objections*—Wild and vicious.

CHAPTER VII

THE DUROC-JERSEY BREED

THE Duroc-Jersey hog is of American origin, but the antecedents are very difficult to trace, as many of the early explorers and colonists brought red hogs along with them. Columbus and other early Spanish explorers carried pigs on their ships for fresh meat, and some hogs were imported for breeding purposes in the early established colonies.

Great Britain had distinct breeds of red hogs for many centuries previous and made early exportations to its colonies. Their progeny eventually became known as Red Hogs, Jersey Reds and Guinea Reds in accordance with color, localities and place of supposed origin.

Constructive breeders began improvements upon the breed in the early 1800's by selecting and breeding the best individuals. Certain localities soon became known as producing a distinctive type of red hog,—the Red Berkshire in Connecticut, the Red Rocks in Vermont and the Jersey Reds in New Jersey and New York, during the period of 1820-30.

To further improve this breed, Daniel Webster imported a number of red hogs from Portugal, which eventually became crossed with the red hogs of Massachusetts, Vermont and New York. Henry Clay imported red hogs from Spain in the year 1837. They and their progeny were crossed with the herds of Virginia and Kentucky.

The progeny of all these many different red hogs in time became well distributed and fused together, eventually establishing a distinctive Red Breed, but, like the Poland-China of that period, with many designating names. As the breed grew in popularity it brought the breeders closer together in both understanding and effort, which resulted in really but two breeds shortly after the Civil War, the Jersey Reds and the Durocs, the latter named by a prominent breeder at Saratoga, New York, in honor of his famous stallion. The large Jersey Reds were described as being very large and growthy, long bodied, having large, flopping ears, long legs, long nose, and being rangy and of slow maturity. Their hair was coarse and inclined to stand erect or bristly on top and a few were sandy or spotted white in color. The Durocs were of medium size, medium short straight legs, with medium sized head and ears, having a fairly wide back with well developed shoulders and hams, in fact a very compact hog for that period and of fairly early maturity. Their color was generally cherry red.

The hog produced by the crossing and inter-breeding of the Duroc, the large and small Jersey Red and of the Red Berkshires and Red Rocks by the breeders of these regions eventually became known as the Duroc-Jersey after a convention held for the purpose of organizing the Red Hog Breeders in 1877. Since that time the advancement of type and the breed's popularity has been very rapid.

The Duroc-Jersey is now widely distributed and extremely popular all over the Corn Belt and universally recognized as a hog of high utility, prolificacy and easy keeping qualities. The Duroc-Jerseys belong distinctively to the lard type, being second in numbers to the Poland-China and in conformation they do not differ materially from them. They are very vigorous and of active dis-

position, prolific and good mothers, good feeders and grazers.

The American Duroc-Jersey Swine Breeders' Association was formed at Chicago in 1883. This was the first official recognition of the name Duroc-Jersey. The National Duroc-Jersey Association of Peoria, Ill., was organized in the year 1891. The American Duroc-Jersey Swine Breeders' Association records at Thorntown, Ind.

DUROC-JERSEY SCORE CARD

	Counts
<i>Head and Face:</i> Head, small in proportion, wide between eyes, nicely dished, tapering down to nose, smooth and even	4
<i>Eyes:</i> Lively, bright and prominent	2
<i>Ears:</i> Medium, drooped, attached to head neatly	2
<i>Neck:</i> Short, thin and deep, slightly arched	2
<i>Jowl:</i> Broad, full and deep, carrying fullness back	2
<i>Shoulders:</i> Moderately broad, deep and full, carrying thickness well down	6
<i>Chest:</i> Large, deep, full breastbone prominent	12
<i>Back and Loin:</i> Medium and even breadth, slightly arched, surface smooth	14
<i>Sides and Ribs:</i> Deep, medium length, full and even with side and belly line ribs long, strong and well sprung....	9
<i>Belly and Flank:</i> Straight and full and out in line	4
<i>Ham and Rump:</i> Broad, full and well let down to hock; rump of round, slope from loin to root of tail	10
<i>Legs and Feet:</i> Medium size and length, straight, nicely tapered, set well apart and well under body; pasterns and feet short and strong	9
<i>Tail:</i> Medium, large at base, tapering to brush at end	1
<i>Coat:</i> Straight, smooth, moderately thick and fine and well covering	3
<i>Color:</i> Cherry red without other admixtures	2
<i>Size:</i> Large for age and condition not too coarse and rough	8
<i>Action and Style:</i> Vigorous, free and easy	3
<i>Condition:</i> Healthy, free from skin ailments, lumps or creases, flesh evenly layed	2
<i>Disposition:</i> Very quiet and easily handled	2
<i>Symmetry of all points</i>	3
Total	100

DISQUALIFICATIONS

Upright ears, cramped chest, deep creases in back or back of shoulders, deformed legs or broken down feet, extreme small size scoring less than 50 points, not eligible to record.

CHAPTER VIII

THE CHESTER WHITE BREED

THE Chester White is a breed of American origin, accredited to Chester and Delaware Counties, Pennsylvania, during the early 1800's. The first importation of pure-bred white hogs was from Newcastle, England, to Delaware, in the year 1813. These were known as Cheshires, being described as "large and lengthy, long and bony legs, large head, long hanging ears, much curved back, deep flat sides, with pure white color."

The Cheshire was crossed upon herds of white hogs which were reputed to have their origin in the hogs brought to America by the colonists of William Penn. These hogs attained great weight; one account refers to a hog weighing 1410 pounds, and another 1300 pounds live weight.

Captain James Jeffries also imported a pair of white boars from England in the year 1818. They were pure white in color and were known as Cumberlands or Bedfordshires. Because they were of a better form, hardier, more prolific and easy to fatten, the cross breeding with them greatly improved the white hog of this period and stimulated an increased interest in the white breed. The best individuals of these crosses were retained and used as breeders, which, coupled with importations of White China Pigs from England, eventually resulted in the production of an almost ideal type of white hog, after many years of crossing and re-crossing the best specimens.

The name, Chester White, is attributed to the popularity

of the breed in the County of Chester, Pa. They made early-day winnings at the various eastern county and state fairs, during the 1840's. Although the Chester White is one of the first named American breeds of swine, its improvement must be accredited to the constructive breeders who made the improvement within the breed itself.

All breeds of swine have had more or less factional troubles and unscrupulous breeders to deal with in their history, and it is possible that no breed has had a more chaotic course than the Chester Whites, beginning from about 1848, when Bennie Hickman, Chalky Harvey and a few other loyal supporters, in Chester and Delaware Counties, Pa., created the breed in its purity with excellent feeding qualities, resulting in a demand greater than the supply of pure bred Chester Whites. This situation created a desire in unscrupulous dealers to sell thousands of hogs regardless of purity just so that they were white, as pure bred Chester Whites. The result of such a wholesale distribution of mongrels for several years following menaced the national popularity of the breed and brought consequent disaster and loss of prestige to the best efforts of the most constructive breeders of the pure bred. However, they prevailed, survived and eventually created a second period of prosperity, which was backed by the organization of the first Chester White record in 1884 by breeders who had retained their pure bred through the first period of depression. Once again the white hog was commercialized by certain breeders who claimed to have made an improvement of the breed. Their common practice was to cross the pure bred on a hog that was largely made up of the black breeds. Consequently the pure bred spotless Chester White was once more polluted with blood that produced black spotted pigs, thus setting up atavisms that frequently cropped out many years later. Although some degree of improve-

ment was made, as to individuality, by the efforts of these breeders, the infusion of the black spots resulted in another setback to the breed characteristics, largely in that it failed at times to breed true to color. While these black spots do yet occasionally appear, and disqualify the animal to record, the blue specks that sometimes appear in the skin do not fix breed impurity.

Following the organization of the first record association, other records were created from time to time until there were seven associations catering to the breed as late as 1913. During the later period of factional disturbances with record discriminations, the popularity of the breed was maintained only by the merits of the breed's pure bred supporters.

Final reformation came to the breed through the efforts of F. F. Moore & Sons, when they launched the breed paper, *The White Breeders' Companion*, in 1910, which was followed by the consolidation of the Chester White associations.

In general conformation the Chester White is much like the Poland-China, with which breed and its crosses they have made an enviable record at The International Barrow Shows and the dressed carcass contests. The popular endeavor of the Chester White breeders is to breed a larger type hog and they have succeeded well in producing excellent specimens of the large, smooth type. The individuality of the Chester White has been greatly improved during the last five years and much attention has been given to breeding a heavier coat of hair to withstand the different climatic conditions.

The Chester White is one of the big four, lard type breeds, and is an excellent breeder and feeder. It is very prolific and saves a large percentage of its litters. It matures rapidly and at almost any desired period. It

is vigorous and possesses adaptability to prevailing food-stuffs and is a good ranger.

The record associations for the breed are The Chester White Swine Record Association, of Rochester, Ind., and the O. I. C. Swine Breeders' Association, of Goshen, Ind.

CHESTER WHITE SCORE CARD

	Counts
<i>Head:</i> Short, broad between eyes, tapering to nose, face slightly dished	4
<i>Eyes:</i> Bright, large, free wrinkles or fat	2
<i>Ears:</i> Drooping, thin, well-proportioned	2
<i>Jowl:</i> Full, firm, neat, carry fullness well back	2
<i>Neck:</i> Full, short, deep and well arched	2
<i>Shoulders:</i> Broad, deep, thick in proportion to side and ham; full even at top	6
<i>Chest:</i> Brisket full, strong, well let down and in line with belly, good heart girth, full back of shoulders	12
<i>Back and Loin:</i> Broad, strong or arched and of medium length; loin broad, full and strong	14
<i>Sides and Ribs:</i> Full and deep, ribs well sprung	9
<i>Belly and Flank:</i> Wide, straight, well let down and full...	4
<i>Ham and Rump:</i> Broad, full, deep, of medium length, coming down well to hock, rump not too steep	10
<i>Feet and Legs:</i> Medium length, set well apart and under firm bone, not coarse, short pasterns and foot	9
<i>Tail:</i> Small, smooth, tapering and well set on	1
<i>Coat:</i> Fine and thick, not coarse or wiry	3
<i>Color:</i> White (blue spots or black specks do not denote impurity)	2
<i>Size:</i> In proportion to age, neither too small nor too large	8
<i>Action and Style:</i> Vigorous, easy and graceful	3
<i>Condition:</i> Healthy and mellow	2
<i>Disposition:</i> Quiet and gentle. All points of the animal should be of uniform build and proper proportion to be symmetrical	2
<i>Symmetry</i>	3
Total	100

CHAPTER IX

THE HAMPSHIRE BREED

THE Hampshire breed is of English origin but developed as a distinct breed in America. In England the old English and English Thin Rind and also Essex are credited with being the forebears of the breed. Individuals of the breed were imported to Canada and to America in the early 1800's, the first direct importation being made by Capt. McKay to Boston in 1820. These were known as Thin Rinds and their progeny became well distributed over the eastern part of the Corn and Hog Belt by 1835 to 1850.

In only a few localities did the breed retain purity, as it was used largely to blend with many of the other breeds then forming. Kentucky was one of the states that favored them in pureness, Major Garnett being their greatest promoter in that state. Unfortunately, the breed deteriorated greatly during the 50's, 60's and 70's, until but a few herds of pure bred were left. The worth and demand for these finally effected the organization in 1893 of the American Hampshire Swine Record Association in Boone County, Kentucky. Since that time the Hampshire breed has increased greatly in popularity.

The Hampshire, while generally credited as a bacon hog, serves well as a dual or combination bacon and lard hog. It is hardy, prolific and a good grazer, especially in wooded districts, and is of early maturity, producing a

high yield of excellent products. Hampshires generally mature at about 400 or 500 pounds, with breeding individuals exceeding this weight by one to three hundred pounds.

The distinguishing characteristic of this breed is its color marking, which is black, excepting a white belt, eight, ten or twelve inches wide, extending entirely around the body over the shoulders with the fore legs included. This caused them to be also called the "Belted Hogs" by many early-day hog men. The breed bids fair to advance greatly in favor with the hog producers generally.

The American Hampshire (Thin Rind) Swine Record Association at Peoria, Ill., is the only record association.

HAMPSHIRE SCORE CARD

	Counts
<i>Head and Face:</i> Medium length, rather narrow, face nearly straight, medium between eyes, medium check, even surface	4
<i>Eyes:</i> Bright and lively, free from wrinkles or fat.....	2
<i>Ears:</i> Medium, thin, inclined slightly outward and forward, not drooping	2
<i>Neck:</i> Short, well set, tapering from shoulder	2
<i>Jowl:</i> Light and tapering, neat and firm	2
<i>Shoulders:</i> Deep, medium wide, well in line	6
<i>Chest:</i> Large, deep and roomy, full heart girth	12
<i>Back and Loin:</i> Back medium breadth, uniform thickness, full at loins, straight or slightly arched	15
<i>Sides and Ribs:</i> Smooth, firm, carrying size evenly; ribs strong and well sprung	8
<i>Belly and Flank:</i> Straight and full, devoid of grossness...	6
<i>Hams and Rump:</i> Hams medium width, long and deep rump slightly rounded, buttocks full, devoid of flabbiness or excess fat	10
<i>Feet and Legs:</i> Medium length, set well apart, squarely under body, wide above knee and hock rounded, well muscled and tapering below bones, medium pasterns, short; toes, short and firm	10
<i>Tail:</i> Medium length, slightly curled	1
<i>Coat:</i> Fine, straight, smooth	2

<i>Color:</i> Black with exception of white belt encircling body, including fore legs	2
<i>Size:</i> Large for condition	5
<i>Action and Style:</i> Active, vigorous, graceful, attractive and spirited	4
<i>Condition:</i> Healthy flesh evenly laid, smooth and firm, devoid of grossness, skin free from all defects	4
<i>Disposition:</i> Docile, quiet and easily handled	3
Total	100

DISQUALIFICATIONS

Spotted or more than two-thirds white and radical deformity; ears too large or drooping over eyes; crooked, weak legs or broken down feet; diseased or seriously impaired or excessive grossness; not two-thirds standard size, barren or ineligible to record.

CHAPTER X

THE YORKSHIRE BREED

THE Yorkshire swine are divided into three distinct breeds,—the Large, the Middle and the Small.

The Large or Big Type Yorkshire is a true exponent of the bacon type, while the Small Yorkshire is a hog of extreme early maturity and high finish, compact of form and maturing at a little over 200 pounds, making it a small lard type.

The Middle Size Yorkshire is the result of the cross of these two types or breeds and is only produced to any extent in England. The Large Improved Yorkshire may be considered largely of English origin, their forebears being the old English hog upon which Chinese hogs were crossed, followed by selection and breeding until a distinct breed was effected, being described at that time as a very large, rough, coarse animal, prolific, hardy and active, but of a slow maturity. To effect quicker maturity certain breeders crossed them with the nearby, smaller, higher finished, white breeds of hogs. The White Leicester and perhaps the Small Yorkshire resulted from the selection, breeding and inbreeding of these crosses.

Robert Bakewell, the great English sheep and hog breeder, developed a type very similar to the present large Yorkshire, and Joseph Tuley, Mr. Wayman and Mr. Spencer, all in the county of Yorkshire, England, further improved and perhaps fixed the type and breed dur-

ing the early 1850's and '60's. The first importation of large Yorkshires is accredited to A. B. Allen of Ohio in 1840, followed by many later ones from both England and Canada, but the real foundation breeding stock was imported from England to Minnesota in 1893.

The leading characteristics of the breed are their large size, pure whiteness in color, long bodies, long, large boned legs and general high bacon producing conformation. The large Yorkshires make very prolific, good mothers, good grazers and profitable market hogs. They can be marketed at any period after six months of age, but on account of color are more popular in the northern part of the Hog and Corn Belt. Their size and form indicates a rather slow maturity to adult size, but this is offset largely by their other good qualifications, which with their hardiness and poundage of pork to the producing unit, make them of high merit.

The Small Yorkshire was first noted in England during the early 1800's. It is there called the Small White. Whether it originated from the old Yorkshire or from some other source is not definitely known; anyhow, the White Leicester, Cumberlands and Chinese were crossed and recrossed with selection and breeding which finally established a small typed, highly finished, early maturing white hog. The first importations to America occurred in the early 1860's and '70's to New Jersey and New York.

The Improved Small Yorkshire Club, of Espyville, Pa., and the American Yorkshire Club, Whitebear Lake, Minnesota, are the breed associations; the latter also records Small Yorkshires.

YORKSHIRE SCORE CARD

	Counts
<i>General Outline:</i> Long and deep, proportionately wide, slightly arched back, symmetrically smooth body, firmly supported by well placed legs	5

<i>Head Outline:</i> Moderate length and size, lower jaw well sprung with some dish towards snout	4
<i>Forehead and Poll:</i> Wide	1
<i>Eye:</i> Medium, clear and bright	1
<i>Jowl:</i> Medium, clean, not flabby	1
<i>Snout:</i> Turning upward, slight curve, increasing with age	1
<i>Ear:</i> Medium, standing out well, inclining slightly forward, nearly erect	1
<i>Neck:</i> Medium, fair width and depth, evenly connected...	3
<i>Body Outline:</i> Long, deep, medium and equal breadth, top line slightly arched, under line straight	7
<i>Back:</i> Moderately broad, even in width, strong loins, short ribs of good length	10
<i>Shoulder:</i> Large, not massive or open above	6
<i>Arm and Thigh:</i> Broad, medium length and development..	2
<i>Brisket:</i> Wide and level with under line	3
<i>Sides:</i> Long, deep, straight and even from shoulder to hip	8
<i>Ribs:</i> Deep and well arched	5
<i>Heart and Flank:</i> Girth good and about equal	8
<i>Hind Quarters:</i> Long and deep corresponding with shoulder and sides, drooping gradually to tail	5
<i>Hams:</i> Large, well let down, rear outline somewhat rounded	10
<i>Twist:</i> Well down and medium	1
<i>Tail:</i> Medium not inclined to curve much	1
<i>Legs:</i> Medium and strong, standing straight and firm. Not too coarse	5
<i>Hair:</i> Abundant, long, medium fine without bristles	4
<i>Skin:</i> Smooth, white without scales. A few dark spots do not disqualify	2
<i>Color:</i> White in every part	1
<i>Movement:</i> Active, not restless	5
Total	<hr/> 100

CHAPTER XI

THE TAMWORTH BREED

THE Tamworths are commonly accredited to be of English origin, taking their name from the town of Tamworth in South Staffordshire, which in the 1700's was the center of the breed's popularity. The Tamworths are also alleged to be of Irish origin. However, they were imported to Canada in the early 1800's and to the United States during the later 1800's. The Tamworths were popular in the early 1800 show-rings of England, but America seemingly did not recognize the breed until after the first direct importations made by Thos. Bennett of Illinois in 1882. Since that time, many importations also have been made from Canada.

The Tamworths have been remarkably free from outside infusion, being in fact one of America's purest breeds, their improvement being solely by selection and studied breeding within their own breed. The Tamworths are true exponents of the bacon type and produce an excellent bacon, having fancy streaks of fats and leans which bring a good premium, especially abroad.

In size the Tamworth exceeds even the large Yorkshire, sometimes attaining 1300 to 1400 lbs. at 3 years of age. They are hardy, good grazers, very prolific and good mothers, raising a large per cent of their litters. Their disposition is of a domestic nature when gently handled. They require a little longer to reach full maturity, but arrive at great weights and for the amount of

food consumed, fatten as cheaply and as well as any breed of swine. They make a good feed lot hog, especially where active hogs are desired. The Tamworth is a bacon breed that should become more popular in America.

The only record is the American Tamworth Swine Record Association at Hamburg, Mich., organized in 1897.

STANDARD FOR TAMWORTHS AS ADOPTED BY THE NATIONAL
PIG BREEDERS' ASSOCIATION OF GREAT BRITAIN

Color: Golden red hair on a flesh colored skin, free from black.

Head: Fairly long, snout moderately long and quite straight, face slightly dished, wide between ears.

Ears: Rather large, with fine fringe, carried rigid and inclined slightly forward.

Neck: Fairly long and muscular, especially in boar.

Chest: Wide and deep.

Shoulders: Fine, slanting and well set.

Legs: Strong and shapely, with plenty of bone, and set well outside body.

Pasterns: Strong and sloping.

Feet: Strong and of fair size.

Back: Long and straight.

Loin: Strong and broad.

Tail: Set on high and well tasselled.

Sides: Long and deep.

Ribs: Well sprung and extending well up to flank.

Belly: Deep, with straight under line.

Flank: Full and well let down.

Quarters: Long, wide and straight from hip to tail.

Hams: Broad and full, well let down to hocks.

Coat: Abundant, long, straight and fine.

Action: Firm and free.

Objections: Black hair, very light or ginger hair, curly coat, coarse mane, black spots on skin, slouch or drooping ears, short or turned up snout, heavy shoulders, wrinkled skin, inbent knees, hollowness at back of shoulders.

CHAPTER XII

THE CHESHIRE BREED

THE Cheshire hog is of American origin. The first definite record of this breed is in Jefferson County, N. Y., in about 1855.

The breed's forebears are a large imported Yorkshire boar, crossed on the prevailing white hog of that locality and later with white Suffolks and Cavanaugh hogs. With careful selection and inbreeding practices there was produced a distinct type of high individual merit during the late 60's and the early 70's. These were first known as the Jefferson County hogs.

The breed waned in popularity during the later 70's, to be revived again by the organization of the Cheshire Swine Breeders' Association. Mr. A. C. Clark is credited with being the most prominent originator, and Mr. E. W. Davis with being largely instrumental in reviving the breed later.

The name Cheshire was officially adopted at the Swine Breeders' Convention in 1872 at Indianapolis. The name is of English origin, but there is no record of the breed's ancestors being the English Cheshire hog.

The Cheshire is a neat, compact, medium-sized, highly finished lard hog, prolific, easily fattened and is a high dresser of choice products.

The Cheshire Swine Breeders' Association, Freeville, N. Y., is the recording association.

CHESHIRE SCORE CARD

	Counts
<i>Head:</i> Short to medium in length, short in proportion to length of body	8
<i>Face:</i> Somewhat dished and wide between the eyes	8
<i>Jowl:</i> Medium in fullness	3
<i>Ears:</i> Small, fine, erect and in old animals slightly pointing forward	5
<i>Neck:</i> Short and broad	3
<i>Shoulders:</i> Broad, full and deep	6
<i>Girth around heart:</i>	8
<i>Back:</i> Long, broad and straight nearly to root of tail.....	10
<i>Side:</i> Deep and full, nearly straight on bottom line	7
<i>Flank:</i> Well back and low down, making flank girth nearly equal to heart girth	3
<i>Hams:</i> Broad and nearly straight with back, and running down well towards hock	10
<i>Legs:</i> Small and slim, set well apart, supporting body well on toes	10
<i>Tail:</i> Small, slim and tapering	3
<i>Hair:</i> Fine, medium in thickness and quantity	3
<i>Color:</i> White, any colored hairs to disqualify	2
<i>Skin:</i> Fine and pliable, small blue spots objectionable, but allowable	3
<i>Symmetry:</i> Animal well proportioned, handsome and stylish	8
Total	100

CHAPTER XIII

THE IMPROVED ESSEX BREED

THE Essex is of English origin, being from the crossing of the old Essexshire hogs of Essex County and the Neapolitan.

The old Essexshire was a large, rangy, almost black colored, long-legged, short-snouted, flat-sided, wild-like hog of long and hard maturity. The Neapolitan cross was made in about 1830, which improved the conformation and reduced the size of the animal, shortened the legs, quickened the maturity and made the color almost black. Perhaps the Berkshire and Suffolk were also used during this period.

Close inbreeding practices during the next few years weakened the breed materially, until about 1840, when Fisher Hobbes, a constructive breeder, crossed back to the primitive Essex stock, and in a few years restored much of the breed's high qualifications.

The first importations into America were to Massachusetts in 1821, of hogs resembling the old Essex type. The improved Essex came during the early 50's. The breed has not gained much popularity in the United States except in the South, where it seems to be better adapted to the conditions and demands than in the northern states.

The Essex is a compact, highly finished lard type of hog, having the most extreme rapid maturity. It usually matures at about 300 lbs., rarely above 400 lbs.

The American Essex Association of Annawan, Illinois, organized in 1887, is the only record association.

ESSEX SCORE CARD

	Counts
<i>Color:</i> Black	2
<i>Head:</i> Small, broad and dished face	3
<i>Ears:</i> Fine, erect	2
<i>Jowl:</i> Full and neat	1
<i>Neck:</i> Short, full and well arched	3
<i>Shoulders:</i> Broad and deep	7
<i>Girth around heart:</i>	6
<i>Back:</i> Straight, broad and level	12
<i>Sides:</i> Deep and full	6
<i>Ribs:</i> Well sprung	7
<i>Loin:</i> Broad and strong	12
<i>Flank:</i> Well let down	2
<i>Hams:</i> Broad, deep and full	12
<i>Tail:</i> Medium, fine and curled	2
<i>Legs:</i> Fine, straight and tapering	3
<i>Feet:</i> Small	3
<i>Hair:</i> Fine, silky, and free from bristles	3
<i>Action:</i> Easy and graceful	4
<i>Symmetry:</i> Adaptation of parts to each other	10
Total	100

CHAPTER XIV

THE VICTORIA BREED

THE Victoria is a white, lard type hog of American origin. Mr. Geo. F. Davis of Indiana is credited with having crossed Poland-Chinas, Chester Whites, Berkshires and Suffolks and by selection and breeding established a fixed type that eventually became known as the Victoria, about 1870, the name being taken from a noted sow, "Queen Victoria." There was a Victoria breed in New York prior to and for many years after the Indiana breed was originated. They were of a smaller, compact form, and have practically died out as a distinct breed.

The Victoria is of medium size and of fairly good lard type conformation. It is a good grazer, feeder, prolific and free from mange.

The Victoria Swine Breeders' Association of Dyer, Ind., is the recording association.

VICTORIA SCORE CARD

	Counts
<i>Color:</i> White, occasional black spots on skin	2
<i>Head:</i> Small, broad and face medium dished	3
<i>Ears:</i> Fine, pointing forward	2
<i>Jowl:</i> Neat and medium size	1
<i>Neck:</i> Short, full and well arched	3
<i>Shoulders:</i> Broad and deep	7
<i>Girth around heart:</i>	6
<i>Back:</i> Straight, broad and level	12
<i>Sides:</i> Deep and full	6
<i>Ribs:</i> Well sprung	7
<i>Loin:</i> Broad and strong	12

	Counts
<i>Flank:</i> Well let down	2
<i>Ham:</i> Broad, deep, full, without loose fat	12
<i>Tail:</i> Medium fine and curled	2
<i>Legs:</i> Fine and straight	3
<i>Feet:</i> Small	3
<i>Hair:</i> Fine, silky, and free from bristles	3
<i>Action:</i> Easy and graceful	4
<i>Symmetry:</i> Adaptability of several parts to each other....	10
	<hr/>
Total	100

CHAPTER XV

THE SUFFOLK BREED

THE Suffolk is a small type, white hog, very similar to the small Yorkshire, in fact many hog men regard it as the same.

The old English Suffolk was a large white hog, but through crosses with small type, black hogs, as the Neapolitan and Essex, it is now a small, black, easily maturing hog. The American Improved Suffolk has retained the old breed's color, and through careful selection and breeding has become a type that is an easy keeper, fitted more for close pen purposes than open farm purposes. They are not very prolific nor good mothers; however, they mature early and readily.

The first importation is credited to Illinois in about 1855, but there is some question as to whether these hogs were Suffolks or Small Yorkshires. The breed at present is thinly distributed over the eastern part of the Hog Belt.

The description of the Suffolk is a rather small, yellowish-white colored hog, thin skinned, with a small short head, dished face, short snouted, well developed jowl and short upright ears, the body conformation being of medium good length, heavy shoulders, broad back, wide and deep chest, full, wide and rounded hams, with the belly line close to the ground. The feet and legs are very short and set wide apart.

SUFFOLK SCORE CARD

	Counts
<i>Color:</i> White	2
<i>Head:</i> Small, broad, and face dished	3
<i>Ears:</i> Fine, erect, slightly drooping with age	2
<i>Jowl:</i> Full and neat	1
<i>Neck:</i> Short, full, and slightly arched	3
<i>Shoulders:</i> Broad and deep	7
<i>Girth around heart:</i>	6
<i>Back:</i> Straight, broad, level	12
<i>Sides:</i> Deep and full	6
<i>Ribs:</i> Well sprung	7
<i>Loin:</i> Broad and strong	12
<i>Flank:</i> Well let down	2
<i>Ham:</i> Broad, full, deep	12
<i>Tail:</i> Medium, fine, and curled	2
<i>Legs:</i> Fine, straight, and tapering	3
<i>Feet:</i> Small	3
<i>Hair:</i> Fine and silky, free from bristles	3
<i>Action:</i> Easy and graceful	4
<i>Symmetry:</i> Adaptation of the several parts to each other..	10
Total	100

CHAPTER XVI

THE MULE-FOOT BREED

THE origin of the Mule-Foots, no doubt, traces back to Biblical times, as the writers of that period mention solid hoofed hogs. Breeds of these swine inhabited Southern Europe and Northern Africa, along with the split hoof herds of swine that were of Northern Europe and Asiatic origin. The solid hoof hogs eventually became thinly distributed to more distant lands and were bred by Swedish and English breeders during the 1700's. They were supposed to have been imported to America by Swedish emigrants or by slave ships from Northern Africa, during the early 1800's, and in time became slowly distributed over the eastern part of the Hog and Corn Belt.

Geo. W. De Hart of Indiana was the first breeder and was the organizer of the National Record Association. Nearly all Mule-Foot pedigrees trace back to his breeding. He was the breed's most constructive breeder and promoter.

The breed has not materially changed in type or had any other infusions in America; hence, it can not be considered of American origin, but more as foreign pure-bred, improved by selection and breeding.

The Mule-Foot has in late years been wrongly advertised as cholera-immune. This injured the breed's popularity, but the breed's real worth has overcome this setback and bids fair to claim a distinct place in the future of pork production.

The National Mule-Foot Hog Record Association of De Graff, Ohio, is the record association.

MULE-FOOT SCORE CARD

	Counts
<i>Head and Face:</i> Medium length, broad between eyes, evenness	4
<i>Eyes:</i> Bright and lively, free wrinkles or fat	2
<i>Ears:</i> Medium thin tipped, drooping and well set	2
<i>Neck:</i> Short, well set on shoulders, tapering shoulder to head	2
<i>Jowl:</i> Full, neat, and firm, tapering neck to point.....	2
<i>Shoulders:</i> Broad, oval at top, even and of good weight...	6
<i>Chest:</i> Large, wide, deep and full, especially behind shoulders	12
<i>Back and Loin:</i> Good breadth, straight or slightly arched, even, smooth and of uniform thickness	15
<i>Sides and Ribs:</i> Very deep, full and level with shoulders and ham extending down to belly line. Ribs well sprung	8
<i>Belly and Flank:</i> Straight and full, carrying lines out well to connecting parts	6
<i>Ham and Rump:</i> Broad, full, extending well down to hock, having a round slope from loin to root of tail	10
<i>Feet and Legs:</i> Medium size, straight tapered, well apart and set well under body. Short feet and pasterns. Solid hoofs	10
<i>Tail:</i> Medium length, tapering from base	1
<i>Coat:</i> Moderately thick, good covering hair fairly fine...	2
<i>Color:</i> Black. A few white points is admissible.....	2
<i>Size:</i> Large for condition and age. 2 year old boars, 500 lbs. or over. 2 year old sows, 450 lbs. or over.....	5
<i>Action and Style:</i> Bright, active	4
<i>Condition:</i> Showing good health, clean skin, flesh smooth and even	4
<i>Disposition:</i> Reasonably gentle and quiet	3
Total	100

DISQUALIFICATIONS

Slit or broken down feet, or bad deformity, blind, barren or diseased condition. Not two-thirds standard weight. Swirls or excessively curly hair.

CHAPTER XVII

HOG BREEDING

THE hog, although of old country origin, has in America attained a greater development in general utility than in the mother countries. This may be attributed mostly to the ideal fattening of corn, the developing roughages and milks, and the almost ideal climatic conditions and environments. The history of every American originated or improved breed is but the record of continuous study and labor to develop a type and breed that can utilize most successfully these feeds and conditions. The Poland, Berkshire, Duroc-Jersey, Chester White, Spotted Poland, Hampshire to-day stand as the highest achievements of many master-mind breeders.

Practically every breed has run the gamut of extremes in size, finish and maturity, and hog breeders years ago learned that an excessive corn diet coupled with small size effected too early maturity, a lower prolificacy and ultimate pork production. Many breeders sought correction by mating extremes and as the natural tendency of all animal life, hogs especially, is to go to one extreme or the other, disastrous endings resulted, to be finally righted by the efforts of more conservative breeders. The real progress of breeds was mostly effected by these middle ground breeders. However, the extreme types cannot be dispensed with entirely as they are the governing factors, the positive and negative powers, used to keep or change the type near to ideal, and meet the general demands of breeders, feeders, packers and consumers.

Hogs are classified into four general types: Pure-breds, grades, cross-breds and scrubs. There are no breeds of hogs that can be called thoroughbreds.

The pure-breds are those which can trace their lineage back for many generations without break or infusions of outside blood, until the present individuals have established a fixed prepotency of type and breed.

The grades are individuals that are farrowed from the mating of individuals that are not both pure-breds, one being a pure-bred while the other may be a grade, cross-bred or scrub. When the tendency is to build up the blood and quality of the grades, pure-bred sires are used on selected grade sows. Their progeny are called high grades.

The cross-breds are those farrowed from the mating of pure-breds of different breeds; for instance the breeding of a pure-bred Poland-China boar to a pure-bred Duroc-Jersey sow. Such crosses generally produce litters having high pork producing and market requirement qualifications, but there is no other method that will cause a quicker and surer retrogression of breed and type than its continued practice. The first crosses are very desirable, the second sprinkled with bad individuals and the following ones bring disaster. This may be termed destructive breeding, for the ultimate end is scrubs, failure and final dispersion of the herd.

The scrubs are individuals that by causes of incorrect breeding, feeding and care, have become so prepotent in low vitality, thrift and growth that they represent and give cause for the reproduction of both self and their progeny in the lowest forms of conformation, general utility and profit.

The old adage that "like begets like" is a very good maxim to follow in the hog business. It is also well to remember that the upbuilding of types and breeds re-

quires much study and time. The true course is ever upward and onward, not by experiments or attempting creations of new breeds, but by using the present day types and breeds. They that attempt to do otherwise only wreck and tear down much of the advancement and improvement that the combined efforts of the successful hog men were generations in building to its present state of perfection.

The size, vigor, prolificacy and quality of breeding hogs must ever be kept fundamental. The creations of extremes or the indiscriminate change of type blood lines should be avoided. The better method is to gradually effect desired changes of type and blood lines to conform to ideal, by the mating of animals in the herd with outside individuals of similar conformations strongly developed, but not of too radical differences of blood lines and characteristics, as there sometimes exists just as much difference between different families of the same breed as there is between entirely different breeds.

Never mate individuals that are deficient or that need improvement in the particular important parts, as such practices tend to intensify these particular weaknesses in their progeny. Proper breeding, with limited inbreeding, will intensify and fix the type of the herd with individual characteristics of its own. This followed with the occasional infusion of outside blood that is of a lineage and conformation promising to strengthen and add to their high qualifications, coupled with good herd management, sanitary care and good feeding, will tend to establish a stronger prepotency, a herd of better individuals and of higher remunerative results.

The majority of breeders and producers recognize that all breeds have long ago passed the experimental stage, and that all corrections of type and breed must henceforth occur within that particular type and breed. Cor-

rections in the past were the work of "master-minds," not of novices, nor of those that attempted to copy, and any marked changes of type or breed in the future must be made by experienced, constructive, master breeders.

So the hog man that would be successful must accept of a certain type and breed that has stood the crucial test of time and practice, the survivors of "the survival of the fittest," and breed, feed and care for them in accordance with the best known laws of pork production.

CHAPTER XVIII

SELECTION OF TYPE AND BREEDING ANIMALS

THE proper selection of type has much to do in the ultimate success of pork production. The breed is not as essential as the type, which should be selected to conform to local environments, climatic conditions, food-stuffs and market demands. Necessity is the mother of invention, consequently the controlling and contributing causes, coupled with the demands of the consumers, have brought about and effected definite delineations of the leading types, viz: The lard type, the bacon type, the combination type, the breeder's type, the show yard type and the farmer's type.

Pork producers are in the business for the monetary returns derived therefrom. This sometimes actuates some of them to produce a type and breed entirely different from that of their ideal, and oftentimes to base their breeding operations upon low bred grades or cross-breds, which despite the fact that they are oftentimes profitable for the time being, will soon evolve into a type that is designated by its low state of vitality, weak constitutional vigor, slow and hard maturity, high cost of feeding and low quality of finished pork products. Such types and procedures account for many of the failures of hog raising and account for quite a large per cent of the prevalent hog ailments.

While it is true that many hog men have success al-

most indefinitely with low bred grades and cross-breds, the greater part of their success may be attributed to the fact that they are natural hog men, very conversant with all the problems of breeding, feeding and care of hogs. Should these men apply themselves to high bred grades and pure-breds, they would secure much greater results. Such men usually become pure-bred breeders of hogs, after experience shows them the possibilities open for them in that line.

In the selection of breeding animals of any type or breed, a careful study should be made of their ancestors, performance in prolificacy, maturity and power of pork production. Always select individuals that are or promise to be the highest exponents of these essentials. Special attention should be given to their constitutional appearance of growth, vigor and vitality. They should not be the culls, or the leftovers of choice, market or disease.

The male should always be better individually than the general average of the sow herd, being particularly strong, potent and vigorous, easy feeding and of quick maturity, conforming closely to type and breed, and of an ancestry popularly known for their performances in both breeding and feeding yards. The most essential points of his conformation are that he be of good size, with the back long proportionately, broad, full, even and slightly arched. The bone of good size, rounded and of good strength and texture. The body frame should be proportionately larger than that of the sows, with the legs straight and set well apart, having short and strong pasterns and standing well up on the toes. In style, the male should carry his body with free action, giving every evidence of his masculinity and promise of high power of constitutional vigor and vitality being transmitted to his progeny.

The selection of the brood sow is as important as that

of the sire, as she is the "seed-bed" of pork production. If the sow herd be of high producing qualifications, the pig crop in numbers and quality can be reasonably expected to be above the average; otherwise, the pig crop becomes of unknown quality and quantity, excepting that it be of lesser remunerative returns. The proper time to commence making the selection of brood sows should be at the time of their birth. Many practical hog men make note of each pig's characteristics as they come into the world, marking in mind the ones that are noticeably strong and vigorous, that find the teat almost immediately, suckling vigorously at it, and have quick filling up of body and rapid development during pignood. The best time to select and separate the future brood sows by themselves, is about the time or immediately after they are weaned.

The essential qualifications of ideal breeding gilts are: In size, fairly large for age and type, good length of body, the back without depressions and slightly arched, even and full, with the rib line even from shoulder to ham, and the loins fully developed. The rump and loins should be broad, showing more width of body at this point than in the shoulders. The frame and bone should be indicative of good size and strength combined. The gilt may be inclined to be rangy, but not extremely so, the medium long proving best, and considerable quality should accompany. The side and belly should be good depth, length and breadth, showing good capacity. The feet and legs should be straight and set well apart, showing a good capacity of chest and vital organs. The feet and hoofs short, and well rounded, short of pastern and standing well upon the toes.

The gilt should show free use and carriage of body, with plenty of action and style, but not too fanciful. The head and ears should be medium of size, not too short

or dished, being rather plain and long, and of good breadth between the eyes, tapering down to medium sized snout. The jowl should be clean cut, slightly rounded, but never excessive. The neck need not be full or wide, so that it is not depressed or out of line in joining the head and shoulders. Special attention should be given of the heart girth, width between the forelegs and between the eyes. These are good characteristics of strong constitutional vigor and vitality. Post-mortem examinations at the leading packing houses reveal that the greater per cent of cases of tuberculosis occurs in hogs that are narrow between the eyes and forelegs. The easy feeding and maturing qualifications must always be recognized. Too quick a maturity is almost as bad as a slow or hard maturity. All individuals that have a tendency to mature at a tender age should not be selected, nor should those that develop into extreme rangy, too coarse or wolfish appearance. Last, but not least, is the indicated size and number of teats of the udder. Brood sows should have at least ten teats, and twelve is plenty — more than this number is unnecessary, as the best of results are secured from sows farrowing and suckling seven to ten pigs. About twice as many gilts should be selected as are needed, for the final testing and breeding process will eliminate many promising ones.

The gilts thus selected should be placed in a good pasture lot, having free access to plenty of pure and clean water. Their sleeping quarters should be kept comfortable and sanitary and their feeding ration well balanced, mostly of shorts, slop, oats, a little corn, and milk. This with ideal range on alfalfa or clover makes a splendid combination, and will cause them to develop into big stretchy gilts within a few months, of high promise to reproduce plentifully.

These gilts may be bred in November and December

and if their litters prove to be as desired, they may be retained indefinitely as brood sows. However, gilts sometimes do not prove to be ideal brood sows until their second litters, so all gilts that are ideal of conformation should not be discarded even if they do fail to farrow many pigs the first time.

The breeding herd should be selected so that the main dependency be upon tried and aged brood sows, their places when discarded being taken only by proven gilts. By this practice the vitality, health and general thrift of the herd will be of a much higher degree, while the continued practice of breeding young and untried gilts only, and of marketing them after they have farrowed but one or two litters, is one of the surest causes for low states of vitality, thrift and type and of many prevailing fatal diseases and ailments so disastrous to both herd and hog men.

CHAPTER XIX

IN-BREEDING, LINE-BREEDING AND OUT-CROSSING

BROADLY defined, in-breeding is the mating of animals of a close degree of relationship. The term "in-breeding" usually means the mating of brother and sister, or that of a parent with the offspring, while "line-breeding" means the mating of animals not so closely related, but those of an unbroken line of relationship and ancestry coupled together with infusions, or mixed strains of families unrelated, or more plainly speaking, "in-breeding" means the mating of animals of a similarity of ancestry of about 50 per cent or more identical, while "line-breeding" may be defined as the mating of animals of approximately 25 per cent identical, as grandsire to granddaughter, uncles to nieces and second cousins. Line-breeding also means the annual succession of sires that trace back to a same family.

Out-crossing, broadly, means the breeding of animals of the same breed, but of different families. This practice is the cause of many failures, for oftentimes the prepotency, blood lines and conformation are so antagonistic to good breeding laws that they will not "nick" properly. Good results are obtained by some breeders who, before attempting the experiment, make an exhaustive study of the ancestry, prepotency and conformations as far back as available, and even then reach results often almost as bad as if they had crossed breeds, rather than families or types of breed.

The success of line-breeding lies largely in the general high quality and prepotency of the standard bearer and his chief lieutenants, for instance, that of Tom Corwin 2nd and his renowned sons, also Chief Tecumseh 2nd, Longfellow and their many prominent show and breeding boars. N. H. Gentry, through many studious years, has successfully controlled the system of in-breeding in his herd so that he has not been forced to purchase a boar outside to use in his herd for almost thirty years. However, this does not mean that in-breeding is advisable or practical for all hog breeders, for even in the hands of master breeders it has produced the most serious failures, sometimes destroying the general utility and often the thrift and health of the entire herd.

While no doubt in-breeding aids to promulgate and perpetuate many highly desirable qualities of certain prepotent individuals and families, the practice, generally speaking, is but the playing with fire in the hands of the novice or every-day hog man.

One of the basic principles of success in the practice of in-breeding or line-breeding is of never mating animals that have the same serious defects of conformation, but the mating of those that are strong in certain points of conformation wherein the other animal is weak, and of those that have in common the same high excellence of desirable points of conformation without any serious faults.

The mating of animals having similar strong and weak points has a tendency to intensify the same points of strength and weakness, hence in order to build up a family herd of swine of highly desired qualifications, all weaknesses must be remedied by mating with animals strong in these particular points. Always remember that in-breeding intensifies faults as well as good points.

Success follows best the studied efforts of line-breed-

ing rather than of in-breeding or of unwisely selected out-crossing. Line-breeding is the safe, conservative method, between the extremes of out-cross and in-breeding. It also intensifies excellence or faults, but this method permits the correction of the latter better, as the infusion of the blood of other animals for correction is a much slower process, and when employed in herds of high excellence of all breed qualifications, its fruits generally show the wisdom of its practice. The infusion of any direct out-cross in the herd oftentimes proves as disastrous as the failures of too close in-breeding.

Practically all successful breeders of live stock employ the principles of line-breeding coupled with a few dips into in-breeding, with occasional infusions of distinct out-blood. Generally speaking, breeders that practice out-cross breeding indiscriminately have disastrous results, although some crosses may produce individuals of high merit, the next may bring the undesired conglomerate results. In fact, the only road to success lies through breeding and building up through individuals of families of the same blood lines.

CHAPTER XX

THE IDEAL BIG TYPE

TYPE in porkers is the result of evolution of breeding, market, climate, foodstuffs, cost, profit and the breeder's fancy. In evidence we find all of our high standard breeds and types originating back to the primitive or wild hog. While a few of these breeds are distinctive exponents of a certain type, the great majority are subdivided into many different types, each type being more or less analogous to all, and each having its own peculiar and distinctive superiority of worth and usefulness.

The question of ideal type in any breed is controlled largely by the general purpose and utility of that particular breed. Should the type be lard, the breed's success lies along the proven ideals of conformation for this type, and if it be bacon, the ideals for that type hold true. The popularity of any breed depends largely upon its type possessing adaptability to meet and fulfill the general demands of pork producers and consumers. The high and low points of the popularity of any breed are always marked by its high or low standards of merit and quality, or plainly speaking, its adherence or departure from the pork producing type.

The lard type breeds first gained public recognition as distinctive breeds mainly from their size, adaptability to the corn belt feeds and climate, prolificacy, easy feeding and quick maturity. These breeds, by the aid of many "master-minded" constructive breeders through the sixties and seventies, were placed upon the highest

pedestal of fame, which prestige they enjoyed undisturbed until their form and utility began to favor that of the small or exclusive lard type, which was further augmented by "exploiters," rather than breeders, until a drastic change of type became necessary to save them from losing position. How well the breeders of today have succeeded is evidenced by the return wave of the big types' popularity and their general adoption by breeders and feeders.

Practically every breed of swine is subdivided into types, and the popularity, especially of the larger types, depends much upon their ability to furnish practically any form of pork products of the highest quality in the shortest period with high profit. Full matured, big type, breeding boars and sows should not be considered ideal market hogs, themselves, but as the pork producing machines which will make market pigs anywhere from six months to a year old that will top the market in any season. The selection of breeding animals is much similar to that of grains. For example, even when the largest, best ears of corn are planted, the field will still yield many common ears and nubbins. The reason is that retrogression is manyfold stronger than progression. Hence, the best and biggest must be used for seed purposes, to even hold the advancement made in generations.

The general analysis of each type and its concrete worth and results reveals the fact that no certain type alone can or has achieved entire success and that due credit must be given to each and all, not so much separately, but mostly in combination. A close study reveals that the greater credit is due to the type that is somewhat similar in size to the early-day Poland-China, possessing the present high standards of the big type pork producing animals. Assuming the foregoing to be true, our ideal of standard for "Big Type" breeds should be aligned for a type that may be properly termed as the

“Big Combination Type,” one which embraces the most desirable qualifications and rejects much of the undesirable ones of the big, the medium, the breeders’, the packers’, the farmers’, the feeders’ and the show yard types.

Success in all breed undertakings depends largely upon the degree of power with which Nature has endowed the hogs and how well it is used. Most prominent of these are positive and negative forces, represented in the different breed conformations or types, by the big or small, the slow or quick maturing, and other contrasting qualifications which are the “keys” that “constructive breeders” use to build, improve or evolve any desired type or breed. Constructive breeding creates and controls largely the success and destiny of types and breeds, but breeding alone will not construct or hold type, as much depends upon feeding and care; for retrogression of size, maturity and prolificacy is especially rapid in any breed or type when the feed and care is of a nature contrary to the best development.

To promote and aid retention of size, prolificacy, vitality and maturity, the foodstuffs of “Big Type” hogs should always be of a developing nature,—a ration largely of legumes, pasturage, coupled with wheat, oats or barley foodstuffs, with but a small ratio of corn or heating foods. The essentials for growth and development are the muscle and bone building foods, analyzing high in proteins and mineral elements,—the limes, phosphates and potashes are basic for fullest development of all plant and animal life.

Without condemning or favoring any certain type as representative of the “Big Type,” an ideal lineation of type is submitted that was set up to “shoot at” by an old time breeder and successful showman, a breeder who is generally accredited with being the real originator of

the present day "Big Type" Poland-China, a "constructive breeder," whose motto always was "to breed the kind good enough for the farmer and pork producer." The following is an outline of his ideal of type for a pork producing animal, irrespective of breed, white, black or red. A close study will reveal the objectionable and recommendable characteristics of many individuals of our present accepted big and medium types, and can be made to apply to any of our present day lard breeds.

THE IDEAL BIG COMBINATION TYPE

Head—Medium size, broad, slightly short, plain faced, tapering evenly to end of nose, surface even and smooth. *Objections*—Long or narrow between eyes, too coarse or uneven, too short or snub nosed.

Eyes—Full, expressive, prominent, clear, free of surrounding wrinkles. *Objections*—Dull, weak or narrow between, blind, fat covered or too small.

Ears—Medium size, attached to head with short, firm knuckle; free and easy action, well controlled, medium thin and soft. *Objections*—Too large, coarse, floppy, drooping, big knuckled, thick or too small, fancy or unproportioned in size or contrary to breed.

Neck—Full, wide, medium, short, even, well arched, rounding with due regard to sex. *Objections*—Long, thin, flat, shallow, drooping, uneven, wrinkled or creased.

Jowl—Medium full, broad, smooth, firm, carrying fullness well back to shoulder and brisket. *Objections*—Too large, loose, flabby, wrinkled or thin, and not carrying fullness back to connecting points.

Shoulders—Broad, oval on top, even with back line and neck, carrying good evenness of width from rib-line to line of belly. *Objections*—Narrow at either top or bottom, creased, uneven width or depth, disproportionate sizes or excessive shields or development of lower part.

Chest—Large capacity, of good width, depth and fullness, showing an even under-line and of giving plenty of room for vital organs. Of good heart girth and good width between fore legs. *Objections*—Narrowness, lack of depth of fullness, tucked up behind fore legs, small heart girth or narrowness between fore legs.

Back and Loins—Straight or slightly arched, good breadth, carrying same width from shoulder to ham, smooth, even surface free from lumps or creases, showing well sprung ribs that fill to

a straight edge, laid from point of shoulder to point of ham, shorter than lower belly line, but permissibly a trifle higher at loin than at shoulder. *Objections*—Narrow, shed-roofed, sway backed, creased, wrinkled or humped, uneven in width or fullness, not connecting evenly with other parts.

Sides and Ribs—Full, smooth, of good depth and length, firm and free from wrinkles, carrying size down to belly line; ribs well sprung, of good length and in line with shoulder and ham, altogether giving a slightly rounded square form and of carrying a high per cent of loin, bacon and ham meats. *Objections*—Side flat, flabby, thin, tucked up, uneven or creased surface; ribs too short, flat or weak, lack of rounded spring at top or bottom, lack of length or width, not in alignment with points of shoulder and ham.

Belly and Flank—Belly line, straight with fullness and width having ample room for digestive organs. *Objections*—Belly line uneven, narrow or sagging, flabby, pinched or tucked up, flank cut up too high.

Ham and Rump—Hams, full, long and deep with good width, extending well down to hock, fully developed above, very wide at point of hip, tapering toward the hock; round and plump in appearance, symmetrical with connecting points. Rump, rounding and sloping gradually from loin to root of tail, well developed, upper part symmetrically connecting with ham, back and loin. Brood sows should be of greater width through the hams than through the shoulders. *Objections*—Ham, too short, narrow, round, slim, undeveloped, unshapely or cat-hammed, lacking width, or cut up too high; rump, too narrow, too steep, sharp or too peaked, unfilled, or uneven with connecting points.

Fect and Legs—Medium length, straight, wide apart and squarely under body, tapering down to hoof; of fine texture, firm, and round below knee, with short pasterns, set nearly upright, over short, tough, firm feet and hoofs, free of defects and standing well up on toes. *Objections*—Legs too long, slim, coarse, and not tapering in size from body to foot, too light muscled, long, weak or crooked pasterns, legs set too close, hocks out of line, hoofs too long or weak, crooked, spraddled, broken down or turned-up toes.

Tail—Of medium length and thickness, tapering to bush, well set on, carried with style, smooth having medium brush. *Objections*—Coarse or too long, small or too fine, short, crooked or stubby, ropy, uncurled or too bushy.

Coat—Fine, straight, smooth, close lying, body fully covered, evenly distributed, excepting underline. *Objections*—Hair too coarse, bristly, harsh, rough, dead-like, wavy or curly, with swirls, standing up unevenly distributed, too fine or insufficient in quantity.

Color—Conforming to breed. *Objections*—Not conforming

to breed or having pronounced signs of "breeding back" in color or markings.

Size—Large for age and condition; quality must accompany size, animals having extraordinary size, bone, weight and maturity, along with high pork production stand pre-eminent above others; breeding animals should be fully developed and weigh at least seventy-five per cent of show form weight. Two year old show boars should weigh from 700 to 1000 pounds; two year old show sows from 550 to 800 pounds; yearling sows, 400 to 600 pounds; yearling boars, 550 to 700 pounds; senior yearling boars, 600 to 800 pounds; senior yearling sows, 500 to 700 pounds; under one year boars and sows, 400 to 500 pounds, approximately according to exact age, feed and other controlling conditions. *Objections*—Overgrown, gangley, too coarse, unsymmetrical, "wolfy" or "wild hog," angular, sun-fish shaped or hard maturing, too fine, small boned, short, stubby, chubby, undersized, too quick and small maturity.

Action and Style—Action vigorous, easy and graceful, style attractive with good high carriage. *Objections*—Sluggish, awkward, waddling gait, lazy or low carriage.

Condition—Healthy, flesh evenly laid on, soft and mellow, free from wrinkles or lumps, scurf, sores or scales of good easy feeding qualities. *Objections*—Unhealthy, flabby, creased or lump-fleshed, too fat for breeding, poor feeders, serious physical defects, harsh coat, scabby skins or otherwise showing bad conditions.

Disposition—Quiet, responsive to good treatment, natural good exercisers. *Objections*—Wild, cross, restless, stubborn, or too sluggish.

DISQUALIFICATIONS

Form—Too large, sun-fish shaped, shed roofed, too coarse or too small, of extreme narrowness between eyes or of chest, drooping ears that impair the sight, or extremely small or fine upright ears. Weak, broken in two or sway-backed, crooked or deformed legs, bones too soft, spongy or too small. Broken down pasterns or feet, deep creases back of shoulder on back or sides, or any serious deformity or defect not desirable to transmit to offspring. *Size*—Overgrown, gangley, monstrosities, or small, short, prematurely maturing or only of extreme advanced ages.

Condition—Excessive fat, barren, deformed, diseased, blind, swirls or curly coated, or of evident hard feeders, or of too slow maturity.

Pedigree—Ineligible to record or scoring less than seventy per cent.

Color—Radically different from that of ideal or having tendency to breed intermittently.

CONCLUSIONS

Hogs are produced for pork products and profits. The well finished 175 to 300 pound hogs cut up for pork products of the highest desired qualities. The 600 to 1200 pound hogs are not desirable for pork purposes. Small sized and boned, quick maturing hogs will not produce desirable pork animals as rapidly, profitably nor so opportunely as the big types.

The big framed hog will produce the desirable weight and quality pork hogs in the least possible time at the least cost and with the most profit, and at the same time, hold much more of the powers of prolificacy, vigor, scale, utility, etc., against the even downward influences of retrogression than will the smaller types. This accounts for the choice of the big type by practically all breeders and feeders.

Do not construe this to mean that the "Bigger the Better" nor "No matter how big so they have quality." All breeding animals necessarily must be big, as they are the "Seeds" to produce pork hogs with, but the mistake can be made by attempting to breed hogs of the "Elephant" or "Prehistoric animal type," just as well as by using the "Dinkys." The extremes should be avoided. The best big types are the ones that grow naturally big on the home grown foodstuffs with average good care and have a good "Big Type" ancestry.

There are three prominent types of big types,—the "Natural Growths," of good bone, scale and general utility; the "Artificials," being of fair bone and scale fed and fattened to immense weight and size; and the "Mastodons," freakish in height, length, bone and general conformation.

CHAPTER XXI

THE BREEDER'S TYPE

THE Breeder's Type should represent the highest ideals of any breed. All breeding animals should possess great scale, vitality and a conformation highly indicative of ideal for great promise in reproduction, and to be practically free from any serious defect. They should not be put into service until matured. The continuous practice of breeding immature boars and gilts will result in low, weak vitality, uneven sized, unthrifty and low power disease resistance litters of pigs.

None but the best should be retained as breeders. The practice of selling the big, well doing gilts and keeping the runts, bad doers and survivors from the ravages of cholera and other diseases leads but to ruination of type, breed production and profit of that hog herd.

The following is an outline standard of points for an ideal breeding animal, especially of the lard type.

Size — A most important essential. Very large for age. Well developed and accompanied with considerable quality. Two years and over boars should weigh 700 to 1000 pounds in show form and from 450 to 800 pounds in breeding form. Yearling and senior yearlings should weigh 500 to 900 pounds in show form and 350 to 700 pounds in breeding form. Boar pigs should weigh at least 200 pounds before they are used in service. Two years and over sows should weigh from 600 to 800 pounds in show form and from 350 to 700 pounds in breeding form. Yearling and senior yearling sows should weigh from 450 to 700 pounds in show form and from 300 to 500 pounds in breeding form. All gilts and under year sows should weigh at

least 200 pounds before they are bred. The increase of weights, especially of the minimum ones, when accompanied by quality and high breeding conformation is more recommendable.

Back and Loin—Broad, well arched, carrying an even width from shoulders to ham without depressions or lumps. The loins should show high development, very full and wide.

Sides and Ribs—The sides of good depth, even, smooth, of good length, showing fullness and good capacity for digestive and reproductive organs. Ribs well sprung, both top and bottom of good length and in line with shoulder and ham.

Belly and Flank—Belly broad, straight and full, showing a good capacity for digestive and reproductive organs. Underline straight flank well let down. Belly neither flabby nor sagging and having at least ten well developed teats, and no more than fourteen.

Ham and Rump—Ham broad, full, deep and good length and width, fully developed, extending well down to hock, tapering down from the widest point through the hips and symmetrical with all connecting points. The rump rounding and sloping gradually from the loin to root of tail. All breed animals should show high development in the chest, back, loins and hams. Brood sows show greater width through the hips than through the shoulders. Rough, big shouldered, masculine appearing sows are rarely ever good brood sows. Boars should show masculinity in both head and shoulders.

Chest—Large and of good width between the fore legs, of good depth and showing a full even underline and capacity for the heart and lungs. Free from creases, tucked or cut up features and to measure in girth about that of the loin.

Feet and Legs—Of medium good size and length, straight and tapering from top end to hoof, set wide apart squarely under the body, well muscled above the knee. The bone of a firm texture and of round shape below the knee. The pastern short, nearly upright, with short tough feet and hoofs, free from defects and standing well up on toes.

Condition—Healthy and of good vitality in good flesh, slick coated, clean skinned and free from wrinkles or lumps. Neither excessively fat nor thin.

Disposition—Naturally quiet and easily handled.

Action and Style—Attractive and of free, easy and graceful carriage.

Quality—General fitness for purpose and high character of all points and parts, especially as a breeder and producer of highly desirable pork animals.

Head—Medium large, broad between the eyes, tapering to end of nose, of fairly good length, rather straight faced, clean cut and not too short or dish faced. Shape of head is indicative of the power and state of vitality and breeding.

Eyes— Full, expressive, clear and unimpaired.

Ears— Medium, good size, clean, rather thin and well muscled, firmly attached and well controlled by animal. Not too coarse, lopping, too large or too fancy.

Neck— Medium good length, good depth, the top slightly rounded and arched, even, smooth without wrinkles or lumps, well connected. Boars should show considerable fullness denoting masculinity.

Jowl— Fairly full, firm and smooth, neither over- nor under-developed.

Coat— Fine, straight, smooth and evenly distributed.

Color— Near ideal of breed.

Tail— Medium length and size, tapering and carried with some style.

Symmetry— A close similarity and regularity of form and shape of all parts of both sides of the body, making each side an almost exact counterpart of the other.

DISQUALIFICATIONS

Immatured, undersized form, contrary to sex, excessive fat, barrenness, blindness, too chubby, too quick maturing, too hard feeding and too long maturing, diseased, hard skinned or harsh coated bad feet, small number of teats, or having any serious feature or ailment that might affect usefulness as a breeding animal.

CHAPTER XXII

THE BACON TYPE

To meet the growing demand for leaner pork products, especially of bacon for export demand, the following breeds are meeting with popularity in furnishing these desired products: the Berkshire, the large Yorkshire, the Tamworth and the dual-typed Hampshire or thin rinds. The growthy, ideally fed 150 to 225 pound pigs of the big type lard breeds are also heavy producers of the highest quality bacon products. Strictly speaking, bacon breeds are a distinct type whose conformation is as follows:

Size: large.

Body: long and deep.

Back: slightly arched, medium breadth.

Loin: strong and full.

Ribs: well sprung.

Hams: well developed at top.

Shoulder: good size and smooth.

Head: rather long and plain

Nose: tapering.

Jowl: clean cut.

Ear: medium large.

Legs: medium length, bone good size, standing up straight.

Their ideality conforms closely to that of the natural grown hog reaching back towards the primitive. It is believed that hogs of this type fed and cared for properly,

to perpetuate themselves, possess the highest states of vitality and prolificness of any breed.

The highest quality bacon products are secured from pigs weighing from 175 to 225 pounds.

Denmark, Great Britain and Canada have developed these breeds to their highest states of perfection, while the United States from the prevalence of corn and other fattening foods, coupled with the lard type's ability to produce greater gains of weight and profit, has not until late years accepted the bacon type very seriously. Many packers do not recognize that there is a distinct Bacon Type. Regardless of this, the bacon type is here, and its popularity will grow each year, as the present and future factors of successful pork production demand a more equal recognition of type, and considerably more attention to the production of the naturally grown, big, healthy bacon type hogs.

CHAPTER XXIII

THE LARD TYPE

THE lard or fat type is more representative of the American hog, which is primarily produced for its meats and fats.

The Big Type Lard Hogs are also dual purpose to a certain degree, but where corn is the staple, they are usually developed and fattened to their highest possible states as meat and lard producers. The lard type also represents closely the packers', farmers' and show types, and constitutes by far the greater part of the total of hogs produced and slaughtered in America. In conformation they should be of fair size, possessing a good strong frame and bone to carry their great load of highly carried meats and fats. It is essential that they have a good capacity for, and well developed vital and digestive organs.

The lard hog is generally produced and fed under high pressure, hence every part of him should be of a nature to harmonize and aid in producing the limit. The lard type is denoted by compactness of body, short, well-boned feet and legs, broad, well-covered backs, heavy hams, deep, well-filled sides, fairly heavy shoulders; head fairly short, tapering rapidly to nose; jowl rounded and full; neck full, ears rather small and fine; disposition rather quiet, contented, and easy-feeding and rapidly-maturing qualifications.

The leading exponents of the lard type breeds are the

Poland-China, Duroc-Jersey and Chester White; the Spotted Poland-China, Essex and Cheshire are also lard types, and the Berkshire and the Hampshire or "thin-rind" also qualify as belonging to this type.

The finished lard type hogs range in weights from 225 to 300 or 400 pounds when marketed, to furnish meats of the highest quality.

CHAPTER XXIV

THE PACKER'S TYPE

THE packers do not favor any certain breed or type, favoring neither color nor breed. Their choice is determined largely by the actual performance of the hog in cutting up a high percentage of high value products, with the minimum of low wastages. Pedigree or popularity does not bear any influence either, except wherein they promise high results in yielding qualities. The high grade, low grade, or cross breeds that can furnish the desired products look just as good to the packing house buyer as the most fashionable pedigreed hog. Thus, the hog market becomes the supreme and final court where the worthiness of every hog is measured by supply and demand. And be they black, white, red or spotted, their individual fitness to make the packer money determines and fixes their value.

One of the leading packing firms makes the following suggestions to those raising hogs for the packing houses:

“All of the recognized breeds are good. There is not a standard breed of hogs from which market toppers cannot be raised by the man who knows how to raise hogs for profit. There are good and bad in all breeds. The Berkshire makes pork of high quality. It is prepotent, so that it makes a desirable cross with grade or common sows and it is fairly prolific. The Poland-China is of the first rank as regards early maturity, and pure bred boars of this breed are used quite generally for

crossing with common sows. As a feeder the Chester White ranks high. They are prolific and the quality of the pork is good. A superior point of the Duroc-Jerseys is their early maturity. The breed is also noted for its prolificacy and pigs from common sows sired by Duroc-Jersey boars feed well.

“All of the above popular breeds are of the American or lard type of hog. The Hampshire breed is usually classified as a lard type by some authorities and as a bacon type by others. This shows that it is superior in that it can be fed to produce either character. If the Hampshire is persistently fed corn for several generations it loses much of its bacon producing character and becomes a fat hog. The breed is also noted for its fecundity, litters of ten and twelve pigs being the rule. Among the bacon breeds the large Yorkshire is superior. The boars of the breed are prepotent and cross well, and the sows are prolific. The Tamworth is also a large breed and ranks high as a bacon hog. Their fecundity is a striking feature. The breed is probably unsurpassed in this particular and the sows are good mothers.”

Uniform Loads Bring Premium Prices: Loads of hogs having uniformity as regards quality, finish, breed, color, size and type bring better prices than do mixed loads.

“The farmer who contemplates raising pure bred swine for breeding should study all of the breeds, their good points and bad points. He should study his own conditions, such as climate, feeds that can be produced, etc. Also, he should study the markets and make a determined effort to understand the points which go to make a market hog. After this preliminary course in ‘hogology,’ he may be considered competent to select his own breed. However, the man who is already a hog raiser may say, ‘I am perfectly aware that my sows are not of the right

type, but they are all young and I do not want to sacrifice them.' Such a man need not despair. A pure bred boar of the right type, and one which is especially good in the points where the sows are deficient will soon correct the difficulty. The raising of pure bred or registered pigs for market cannot usually be done with profit, but there is no breeder with more than two or three grade or common sows who should not have a pure bred boar."

Good Sires Improve the Herd: "It is not necessary to have a Masterpiece, or an international prize-winner, a Chief Perfection or a Colonel M. Everybody knows that the sire is half of any herd. He is more than that, for if sows are selected from animals raised on the farm, the sire is half of the first generation, three-quarters of the second, seven-eighths of the third and so on. Furthermore the character of the sire influences so many more pigs than does one dam, that it is not only important but necessary to have the sire better than the dam. If a pure bred boar is used he is almost sure to be prepotent over the grade or common sows and if the practice is continued for but six generations, only one and one-half per cent of the original unimproved blood will remain. The farmer who has only a few sows and feels that he cannot afford a pure bred boar, can usually find one or more neighbors in the same fix who will gladly join together to buy one. If the sows generally are poor in the ham let the boar be especially thick and full there. If the loin is not well covered the sire should be especially superior in the back; and if the sows are not prolific let the boar come from a family that is noted for its fecundity and let the boar be one of a large litter. The sow he serves will then show an improvement in this particular over their dams."

The following is a broad description of the packer's type. The head, rather small, and in proportion to body;

ears, of medium size and of good breadth between eyes; face and jowl, clean cut; nose, medium and tapering to the end; neck, rather short, with shoulders wide and full. Back and loins, full, even and wide, connecting evenly with shoulders and hams. Sides, long and deep with well sprung ribs. Heart girth, equal to that of loin. Good width between both fore and hind legs, showing good capacity for vital and digestive organs. The preponderance of meat development being of high carried meats, especially of the hams, loins and bacons, with the minimum of low down meats and fats in the jowl, shoulder and belly line, and showing a low dressing wastage.

While it is recognized that good, firm bone is essential to properly develop and carry the animal from farm to killing floor, this quality becomes objectionable in those that are extremely coarse boned, rough, heavy shouldered, jowled, big bellied, low fleshed and fattened, having a high per cent of flabby soft meats and fats. These are termed as "low dressers," from having a high wastage in dressing. Rough brood sows, stags, and unfinished hogs are examples of this class.

The packer's choice is also controlled to some degree by the consumer's demand, which changes in accordance with season, and other factors. The packers, broadly speaking, classify hogs in accordance with the pork products that they furnish. The range of weights averages as follows:

Prime Heavy Hogs	300-400 lbs.
Heavy Butchers	260-300 lbs.
Medium Butchers	225-260 lbs.
Light Butchers	175-225 lbs.
Pigs	80-120 lbs.

Prime Heavy Hogs: As the name implies, prime finished hogs usually weigh 300 to 400 pounds. They are

usually barrows, and from 10 to 16 months old. They represent practically the highest limit and form of hog fattening possible to obtain without getting them too fat and coarse for the best market demand.

Heavy Butchers: Broadly defined, the smooth, heavy or heavy loin hogs are either barrows or sows that are smooth and prime, well finished, having 3 to 4 inches of back fat, weighing from 260 to 300 pounds.

The Medium Butcher Hogs are those weighing from 225 to 260 pounds, smooth and well formed, having 2 to 4 inches of firm lard back fats.

Light Butcher Hogs: As the term implies, this covers hogs of a weight and certain conformation best adapted to furnish fresh pork cuts. The 175-225 lbs. smooth firm fleshed barrows, having from 2 to 3 inches of clear white back fats, are highly desirable, and the 180-210 pounds, smooth, well finished loined and back fatted barrows and clean sows are widely used by the packers and butchers for fresh pork products as loins, butts, shoulders, and for fancy smoked products, as hams, shoulders, bacons, etc.

Packing Hogs: All hogs of mixed weights that are too coarse in quality, of too rough a conformation, uneven, or of too soft, flabby, low quality flesh and fats to be used to secure the above desirable, high class fresh or smoked products, are termed as packing hogs, and are graded into certain cuts after they are butchered, but the greater bulk of packing hogs are packed as dry salt and pickled pork. One-half of all hogs slaughtered are classified as packing hogs.

The heavy packing hogs are mostly old brood sows, stags, grassy and unfinished hogs, weighing from 275 to 400 pounds and over. This class produces the lowest quality and priced packers' pork products.

Bacon Hogs are those that are suitable primarily for

sugar-cured, breakfast bacon bellies and English meats. The leading qualities of bacon hogs are long, deep, smooth sides, with a light, even covering of fat over the entire carcass, especially on the back and sides. The hams are full and lean, and shoulders light and smooth, flesh firm, fats solid. The range of weights run from 90 to 170 pounds dressed, but those weighing from 120 to 150 pounds dressed are usually most desirable. They consist principally of barrows, but smooth clear sows of these weights of high quality and finish are also used. Only a very small per cent of hogs slaughtered can be so graded. The products made from them are known as "Cumberlands," "English Middles," "Domestic, Breakfast Bacon Bellies," long and short cut hams.

Bacon Hogs vary in grades, as "Choice," "Good" and "Common." The Choice being evenly fleshed cover, with a smooth evenly distributed layer of firm white fat, being from $1\frac{1}{4}$ to 2 inches over the back. This grade furnishes the "Cumberlands," "Wiltshires," "Staffordshires," "English," "Back Bellies," and fancy breakfast "Bacon Bellies." The "Good" are those that lack the prime finish of the choice in one or more essentials. They usually average from 110 to 170 pounds. They furnish much the same cuts as the "Choice," but of a slightly inferior quality. The "Common" are those below the average in finish, weight and quality, generally averaging from 90 to 110 pounds dressed.

Shippers are similar to Butcher Hogs in shape and quality, but are lighter in weight and are not generally so well finished, having a moderate covering of fat and but very little leaf fat. Compared with Bacon Hogs, they are shorter and thicker bodied, having deeper fats and heavier jowls. They usually weigh from 100-160 pounds and are dressed head on. Their chief use is for fresh retail trade.

English Bacon Hogs are light weight hogs having long, deep and smooth sides, with a light but even covering of fats, especially over their sides and back. The quality of their flesh and fats is very high, showing firmness and whiteness of fats and skin. The hams full, shoulders light and smooth; sides of good length, full and even, cutting as strips of bacons having the highly desired streaks of fats and leans. In fact, the term "bacon hogs" on the markets today as far as domestic bacon is concerned, is a misnomer, for approximately only ten per cent of the light weight of a hog can be turned into what is known as fancy Breakfast Bacon.

The difference in per cent of bacon between a so-called lard type and bacon type is so small that scarcely any premium could be paid for live hogs for bacon purposes only. On the other hand, Export Bacon consists of a very large percentage of the hog's carcass. The "Cumberland Cuts" and "English Middles," and "Dublins" are the main export bacon cuts. The Cumberland cut is practically the whole side, excepting the jowl, spare ribs, and ham.

Pigs: Pigs embrace practically all hogs weighing under 120 lbs., and less than 6 or 8 months of age. While the pig should weigh around 100 lbs. at 4 or 5 months, the great majority do not until 6 or 8 months of age, as the most of young pigs are forage raised; hence the quality and weight classify pigs more than does age.

The desirable points of pigs are smooth bodies with light colored flesh and thin clean skin. The extreme thin, coarse or staggy pigs are classed as "throw outs." Pigs weighing from 80 to 100 lbs. are cut up for fresh meat trade into pork chops, steaks, roasts and boiling meats. Pigs weighing from 30 to 100 lbs. are chiefly used for fresh pork trade, as pork chops, steaks, etc., while the pigs weighing from 15 to 30 lbs., commonly

known as "sucklers," that are smooth and fat, are called "roasters," the most desirable weight being 15 to 20 pounds.

The majority of pigs going to market are shipped on account of fear of disease, scarcity of feed, or oversupply. The majority are purchased by feeders, hence pigs as a class are not recognized as staple "porkers" by the packers.

Roughs or "*Throw Outs*" are the hogs lacking so in condition, form and quality that they are too coarse to grade.

Stags are castrated boars, selling with a dockage of 80 per cent, on account of wastage in dressing and usual coarser quality.

Boars: On account of the sexual odor of their meat boars are usually condemned for meat, and bring only fertilizer price. Boars should not be marketed. They should be castrated and fed until well finished stags.

Dead Hogs are all those arriving at the yard dead or condemned for food purposes. They are tanked for fertilizer.

CHAPTER XXV

SIZE, QUALITY AND FINISH

WHILE size is commonly accompanied with strong prepotency and vitality, the higher states of quality, prolificacy or general fitness as breeders, feeders and pork producers do not increase with greater size. It is almost impossible to set a certain size or poundage limit for hogs of any breed, but most breeders recognize that there exists such a limit to retain the essential combined qualities.

Most breeding boars begin to lose considerable quality when they mature at above 700 pounds in breeding and 900 pounds in show form, and few boars retain sufficient quality to be regarded as exceptionally worthy individuals at above 800 pounds in breeding and 1000 pounds in show form. While some boars actually do attain 1000 pounds or more, and yet retain much commendable qualifications, such are very rare despite the advertisements and assertions to the contrary. The value of such boars is almost priceless.

Size should be made of secondary importance in the selection of breeding animals instead of first as practiced by many breeders who follow popularity instead of striving to build it themselves. While 1000 and 1100 pound boars make good advertising matter, size unless accompanied with considerable quality and free from many other serious "big hog" defects will, if indiscriminately mated for a few generations, develop retrogression

of type and breed, instead of holding or improving it. Extreme sized individuals are usually of a slow maturity, hard feeders, rough frames, coarse lopping ears, shed roofed backs, rainbow back-lines, loosely connected, being oftentimes practically cut in two, at top or bottom, and finish with a surplus of low down and low priced fats.

The freaks, giants or midgets, of any form of animal life, so far as breeding value is concerned, should be classed as unnaturals, as they cause retrogression rather than improvement of type or breed. Had Nature intended hogs to be elephantine of size and conformation, the primitive hog would have been such and our process of domestication would be entirely wrong, but centuries of type and breed building proves conclusively that Nature, domestication and the demands of civilization require and favor above all others the big-medium, early maturing, well developed and fairly compact formed hog.

Breeders and showmen attain great sized animals by various methods, some grow a big framed hog along until about two years of age and then fatten to an immense weight. Such are really of too slow maturity; while others develop and fatten to the limit a medium type hog, perhaps of rather small frame and bone, to a great weight. Neither type is really acceptable as they really represent the extremes of type in the breed. Their real value is for advertisements or as freaks than as breeders. The real "Big Type" is the "naturals" that are bred big and good and are "good doers" in the breeding, feeding and show yard.

THE SIZE OF BONE

The size, structure and quality of the bone framework of hogs is very essential for successful pork production. Hogs, possessing good size with well connected frames whose bone texture is firm, close and of good strength

are usually of good vitality, health, easy carriage of body and natural good grazers and rustlers. The exercise that such hogs are enabled to obtain promotes better appetites, digestion, assimilation, elimination and ultimate better health, growth, thrift and finished products. The size of bone does not always indicate strength or ideality; while considerable size is necessary, its quality becomes paramount. In fact, extreme, large sized, soft, spongy constructed bones are more objectionable than are extremely small bones of high quality. Generally speaking, quality diminishes rapidly when the bones exceed 8" in six months pigs, 9" in yearlings, 10" in senior yearlings and 11" in two year old boars. However, many individuals possessing high quality still retain a good quality of bone, at and above these measurements, sufficient to qualify them as breeding animals of high merits, but very few can carry this to over an inch excess, hence, 12" seemingly marks the limit of bone size in two year old boars.

The character of bone structure is outwardly evidenced by the shape of the body frame coupled with that of the head and legs. The ideal conformation being about as follows: head and snout of medium size length, and slightly straightfaced; the feet and legs of medium large size, showing a roundness of shape about the pastern joint, set straight under body and tapering in size down from body to the feet. The animal should stand up well on the toes without resting on the dewclaws and carry the body free, easy and graceful. The coarse, crooked, "clydesdale"-shaped leg bones or weak, straddling, broken down feet and toes are objectionable, if not disqualifying. Remember, size only becomes highly recommendable when accompanied with good quality and without many serious objectionable features.

The good size and quality of bone is both bred and

fed into the hog. Growing hogs require a larger balance of bone building elements in their rations than matured hogs, excepting brood sows, especially when pregnant or suckling their litters. It has been determined that when pregnant and suckling brood sows are deprived of sufficient bone building elements in their rations, much of the bone material contained in their own system forms into foetal fluid or milk, so that their pigs may receive sufficient bone material. This is one reason why many brood sows break down in the back or hind parts. The prevention is to feed plenty of high bone muscle building foods as alfalfa, oats, bran, etc., and to keep for free access a mixture of wood ashes, charcoal, lime and salt.

MEASURING HOGS

Many breeders place considerable stress upon the large measurements of their breeding animals. Large measurements, like big size, should be accompanied by quality so that such may be regarded of value and merit. Otherwise extreme large measurements may be a demerit to the animal.

The rules commonly followed in measuring are as follows: To find the length, measure the distance between the eyes and root of tail. For heart girth, measure the distance around the body, just back of the fore legs and back of shoulders. For loin girth, measure the distance around the body just in front of the hind legs and hams. For height, measure extreme height of the arch or top of loin above the ground. For bone, measure the circumference of the hind leg about midway between the hock and pastern joint, this being the largest place of the round shaped bone.

Some breeders wrongfully secure extreme measures of length by including the nose and sometimes the tail,

or by holding the tape loosely or taking advantage of the position the hog is standing in or of measuring the largest part of the place. The correct way is to hold the tape tight around the place, with the hog standing in a natural position; not with the head down and back humped or head high in air and back swayed.

QUALITY AND FINISH

The meaning and application of these terms is seemingly confounded by many hog men. Quality always precedes finish and broadly defined quality describes all the qualifications of the animal; it is the character and stamp of excellence of any point or part of the hog, either individually or collectively. Thus the qualities of the hog embrace all of the following: The breeding—feeding—developing—maturing—shipping—show ring—and pork producing qualifications. The better the animal is in combination of these marks the higher it may be regarded in quality. Such quality should be made the dominant factor in the selection of all efforts in swine production.

Qualifications of breeding rightfully come first, and to further aid the breeder to select and breed wisely, all hog record associations should form an Advance Registry Association, somewhat similar to that for dairy cattle. From its records the performances of the boars as breeders and of sows as mothers of ideal formed, healthy, good sized, easy maturing litters, can be used as a guide and measuring stick for future efforts. This will also aid to cull out the “boom” and “show yard” types that often produce retrogression of the pork producing ability and popularity of the breed. While high show yard quality is recommendable and needful for any breed, it must not be the predominant one; it should

represent only the highest state of quality and finish of an individual of a certain breed.

The combined high standard of a breeding conformation is the most important factor of quality. Of these, prolificacy ranks first, coupled with prepotency to perpetuate high power and state of being. Motherhood, the nursing and rearing of good, even sized, healthy litters, follows. Of the feeding and developing qualities every feature that has a bearing upon the highest ideal should be considered, notably the states and power of digestion, assimilation, easy feeding, rapid and high developing. It should be of a type and size termed as the "big, mellow, growthy, stretchy, good doing" kind, in conformity to that standard of the breed. The shipping qualifications of the hog should be such that he could easily carry himself about without much exhaustion and withstand considerable rough usage and deprivations incident to handling and shipping.

The show ring represents only the highest possible states of quality and finish combined, in certain individuals, without any serious defects that might be termed as a disqualification. Fat, barren, championship show hogs are oftentimes fit only for market purposes and many show men dispose of them in this manner after the season is over.

The pork producing quality represents first the power of production and ultimately the final dress of the hog in high finished pork products. This being really the object of hog raising, it is of vital importance, second only to breeding and prolificacy. The presence of quality is generally denoted outwardly by evident health, thrift, evenness, maturity and size; also by the hogs' promise of general fitness as breeders, mothers, feeders and producers, and adaptability for any intended pur-

pose of use. For instance, all gilts intended for brood sows should be selected of those having ideal brood sow conformations, and from litters whose ancestry records are of a high healthy prolificacy, number raised, and having performance as pork producing animals. All others should be sent to the fattening pens, regardless of personal desire or circumstances. Quality is also denoted outwardly by the character, construction and condition of meats, fats, bones, hair, skin, etc.

Finish follows quality, it being the term to denote the extreme highness of the hog's state of being in quality; the final touch of superior excellence or quality possible to secure in a hog. A hog of high finish possesses high combined quality and an evenly, well developed and fattened, symmetrical form, without roughness, creases, lumps of over-developments; being fine coated, thin skinned, strong, hard boned and of medium large conformation, maturing lard types. Extremely finished hogs usually have small silky ears, pretty shaped heads, glossy coats, thin skins, small curled tails, and carry excess of fats in the jowl and underline and reach full maturity at around 300 pounds.

It is not possible for all hogs even of the same breeding to arrive at the same states of finish at the same time, on account of inherent factors and the peculiar condition of each individual's health, care, feeding, etc., but they should measurably be very similar to that of their breed, type, feeding and care. While the score card of excellence does not include quality and finish, do not forget that they enter into every point of it, being the yardstick by which all the good of the hog is measured.

CHAPTER XXVI

BREEDING BROOD SOWS

AFTER brood sows have been fed a growing and developing ration for a sufficient period to bring them into a full bloom of maturity, they are ready to be bred. Spring gilts should, with good care and feeding, be in proper condition for breeding about November or December of the same year, and fall gilts should be ready to breed about May, June or July of the following year.

Older sows that have raised a litter of pigs should be fed into condition after they have weaned their pigs, so that they will be in proper form to conceive and develop the foetal litter. It is not necessary that they be in full breeding form, for after they begin to show evidences of filling up and rounding into form, the continued feeding of a developing ration brings them quickly into desired condition.

Thin or suckled down sows demand the highest balance of fattening or heating elements in their rations. It is advisable to increase the heating balance in the rations of all brood sows prior to the intended time of breeding to stimulate their animal passions.

When the intended brood sow is observed as being in heat, during the breeding season, she should be removed from the bunch and placed by herself, in a small and tight enclosure. This removes much of the danger of injuries from being ridden, or riding other sows. When the sow shows evidence of being in full heat, which is

usually the second day, she should be taken to the pen of the boar, and given one good service, then taken back to her enclosure and kept there until her period of heat is over, before being returned to her former quarters with the other brood sows.

In case that the sow does not catch or come into heat again, investigation should be made for the cause. Oftentimes this is from the practice of allowing sows of all ages and sizes to run together in large bunches, or is due to some injury, or from certain feeds, unsanitary quarters or some slight ailment. Such a sow should be removed from the herd, placed in separate quarters and be fed a high stimulating ration, and given ideal care in order to have her in good condition for the next breeding. Should the sow again fail to breed, it is advisable to market her and proceed to give time and attention to more likely ones, as such failing sows may be the primary cause of abortions or other kindred troubles in the herd.

When the sows prove to be pregnant, they should be bunched together as nearly as possible in the same size, age and disposition. It is best to pair them together in small yards of an acre or so, that have a well built house and pasturage within their enclosures.

Here the brood sows should remain during their period of pregnancy, to be removed only a few days before farrowing to the farrowing house.

HOUSING THE BROOD SOW

The kind and nature of housing and quarters for the brood sows, their sanitary condition and care, are very important essentials of success.

The sleeping house should be roomy, with tight, dry floors, and free from draughts of air. The side walls should be without cracks or openings. All openings should be provided with proper doors and windows for

ventilation and sunlight, and the roof should be un-leakable. The floors may be of cement, planks, or hard packed dirt. They should be slightly elevated above the surface of the ground and free from drains of surface or roof water, also provided so as to drain themselves from inside collections of water or moisture, so that they will be dry at all times. The floors should also be constructed to prevent slipping or straining. The sleeping quarters should be rebedded once a week with clean dry bedding, free from dust, chaff, germs or parasites.

Various experiments made upon the effects of shelter on the welfare and gains of weight by brood sows commonly agree that at least 25 per cent more feed is required in open, cold, damp houses than in ideal, sanitary constructed and maintained ones. Fattening hogs require slightly less additional amounts, while the young pigs, thin or suckled down sows require about 50 per cent more feed when improperly housed.

The feeding ground and immediate vicinity should be kept free from all obstructions, refuse or litter that would in any way endanger the health or safety of the brood sow. All cobs, bits of wood and other burnable debris should be raked into piles and burned into ashes, or charred into charcoal at least once a month.

The feeding floors and sleeping quarters should be disinfected with some standard disinfectant at regular intervals, and the hogs should be sprayed with some good lice killing solution every few weeks, to destroy and prevent the ravages of lice and parasites.

Water slacked lime is one of the best and cheapest disinfectants of common use for the sleeping quarters, for scattering over the yards, purifying the water, and for use in mudholes, etc.

High grade oils, with the addition of 2 to 4 per cent of standard germicide or cresol dip, give excellent results

as a spray to kill lice, and so keep the skin in a fine, healthy condition. The use of hog oilers or rubbing posts is also recommended. Common crude oils are extensively used, but their bad feature is the excess of carbon.

Artificial heat may or may not be needed in the farrowing house, according to the season of the year, climatic conditions, etc. The better plan is to avoid artificial heat if possible, as heat maintained above 80° for long periods will produce harmful results. The young pigs become too warm, sweat, chill, catch cold and develop serious and fatal ailments of the respiratory tract. When artificial heat is used in the farrowing house, the heating plant or stove should be some distance from the newly farrowed litters and the temperature of the house be kept even, without sudden drops or rises. The heat in the pens should not rise about 80°. Many hog producers prevent chilling and supply warmth to the newly farrowed litters by using boxes or baskets containing a jug of hot water, or with hot bricks or stones wrapped in cloths to prevent burning. The pigs are placed within these and covered up, between the intervals of suckling, during the first few hours of their life.

THE CARE OF BROOD SOWS DURING FARROWING PERIODS

Practically every successful hog raiser keeps a system of records of the breeding and farrowing dates of his brood sows. Many keep a record of the individual performance of each sow. These records are very useful and essential. A simple way to keep a record is to nail up a board in the central hog house, tacking a few cards thereon, and writing down all the data, as they occur. To preserve and keep a more definite record, a regular book register should be purchased, frequently transcribing therein the data from the daily diary, kept in the hog house, with all other data pertaining to each sow and

litter. Systems of record will enable the breeder to keep an accurate record of the performances of every individual in breeding, feeding, maturing and ultimate profit.

The hog man, by observation of the sow's outward signs and condition, can detect without consulting the register the ante-farrowing symptoms at least two weeks before, that is, the sow by this time should be "making bag" rapidly. This is about the proper time for the brood sow to be removed from the rest of the herd, and placed in her intended farrowing pen.

These pens should have, in connection, yards of a sufficient size so that the sow may secure plenty of exercise every day. The sow should either be confined alone, or with one or two other sows, of about her own size and disposition, but no other stock should be allowed to run with them. All possible care and precaution must now be observed to prevent injury or harm befalling them. All objects or probable causes for such should be removed from their enclosures, and the sows should never be allowed or forced to crawl under fencing, over or under sills, through narrow places or to use slippery or highly elevated feeding floors.,

The farrowing pen should be warmly constructed, free from drafts of air, dry, clean and provided with good ventilation and sunlight. The materials that such houses are constructed of are not so essential as the manner of the construction and the condition they are kept in. Cement floors are cold and damp, plank flooring has cracks and corners for filth. However, the cement floors can be made warm and dry by the use of false wooden floors during farrowing time. The bedding should be dry, clean and free from chaff or dust, and moderate in amount. The brood sow's rations should be gradually eliminated of the heating elements. This generally means dropping corn almost entirely. The ration should become more

laxative and cooling in nature. Ground wheat, oats, shorts, bran or middling slops, with an occasional small amount of linseed oil meal added, or tankage, with liberal amounts of alfalfa hay, make an ideal brood sow ration during and following the farrowing period.

If the care, attention, feeding and other minor things have been attended to as near as possible to that of the ideal, much of the prevalent pigging troubles, with the accompanying ones, will be minimized. It is believed that fully one-half of the ailments and fatalities occurring in newly farrowed pigs is caused by the absence and lack of proper care, attention and system of feeding the sows and litters during this critical period. Particular care should be given to the disinfection of the farrowing pens, especially just prior to and during the suckling period, to prevent scours, parasites, arthritis, etc.

When the sow shows more evident signs of farrowing and the date shown by the records is but a few days away, the hog man should observe closely for approaching signs. One of the infallible ones is the exudation of a watery-like fluid, sometimes found by stripping or milking the teats. This usually occurs about 36 hours before farrowing. This gradually changes to a white, milky-like fluid, eventually thickening into heavy, sticky milk just before the farrowing event. Another sure sign is the action of the hog's primitive instinct to collect and arrange a nest of straw, hay and debris. The disposition of the sow also becomes somewhat cross at this period, and she resents the approach of other animals, especially dogs. When these signs have appeared, the sow should be placed securely in the farrowing pen, it being much better for her to have been confined during the first signs than in the latter ones, as she will be more reconciled to her quarters. Oftentimes the sow will resent being shut up in a close pen and will worry and en-

deavor to get out, if not accustomed beforehand to the place, especially so if she has been allowed to construct a nest elsewhere. Should the presence of man seem to annoy the sow, while she is making the nest, or in the sickness preceding and during farrowing, it is best to avoid bothering her more than necessary. Should the sow show any disposition for food before farrowing, only a small amount of luke-warm water should be given her. If the sow does not resent the presence of man, considerable attention may be given her, to make her feel more at home and quieter. Every move made by the man should be slow and quiet, loud talking or quick movements should be avoided. After the sow has taken a recumbent position and is sickened with pre-farrowing pains, it is not best to disturb her, only to see that the pigs as they arrive are clean of the tissue of birth sack around their mouth and nostrils, and that they reach their teat and begin to suckle.

If the sow has been wisely chosen, developed and cared for properly, the aid of man will be little needed by the sow during the farrowing, as the pigs will be strong and vigorous and the sow will prove to be a matron of the highest order.

It always pays to be close to the sow all during the farrowing period. This saves many pigs annually. On the other hand, some men overdo this by being too officious, noisy and bothersome, causing the sow to become nervous and restless, so that they may withhold the flow of their milk, and causing them to be constantly getting up and down, and to trample or lay on some of the pigs.

Always remember that newly born pigs must suckle at the mother's udder as soon as possible after being farrowed. All delays tend to weaken them, and to be fatal of result if they are too long. If possible, rub each pig dry with a soft cloth and be quick to clean the mucous

covering over nostrils and mouths of the pigs, and if any show lifelessness, a gentle massaging of the body will usually restore breathing, and after a suckle or two, they will be as lively as the rest. After it has been observed that all the pigs have suckled several times, and that the mother is resting easy, the hog man may turn his attention to other matters, such as removing and burning the afterbirth, occasionally dropping in to see how the youngsters are coming along. The next few days are very critical ones in the pigs' lives, so the care and feeding of the mother and pigs is very important.

The black teeth may or may not be removed. There are 8 in all. Sometimes all are long and sharp and cause udder and canker trouble. If offending the best method is to break all offending ones off close to gums with a pair of forceps and treat antiseptically, with a solution of permanganate of potash.

It is not best to feed the mother anything unless it be luke-warm water, for at least 12 hours after farrowing. Her first real foods, about 18-24 hours later, should be light and laxative of nature and small in amount. The flow of milk and evidences of its richness, and the portion each pig gets should be taken into consideration in the balance and nature of her future feedings. If the milk is rich and the supply large, the balance need not be so developing, on the contrary, a little more of a concentrated dry nature. After a few days, the ration can be slowly increased to that for sows and litters.

Brood sows sometimes have a depraved or morbid appetite during and following farrowing, having an inclination to eat their pigs. This is caused by fever, or the lack of mineral matter, or protein in the previous rations. Meat cracklings, tankage or fleshy meats may be given them, but this may effect scours in the young pigs. If the sow persists in eating the pigs, they should be

removed and kept in a warm box between their periods of suckling. The feverish condition usually passes over in a day or so, and the pigs can be safely returned to their mother's side.

The general average of newly farrowed pigs of high class, well fed dams, ranges from 2 to 3 lbs. and that of less desirable and poorly fed sows ranges from 1 to 2 lbs. approximately.

CHAPTER XXVII

CARE OF YOUNG PIGS

THE successful production of pigs is based practically upon the same principles as raising children. They that understand and best apply the basic principles will be the most successful. It is difficult to outline a certain plan of feeding and care that would apply generally, for nearly every locality has different foodstuffs, environments, types, breeds and climatic conditions; in fact there does not exist the man who can compound an exact pig ration.

The sanitary care and feeding of the sow and litter is the most important feature for the first few weeks. If this be passably good, the pigs should develop rapidly and naturally, without any serious ailment or setback. The Golden Text of pig raising is to "Start right and keep right," for if by any cause the little pigs are thrown out of balance for any period of their early life, they will always afterwards bear the marks of this setback. The life of the hog is set, as the saying goes, "fast and furious." Their life is timed to accomplish full maturity in the short space of one year, hence their days mean months to some other forms of animal life, and what they do in life must be accomplished quickly without serious setback. Hence the importance of starting right and keeping right, for it is more difficult and costly to recover the ground lost by ailing and stunted pigs than to have given them the most exacting care and feeding.

Usually these conditions are caused by improper breeding practices, such as inbreeding, cross breeding, incorrect matings of type, breed and individual conformations, incorrect sanitation, indifferent, indolent care and the improper feeding of the dam, the lack of or nature of her milk or being pushed aside by stronger or robber pigs.

Scours, constipation, indigestion, thumps, canker sore mouths, may also appear as results of bad feeding and sanitation. All troubles, singly or in combination, cause serious setbacks, hard to overcome, and to regain the time lost in the development of vitality and body.

The incorrect feeding of the dam for the first few weeks usually causes scours or constipation in pigs. Rich foods and lack of exercise cause constipation, while unwholesome, improper, irregular and sudden change of temperature of foods usually cause scours. For this reason never give ice cold water. To correct constipation of the dam, a light dose of Epsom Salts may be given and light feedings of bran and alfalfa.

To correct scours in young pigs, the sow may be given a physic of castor oil, also cut down the richness of feed and increase feedings of charcoal, lime, sulphur, etc. In severe or chronic cases tincture of opium and tincture of catechu, one-half teaspoonful each, in light slops fed to the dam after the physic has been effective will tend to check and restore any pigs to normal condition. A tablespoonful of soda, Epsom Salts and ginger, equal parts, in the sow's feed twice a day is also effective.

Sunshine is the agency to fill out the bodies of newly farrowed pigs, imparting strength and health. Pigs cannot live without sunshine any more than can plant life, so it is very important to arrange that the little pigs may bask a few hours daily in the warm sunshine in some dry protected place free from cold drafts of air or dampness. Exercise is another important factor. Pigs that lie in

their nests become too fat and the working of their digestive tract becomes impaired and unnatural. Thumps, scours and other digestive ailments result. It is a good plan to have the pigs take exercise with the dam by the time they are a week old. They should not be allowed to trail with her through the mud or snow, nor to take excessive exercise, but considerable of a light nature can be arranged for daily, either in or outside the house, even during the inclement days of February and March.

The suckling of each pig should be observed closely for the first few weeks. Oftentimes stronger pigs will crowd away the weaker ones and monopolize two or more teats and force the others to depend on the partial flow of one. Again, the teats of the sow's udder are never of the same capacity, some teats furnishing more milk than others. Pigs that use the small supply ones usually show evidences of lack of food in their bodily appearance, being runted and stunted of growth. These troubles are usually hard to correct. While some breeders believe that each pig is farrowed for its own certain teat and finds it immediately, many breeders perhaps rightfully believe that all pigs acquire their certain teat to suckle by habit, after birth. Personal attention, forcing the stronger pigs to be content with one certain teat, and seeing that the weaker ones are not robbed, and in some instances the substitution of cow's milk, helps the litter along until other arrangements for a full food supply to each pig can be arranged for. In some instances, a part of large litters can be transferred to sows having small litters. This should occur during the first few days, and the litters be of practically the same age.

The ration of the brood sow should never be excessive in fattening or heating elements, and should be wholesome and pure, fed at regular times and in moderate amounts. The consistency of the feeds should be of a

bulky and wet nature. Slops and pasturage for this reason are good for brood sows during the summer months, and the bulky combination of alfalfa hay ground with grains and fed in a steamed and soaked state proves best during the winter and spring months. Shorts, bran, oats and tankage in proper ratios are ideal.

Another important factor in the care of pigs is the removal of the tusks or black teeth, should there be any appearance of harm by them. A small pair of forceps or pliers can be used to nip them off cleanly at the base. Care must be observed to do this thoroughly and carefully, so that the snags will not cause ulcerations or open the way for the invasion of the necro-bacillosis germ. A good plan is to dip the pig's mouth in a weak disinfectant or antiseptic solution, such as peroxide of hydrogen, permanganate of potash or blue vitriol.

The sanitary condition of the sleeping nest and housing quarters must be kept as near ideal as possible. The beddings should be changed every day or so, kept clean and dry and free from drafts, dust or dirt. The mother should not be allowed to drag her udder through mud and filth and then come back to pollute the bedding with germ life of all descriptions. Little pigs contract canker sore mouth, parasitic troubles, blood infections, scours, arthritis and many other troubles, from filthy germ-polluted bedding and quarters.

Little pigs cannot thrive when covered with parasites. Lice and mange are the most common ones to contend with. In order to keep these menaces under control, it is advisable to either spray the sow with dip solutions, medicated oils, or to use oil rubbing posts or dry dips. It is not best to directly apply the disinfectants to young pigs, as their skin is too tender. They will secure enough by contact with the mother's body until large and strong enough to receive it direct. Air slacked lime and coal

ashes may be used freely under the bedding as an absorbent of moisture, a deodorizer and disinfectant, every time the pens are cleaned.

By the time that the pigs are a week or so old, it should be arranged, if possible, to place the mother and litter in an individual house located in a small patch of pasturage. Running here with their mother the little pigs learn the secrets of life. This is their schoolroom, where under their mother teacher they learn the tastes of all feeds and acquire habits and the power to use them, daintily nibbling at some leaf or stem of succulent plants, nosing in troughs or in the soft earth, chewing and cracking grains. They soon acquire the "knack" of eating, gradually building up their appetite and power to secure and use a little more each day until they are depending as much upon such feeds as upon the milk of their mothers. The feeder can now arrange to place tempting feeds, such as sweet cow's milk, soaked corn, oats, shorts, slops, etc. where it will be of easy access to them, small pens with "creeps" arranged are very handy, always underfeeding, never overfeeding, and removing what food they leave, gradually increasing the amounts given until the pigs will come readily for their feeding or be found waiting for it to appear. Then the pigs can be fed stronger day by day, and the preparation for weaning instituted. Always note the pig's condition, and the evident effects of foods and probable appetite before each feeding.

By the time the pigs are six or eight weeks old and they are subsisting on foods mostly, the feeding of their mothers should be made of a higher fattening nature, and by the time that the pigs are eight to ten weeks old, the weaning can be effected with little harm to either mother or pigs.

SORE TAILS

Suckling pigs are very susceptible of becoming afflicted with an irritation and inflammation at and around the base of their tails. This is caused by pig scours and consequent infection perhaps by the bacillus necrophorous. If the causes are not removed, and some attempt made to treat the affected tails, inflammation will cause an open sore, cracking open around the tail base. The blood circulation will be shut off, causing the end to become deadened, and eventually dry up and drop off.

The treatment is to clean up the sleeping quarters, disinfect and attempt to check the scours through the food of the dam. The local treatment is to wash thoroughly the affected tails with a boric-acid or permanganate of potash solution, followed by greasing it with a good healing oil or ointment. Sperm oils and salves for udder troubles in sows, or mentholatum are best to use. Peroxide of hydrogen is also a good cleanser to use before the application of antiseptics and healing ointments.

MARKING PIGS

Breeders use several systems of identification marks on hogs to insure a correctness of breeding, and also of ownership. There is really no one best method, as every system has a drawback. The most commonly used systems are metal buttons in the ear, a system of notches cut in the ear, indelible tattoo marks, holes punched in the ears, split and cropped ears, and rings inserted in the ears.

The ear notching method, seemingly, gives the best of results. Of several systems employed in making and reading the designating notches, the following are believed to be the most practical and popular.

No. 1 — This system is based upon assuming that a mark in a certain part of the ear represents a certain number. Hence, a mark close to the tip, on the underside of the right ear, represents 1, a mark a little lower means 2, a mark near the middle means 3, one near the butt means 4, a mark on the top of right ear means 5, a mark on top of left ear means 10 and a mark on the underside of right ear means 20. Thus, a hog with two notches on top of left ear, one underneath left ear, one on top of right ear, and one close to tip underneath of right ear, would read number 41. This system can be arranged to mark 100 pigs or litters, by adding more high numbering marks.

No. 2 — With the use of a record book, to serve as a key, the litters of 100 sows may be kept with the following system. Figure that the notches in upper side of right ear mean 20, that notches in the upper part of left ear mean 10, that notches in the tips mean 5 and notches in the under sides of either or both ears, mean 1. Thus, if a pig has two notches in the upper right ear, one in the upper left and a notch in either tip, the pig would belong to litter number 55; if he has seven notches all told in the undersides of his ears, he would be individually number 7 of litter number 55. To make such marks a common harness punch may be employed by using only one-half of its circular cutting circle.

The best time to mark pigs is while they are still suckling, or when about two to four weeks of age. All breeders should use such a system, not alone for personal benefits but for protection to their customers.

CHAPTER XXVIII

WEANING PIGS

WEANING time brings a new epoch in the pig's life, and much depends upon how the pig has arrived at and enters this new state. Breeders differ somewhat in their methods of weaning, being governed largely by local climatic conditions, foodstuffs, customs, markets and other controlling influences. In any method Nature should be followed closely. Don't be in too great a hurry. The pig's appetite should be developed gradually during the suckling period, to use skim milk, forages and grains, until they eventually depend mostly upon these for food.

A good pasture of alfalfa, clover or other forage plants will supply them with succulent protein and mineral elements with a bulkage and water content to balance and neutralize concentrated foods.

Corn is one of the first grains or concentrates for which suckling pigs acquire an appetite. Do not force any food directly upon suckling pigs, for they naturally at first acquire a taste for food and a sufficiency from nosing in their mother's feed and when their appetites have grown keen and stronger, arrangements then can be made for the suckling pigs to creep through into little pens of their own, where a few handfuls of corn or corn and oats, slops or oats alone, or a small quantity of shorts slops, with a small allowance of warm cow's milk can be supplied to them every morning and night. The feeder now must be doubly careful of overfeeding and of the wholesome nature and cleanliness of the food.

Cow's milk is the best supplement to any pig's ration. It should be fed either direct from the udder or separator, never sour, rancid or unwholesome. As the pigs' appetite and capacity for foods develop, it will be noticed that they care less for the milk of their dams, suckling at longer intervals, and if they are responding favorably to this pre-weaning ration, it is advisable to make preparations for weaning to take place at from at least eight or ten weeks of age. Nature under such conditions will greatly assist in making this event a success.

The sow's udder should now show some signs of drying up, and the sow show an evident desire to cease nursing her pigs. To effect final weaning, the mother sow should be placed in a tightly enclosed pen safe from access to or by her pigs. In the morning, after feeding, the pigs should be driven to the far end of the pasture lot, and when they return to their feeding quarters be given light feedings of milk, slops and corn, at intervals. In this way, the long first day may be shortened and their dependency on foodstuffs alone better established. The pigs may be given a "night cap" of sweet cow's milk that evening, later securing them in a tight enclosure where there is no possible chance of their getting out and finding their mother during the night, nor of their mother getting to them.

The next day, feeding should be a stronger repetition of the first, thereafter gradually increasing the ration as the pigs' appetite and capacity enlarges. Avoid over-feeding and give great care to the nature of the food, which should be well balanced. Skim milk 3 parts, soaked corn 1 part, or corn 1 part, short slops 1 part, skim milk 1 part, with tankage to season, makes a good weaning ration.

Properly managed feeding and weaning of pigs eliminates many undesirable results, such as runts, stunted,

uneven, backward, ailing or diseased pigs, producing on the contrary, litters of even size, thrifty growth, healthy and possessing good power of digestion, assimilation, and free from most little ailments that impair natural development from baby pignood to pig maturity. Many hog raisers develop the pigs' appetite and capacity so well that the pigs will practically wean themselves.

The separation of the sexes and castration of the boars should occur shortly after weaning. They may be castrated before weaning, but the best time is about two weeks afterwards. They should not be allowed to run longer, as younger pigs stand the ordeal better in practically every phase.

CHAPTER XXIX

PIG FEEDING

“BABY pigs” are “little porkers” in the making, that step by step grow into full matured hogs. Pig feeding really commences with the mother sow, starting with a well balanced ration for the pregnant sow and following it with one for the suckling mother, all favorable for the construction of growth, bone, blood, health and vitality, — not for fat and heat.

The baby pig, like the infant child, learns first to suckle at the mother's breast, slowly acquiring an appetite and dependency afterwards for other foods. A natural procedure promotes healthy growth and gradual building up of power of digestion and assimilation. Young pigs should never be crowded in variety or amount of food — it is best to let them have much their own way, especially in the beginning.

Much of the future worth and use of every pig depends upon Nature and analysis of the nutrient elements secured from the mother's milk, which is controlled largely by the nature of foods eaten by the mother. The feeding of a well balanced ration, never too excessive in fats nor of overbalance in proteins, produces milks favorable for the building of better blood, bone and tissue. Either overbalance for long duration may set up digestive disturbances of the stomach that later may become chronic and seriously arrest the growth and future worth of the pig, eventually subject to one or many pig ailments or

diseases. The digestion of mother milk by the suckling pig starts with its being mixed with the saliva of the mouth, then with the gastric juices of the stomach, where the combined action of these fluids has what is termed a "splitting up" or preparatory action, fixing the different nutrients into proper form, so that they can be absorbed through the walls of the intestines, and carried to the different parts of the body, to build and replace tissue, bone, muscle, fat, etc. This process is called Metabolism, or plainly speaking, the continuous process by which living cells or tissues undergo chemical change, — tearing down and rebuilding.

Should disturbances arise in the process of digestion and assimilation, the digestive fluids lose their natural character and power to split properly, and to fix the nutrient elements for proper assimilation, so it is of importance that the nature of the feed and feeding be such as will promote and conserve the highest natural and healthy action.

Over, uneven or radical changes in pig feeding, especially the over-balancing of rations in fats or proteins, will cause disturbances and make blood lacking in proper digestive juices or fluids. Consequently a part of the food nutrients will enter the blood during the assimilation process in an incomplete state, and be the cause of unnatural ailing conditions. As such matter cannot be used by the body, a form of poisoning of the whole system may result, eventually causing the wasting rather than the upbuilding of the body.

After the pig has grown in size and appetite to consume and properly digest grains, foodstuffs and forage in considerable quantities, the balances of the rations should still be largely for development of muscle, tissue, bone, blood, etc., with a slightly increasing ratio of fat and heating elements.

To secure the best results, any pig feeding ration should be of proper ratios of corn, oats, milk, tankage, oilmeals, alfalfa or clovers, with free access to a mixture of wood ashes, charcoal, lime and salt.

It is practically impossible to give a certain ration for pig feeding, which fact most pig feeders readily recognize. The only rule is to observe closely the pig's condition, the appetite for and consumption of the farm produced foods. The mainstays are corn, wheat, oats, milk, alfalfa and clover, raising and lowering amount and variety according to best judgment. This practically means hand feeding until at least six months of age. Experience does furnish an absolute ration to adhere to.

In feeding shoats and brood sows during the winter time, substitutes for the green forages of the summer time must be provided, to give bulk and volume of food, that the stomach may be fully distended and the digestive tract work properly. Alfalfa, clover, hay, root crops, ground oats, shorts, bran with corn makes a splendid ration. Skimmed milk or buttermilk adds to its ideality, and sheltered feeding floors with access to clean, even temperatured water, and to ashes and salt, coupled with good sanitary housing, practically assures gratifying results.

A 50 pound pig will consume from $1\frac{1}{2}$ to 2 lbs. of dry feed daily such as corn, along with forage, water and milk, and a 75 to 100 pound pig will require 2 to 3 lbs. of concentrates in order to make natural healthy growth of body. A trifle heavier ration is necessary to fatten pigs.

Pig raising should be the most popular business in agriculture, as none other will give the husbandman quicker, better or more profitable returns. While cattle and sheep feeding may be easier and cleaner, they do not give near the same poundage of meat returns for grains

fed. The hog conserves the grains fed, while cattle and sheep waste their food values.

Pigs produce about one pound of meat from 4 or 5 pounds of dry food matter, and furthermore utilize practically all by-products, thus acting as farm economists.

The summary of 500 feeding trials by different state feeding farms is given :

Range of Weight of Pigs.	Average Pounds . Daily Consumed.	Pounds Consumed. per Cwt.	Average Daily Gain.	Pounds Feed for 100-lb. Gain.
15-50	2.2	6.0	.08	293
50-100	3.4	4.3	.08	400
100-150	4.8	3.8	1.1	437
150-200	5.9	3.5	1.2	482
200-250	6.6	2.9	1.3	498
250-300	7.4	2.7	1.5	511
300-350	7.5	2.4	1.4	535

Under 100 pound pigs make the best per cent of gains for amount of food consumed, and while their daily amount of foods eaten per 100 pounds live weight is relatively higher, their gains are economically much higher than that of 300 and 350-pound hogs.

The gain of suckling pigs is effected more economically, but it will take an extra amount and cost of feed to re-instate the mother-sow in good flesh condition.

It is estimated that a matured brood sow and average sized litter will consume from 600 to 700 pounds of corn and wheat shorts, and 1200 to 1500 pounds of skimmed milk, besides forages and water during the ten weeks suckling period. About one-third of the food is used for maintenance of the sow's body, the balance is converted into milk for the upbuilding of the pig's body.

CHAPTER XXX

FEEDING THE BROOD SOW HERD

THE brood sow should be fed, bred and cared for in a manner closely adhering to the laws of Nature, so that the brood sow may be well builded and endowed favorably for the reproduction of self and progeny. Almost every herd has different conditions to take into consideration.

Hence no certain rule or formula can be given to cover all. Success lies in selecting the right type and breed, caring for, feeding and breeding right, without end, in conformity to local demands and environment.

Foods that build bone, blood, tissue, etc., are basic brood sow feeds. The sow's body is largely constructed of the same materials as the foetal litter. The sow's storage of these materials is drawn upon during pregnancy and the pigs' suckling period. Large litters and under supply of building elements develop a very thin suckled-down condition of the sow during the later part of the suckling period. Many hog men overlook or forget this fact and attempt to build up brood sows and litters by feeding feeds high in fat and heat content, — for instance, corn. It is well to remember pigs are not constructed of fats — on the contrary they are largely of bone, blood, tissue, etc.

The commonly produced farm feeds nearest ideal for brood sow and pig feeding are alfalfa, clover, wheat, oats, shorts, bran, milk, etc. Corn should always be fed

properly, to give requirement of heat and fat. The addition of tankage or oilmeal is very beneficial to secure better a balance and ultimate results.

In computing the brood sow's rations, it is essential that the nutrient elements are balanced to give the animal the required amounts of building and growing materials without excesses, with a sufficient bulkage and moisture favorable for natural digestion, assimilation and elimination.

The protein and mineral elements are the most important of the brood sow's ration, being the elements that largely build up the bones of the frame, muscles of the body, and nerves of the hog's system. The fats, oils and carbohydrates are the elements that largely build up the fats of the body, furnishing the heat and part of the energy. These elements are stored up in the body in cells of fat, to be drawn upon and used in time of need, and for protection against cold, preserving an even temperature of the body, acting as cushions, protecting parts and organs from injury, wear and tear, also as a reserve to be drawn upon to sustain life in illness, etc. They have no important part in the function of any organ, nor of the life of the animal, outside of the above uses.

Water is one of the essentials for brood sows. Every farm should have an up-to-date watering system installed so that the brood sows may secure a sufficiency at any and all times. The water should be pure and of an even temperature the year round. During the winter, tank heaters will be found very serviceable. No fixed rule can be made of the correct daily allowance of water to brood sows, as they secure considerable in their bulky foodstuffs, such as slop, pasturage, etc. The better way is to give them free access.

All animal life requires certain amounts of various mineral elements daily to build up the wasted, worn out

parts of the body. Animals that are pregnant or suckling their young require larger amounts than do others. The blood also requires and uses large amounts daily in the processes of digestion and in repairing the waste cells of the body, so the brood sow ration should contain salts, iron, sulphur, sodas, potash, limes, charcoals, magnesia, etc. Many hog feeds contain high amounts of these elements, and they can be secured on the farm by burning vegetable matter, such as wood, cobs, straw, hay, etc., in the form of vegetable or wood ashes.

The system of feeding should be based largely upon local conditions, the foodstuffs produced, climatic conditions, etc. It may be either upon dry grains, pasture and forage, or upon slops, soaked or ground grains and pasturage. The main idea is to use the foodstuffs produced on the farm. The common and most profitable practice is to produce considerable pasturage and roughage that will be accessible to the sows and pigs during all months of the year.

Several acres of the hog farm should be put into alfalfa and clover, and all the yards should be arranged to produce forage plants such as alfalfa, clover, rape, oats, rye, etc., in season to supply the brood sows and their litters. Then the whole farm, especially the crop growing fields, should be enclosed hog tight, so that they may be also sown with rye, wheat, etc., for fall, winter and spring pasturage, and the corn fields planted in pumpkins and sown with rape for fall "hogging down." Such systems of range, pasturage and roughage will establish the production of pork on a scale of advantages, in cheapness of cost, general health and profit, impossible to duplicate by any other method.

The exercise derived by the sows in this system stimulates their desire to naturally take exercise; which aids in the digestion and elimination, effecting better health and a

more even development of the foetal litter, with consequent lessened farrowing troubles, stronger and healthier pigs.

The brood sow ration in general, prior to breeding, should be of a growing, gaining nature. The following rations can be made to apply approximately on any hog farm. From experiment it has been determined that a matured ideal brood sow gives to the suckling litter from 5 to 8 lbs. of milk daily on the average, for the period of about 80 days. The daily feed requirements to produce this flow call for about 4 or 5 lbs. of corn, 4 or 5 lbs. of shorts or middlings, and a free range of forages, and access to water, ashes and salt.

100 lb. Ration: For old sows and thin yearlings. Corn 50-60 lbs. Shorts or middlings, 15 lbs., bran, 5 lbs., oilmeal, 2½ lbs., tankage, 5 lbs., alfalfa meal, 5-10 lbs., water, ashes and salt. They require a more fattening ration.

100 lb. Ration: For young gilts and well developed young sows. 18-20 lbs. corn or oats, 15-18 lbs. shorts, 15 lbs. bran, 15 lbs. alfalfa, 25-30 lbs. oilmeal or tankage, 5 lbs. Separately or in combination, with free access to salt, ashes and water.

From practical experience and many experiments, it has been definitely determined that it takes slightly more feed to produce a gain of weight during the winter season than during the summer period. Perhaps an average of 10 per cent more is required to make the same poundage of gain.

FEEDING PREGNANT SOWS

The embryo and newly farrowed pigs receive all of their nourishment through the milk of their dams, hence, the feeding of the brood sow during pregnancy and through the suckling period is of the highest importance.

The more ideal that such ration be, the better will the pigs be, and for every departure from ideality, there will be marked evidences of such showing in the litter.

The brood sow should receive foods highly conducive to produce an abundance of bone, blood, tissue, fibre, milk, etc. The nature and amounts of foods may be regulated by the condition of the brood sow, state of flesh, evidences as a good mother and apparent effect on the suckling litter. Should the prospective mother be excessively fat, it is better to arrange the nature of her foods so that a large per cent of this may be taken up by the litter; which means the feeding of high bone and ash forming foods, with the almost entire curtailing of fat-forming foods. On the other hand, if it be evident that the brood sow's milk supply is below normal or insufficient for the litter, foods that are favorable for the increase of milk should be fed, and should the supply be above normal, the balance may be adjusted to slightly decrease the flow. Generally, the best way is to give an even balanced ration of corn, shorts, alfalfa, oats, oil meal, ashes, etc., slightly increasing the corn allowance through the suckling period. Shorts and oats should always predominate with free access of alfalfa and grasses. The oil meal or tankage ration should be very light in the beginning, slightly increasing with appetite and age, allowing the pig to grow up to his feed, rather than of forcing it to eat more than it really wants. It is advisable to give the brood sow small amounts of tankage, blood or bone meal, or oil meal, during pregnancy, but very little during the suckling period.

No certain hard and fast rule can be given for the exact amounts, or of the exact natures of feeds to be fed young pigs or brood sows. The feeder's success depends largely upon his personal observation, and ability to foresee and give the mother nearly correct rations of

feeds, and to keep all conditions of nearly even balance, never overfeeding, or radically underfeeding; on the contrary, always slightly underfeeding. In this manner, by keeping every organ and function of the mother in perfect tune and harmony, and the tender developing bodies of her offspring correspondingly forming into healthy little bodies, gaining of strength and inclination to soon handle foods properly by themselves, good, healthy, thrifty pigs are raised.

CHAPTER XXXI

GARBAGE FEEDING

FOR common purposes, garbage feeding may be divided properly into two practices: the feeding of kitchen garbage and of city garbage. The former is the use of the waste foods of private families and selected wastes of smaller restaurants and hotels. The latter embraces the garbage collection of a city, which usually contains the whole category of substances in all states of condition, food values and promise of result. The nature of the kitchen garbage is also often of serious doubt, from spoiled, decaying foods, and being sometimes impregnated with strong solutions of acids, alkali and washing compounds.

The city garbage's highly undesirable state is always questionable, hence it should be steam-cooked before being fed. City garbage is dumped into large, open steam kettles and the whole mass is cooked for several hours, to sterilize and better prepare it for feeding. The greater part of the grease is skimmed off and much undesirable matter, such as tin cans, bones, paper and glass, is removed. Then it is drained out through sieves that retain the smaller foreign matter, but much of the acids, alkalis and poisonous elements cannot be extracted from the mass, as they are held in solution with its liquid content.

The cooking and separation seems to overcome much of the possible harmful effect and hogs do exceedingly

well on garbage when it is properly balanced with corn or other high value grain foods. The methods of feeding being to either self or hand feed the grains and feed the garbage in troughs after it cools sufficiently. Strictly kitchen garbage can be fed in neutral state without fear of harm when balanced properly with grain concentrates and all harmful debris is removed.

The practice of garbage feeding has evolved a choice or type of garbage feeding hogs. Seemingly hogs that have been accustomed to it and bred within the confines of garbage feeding prove to be nearest to ideal. Their general description being an angular, long nosed, straight faced and well boned hog, irrespective of breed or color, with a good vitality and greedy appetite.

Excellent gains and profits are generally secured in garbage feeding, largely from the low cost of the basic food material. The most serious drawback being from poisoning, set up either directly by substances in the garbage or from chemical action resulting from either fermentation or by cooking. Matured hogs are less affected than are pigs. On account of the conglomeration of elements existing in garbage, this trouble is difficult to prevent or cure. The use of intestinal antiseptics such as permanganate of potash, blue vitriol, copperas, wood ashes and charcoal give aid to neutralize and correct the extreme acidity and enteric ailments arising from garbage feeding.

The pork product of strictly garbage fed hogs is really of a lower grade of quality and characterized by a flabby, non-elastic touch, grayish white of color, slightly disflavored. Sometimes pure garbage fed hogs sell for \$1.00 per cwt. under bulk market price. While it has not been proved that the fats and meats of garbage fed hogs are unwholesome, it is commonly admitted that they are not without question, especially when city gar-

bage is fed. The more wholesome the hog's food is so will the meat products be; and the more doubtful or rotten that the foods are, so in a measure may the meat products be. Hence, to safeguard the general health of all humans, all animals marketed should pass Government inspection and their feeding be at least fairly above suspicion.

Garbage hogs are peculiarly free from lice or other parasitic troubles. This is attributed to the greasy nature of their food, with which they are almost continuously in contact. Hence, a good oil or grease, containing a low per cent of some standard disinfectant, naturally makes the best louse killing or parasiticide preparation for hogs.

Some garbage feeders run the matter through steam digesters, concentrating the mass into what is known as garbage tankage. Most feeders supplement the garbage or garbage tankage approximately with whole or ground corn four or five parts, skimmed or butter milk fifteen or twenty parts, oil meal or molasses one or two parts, alfalfa four or five parts, and garbage ten or more parts. The feeding of a strong grain ration for the last 90-120 days finishes the hog for market and removes the question of quality of the meat products.

On account of the varying states of nature, uncooked or unsterile garbage will cause several different forms of poisoning. Oftentimes cooking and sterilization are of no avail, as garbage may contain certain elements unaffected by treatment. The symptoms of practically all cases are that of gastro enteritis; vomiting and diarrhea are usually present. The pig is markedly dull. It may die very suddenly or may linger for several days, either dying or recovering. The treatment is: First, remove the cause. Give emetics and strong physics and an antidote for the specific poisoning, if it be known.

CHAPTER XXXII

FORAGE FEEDS

THE importance and necessity of forage feeds for hogs is inestimable. Their common use and prevalence being so great, most hog men take them as granted, without thought of the necessity of studying or arranging to provide forages most abundantly, economically and resultantly. Hog men should understand that forage crops are Nature's basic feeds to grow and develop hogs of good natural size, health and high vitality.

Forages are comparatively rich in protein and mineral matter, the muscle-bone-blood building elements of foodstuffs, and are of high relish, cheap production, easy accessibility and most wonderful of result. An acre of alfalfa will give returns of increased weight and value in development and growth on pasturage in connection with the feeding of corn and concentrates, of above \$100 per acre, and in some instances \$200 per acre. No other concentrate or supplement will produce such results. The corn ration alone results in the highest cost and wastage of any practiced, but with forages added, the gains are increased from 20 to 50 per cent, and with a well balanced ration the gain is oftentimes 100 per cent or more.

The system of grazing also lessens labor and cost of handling and provides the hog with sufficient exercise, essential for the proper development of body and maintenance of good health. Most forages supply sufficient

natural laxative elements to regulate and correct constipation and enough of alkalinity to correct or neutralize digestive troubles, thus aiding to promote natural digestion, assimilation and elimination.

The bulkage, watery content and succulence of forage foods also aids materially in causing the stomach to distend to full capacity and ultimately develop all parts of the alimentary canal to their fullest capacity, state and power of digestion, assimilation and elimination. For example: One thousand horse-power engines cannot be driven to the limit with 20 horse-power boilers, nor can 300 pounds, 9 months old pigs be produced through quart sized stomachs.

The ranging of hogs freely over premises securing forages also aids greatly in effecting better sanitation, and in distributing rich fertilizing manure all over the farm.

As the meats produced during the developing period of animals is the cheapest growth or gain made, it becomes practically imperative that all hog raisers arrange an abundance of forages especially for brood sows, suckling and growing pigs, etc., during the summer months and supply other protein foods in either a hay, root or substitute form during the winter months.

The amount of grain to be fed to pigs and hogs running on pasturage, figuring alfalfa as a basis, depends largely upon whether the ration be developing or fattening, or for pigs, brood animals or fattening hogs. Young pigs seemingly make the best development upon about $\frac{1}{4}$ to $\frac{1}{2}$ grain ration, brood sows about $\frac{1}{2}$ grain ration, and fattening hogs $\frac{3}{4}$ to a full grain ration.

ALFALFA

Broadly speaking, alfalfa in any form, pasturage, hay or meal, cannot be excelled or duplicated by any other

form of forage food as a balancer for a concentrated ration. Alfalfa may be termed as the basic supplement for all grains used in hog feeding, whether it be for brood sows, growing pigs, or market hogs. The extreme high content of the ash or mineral element in alfalfa also fixes its value very high as a balancer of all rations. Alfalfa has many more times the amount of calcium and potassium found in corn. Alfalfa is also high in phosphorus, iron, soda and salts and its excess of basic elements neutralizes the acidity of many foods, thus effecting a better digestion and assimilation and aids to correct faulty and impaired digestions.

The feeding of alfalfa in any and all forms is especially remunerative in promoting growth of bone, body and better health in brood sows and growing pigs. In figuring the food supply and value of alfalfa it may be estimated that one acre of alfalfa will furnish sufficient forage for two or three brood sows and their litters, and cut from one to two tons of hay besides, or one acre will furnish enough forage for ten young hogs developing for market. While alfalfa may stand in some instances a little more hard usage for a season or two, the better plan is to limit its use even less than recommended, in order to retain the stand and to provide tender succulent growths the season through. It is advisable to mow the fields at least two or three times annually. This method causes the removal of the tough weedy stems that are mostly undigestible. The third, fourth or last cuttings are generally chosen for hog feeding, fed either in the hay form or ground into a meal during the winter time. This is greatly relished by all hogs. If the plan is to feed the hay in natural form, it should be stacked upon poles somewhere in the hog yard, or stored in hay mows adjacent to hog yards and fed scattered on feeding floors or in specially built feeding racks. If it is desired to

feed the hay in meal form, the hay can be chopped or ground with or without grains. The best plan is to mix the following combination: alfalfa 25 to 30%, corn 10 to 20%, wheat or shorts 15%, oats 15 to 20%, bran 15%, linseed meal 2 to 3% or tankage 2 to 5%, with free access to ashes and salt.

The feed mixture may be fed in either wet or dry state, in troughs or on feeding floors,—the better way being to place a sufficient amount for a single feeding in a tank or tight box, where it can be soaked or steamed for 12 hours, then fed directly to the hogs by scooping it into troughs, or on to the feeding floors. It is not best to allow this mixture to ferment nor the tank to become soured. The addition of a small amount of common baking soda is advised to keep the tank, boxes, barrels and buckets sweet and clean. The actual steaming should not last more than an hour or so. In no event should this mixture become cooked.

In computing the balance of grain feed in connection with alfalfa pasturage, four to six pounds of corn is generally used for brood sows, and fattening hogs require around ten pounds daily. The addition to the corn feeding of about one pound of shorts in slops, or $\frac{1}{2}$ to 1 lb. of tankage also increases the gain of growth and profit.

Where it is possible, every hog farm should have at least a few acres of alfalfa or clover in conjunction with other forage crops, that these may follow each other in season through the entire year. This will better insure the production of more pounds of pork at a lesser cost and hogs of better states of health and vitality.

RED CLOVER

Red clover, along with Dwarf Essex Rape, ranks next to alfalfa in value from all standpoints as a hog forage

plant. Clover is rather short lived, uncertain of stand, and lacks ability to withstand droughts and the elements, as does alfalfa, being really an annual plant of but two years' life and of but summer utility, usually too matured and woody for fall pasturage.

Clover is higher in fattening elements than alfalfa, and has practically the same amount of protein. Thus clover requires less of corn and more of supplementary foods such as tankage, milk, etc., than does alfalfa. Where climate, soil and other controlling conditions are favorable, clover should be provided in abundance.

There are several other standard clovers as Alsike, Crimson, and a small white clover, but all are of lesser value and usage than red clover.

DWARF ESSEX RAPE

Rape is a most commonly used and a very available and valuable forage for hogs. Its protein content excels that of alfalfa, especially when grown in old feed yards. This practice is especially recommended to aid in sanitation of yards and premises, as the cultivation and cropping of soils aids to prevent and destroy germ and worm infections. Hogs eat rape more readily when it is young and tender, hence it is best to sow rape every two or three weeks from early spring to the "dog days of August," in order to supply an abundance in its most tender succulent form.

Hogs should also have access to alfalfa or clover in connection with rape, and a light feeding of corn in amount according to intended purpose of feeding. Most hog men practice sowing rape in corn fields that are intended for "hogging down" during October and November, by sowing 3 to 6 lbs. to the acre during or following the last cultivation in June or July. The free access to such arranged fields and to alfalfa or clover

produces the highest results in growths, poundage and economical cost of food production.

Hogs running in rape during dews or rains are sometimes afflicted with blisters or sores. Thin or white skinned hogs are more susceptible to this trouble than dark, thick or heavy skinned hogs. The treatment to prevent and cure is to allow hogs access to oilers or devices containing medicated oils.

BLUE GRASS

Kentucky blue grass is a perennial plant grown in the greater part of the Corn Belt. It is a hardy, permanent forage of early spring and late fall usage. The hot dry months of July and August curtail its growth and usage, hence alfalfa, clovers and rape best fill the blue grass deficiency during this period.

Blue grass is relatively low in protein content, hence it must be supplemented with both protein and fattening foods such as corn, tankage, etc. Its common prevalence, low production, cost and availability highly recommend its universal usage, especially during the early spring and late fall months, when the tender shoots are most succulent and highest in protein content. The mineral content of blue grass is also very beneficial in supplying body and health building elements.

CANADIAN OR COWPEAS AND SOY BEANS

These forage plants grow best and furnish food for a longer period and during the most desired season, in the southern and southwestern rather than in the northern portions of North America. Their value and usage correspondingly decrease north of the 40th parallel, where they come into competition with the better available and longer season forages, such as alfalfa, clover, rape, etc. However, they are very recommendable for-

ages, and are a very valuable hog food, especially where other concentrates such as corn are not available at a low cost.

An acre of well podded cowpeas will pasture 15 to 25 pigs for about two months, and produce very cheap pork. Cowpeas are sown alone or with oats or rye in March or April, and are ready for pasturage in 40 or 50 days. Soy beans are first cousins to cowpeas and are about the same in production, value and usage.

Under favorable conditions, pigs running in either pea or bean pasturage make splendid gains, and do almost as well as when on alfalfa pasturage and fed a balancing concentrate. In "hogging down" peas or beans, it is best to confine pigs to limited areas. The ideal time to commence is after the pods have fully formed. Immature peas may cause kidney trouble.

SWEET CLOVER

The use of sweet clover as a forage is recommendable upon certain soils and under conditions wherein the growing of alfalfa, red clover, etc., is not entirely successful or practical. Hogs and other live stock relish and will give high and economical gains upon the tender shoots and first year's growth. They do not relish, consume or thrive well upon the mature or second year growths. Closer pasturage and frequent mowing of the second year's growth provides an abundance of the tender shoots. Never allow sweet clover to reach over 18 inches in height for forage use.

The carbohydrates, protein and mineral content of this plant are practically the same as of alfalfa and clover, and it also contains a bitter, aromatic, stimulating property that acts more as an aid than a harm to the process of digestion.

There are several species of sweet clover; either the

white (*Melilotus Alba*), or the yellow (*Melilotus Officinalis*) are recommended. Never attempt the use of the annual yellow (*Melilotus Indica*). Sweet clover, like red clover, is of a two year life, and if not allowed to bloom, cannot seed itself for re-occurrence. Sweet clover seems to favor growth in limestone, clay or poor soils and its deeper rooting system produces green forage for a long period, and aids greatly to fertilize poor soils.

GREEN RYE, WHEAT AND OATS

The provision of both rye and wheat for late fall, winter and early spring forage is a very recommendable practice. The protein content of both wheat and rye during these periods is similar to that of alfalfa, clover and rape. Excess of rye in some instances produces scours or extreme laxativeness in young pigs, when the corn, tankage, ash and salt allowance is too low.

Pasturing rye or wheat is not practical or beneficial after it reaches the heading period, unless it be to secure the scattered grains on harvest fields impossible to cut by the usual methods. Either wheat or rye with oats sown in combination furnishes ideal late fall and early spring pasturage. While these plants are not over 6 or 8 inches high, they contain a higher per cent of protein than do alfalfa or clover. Such pasturage is ideal for brood sows and growing pigs, with a medium ration of concentrates.

SORGHUM OR CANE

The coarse fibrous nature of sorghum and its low protein and high sugar starch content makes sorghum practically of a very limited usage as a hog forage. It may be used during the early summer season for old sows, when sown thickly to minimize rank growth, but it is

not advisable to pasture in late fall or the second growths, on account of poisoning resulting from frost.

LAMB'S-QUARTERS OR PIGWEED

This is a very common weed usually found growing in very rich soil. It occurs in both narrow and broad leaved species. When secured in the young and succulent stage, it becomes of high value as a forage for hogs. The commonly prevalent "parsley weed" is also relished, and is of excellent value as a hog forage.

ROOTS

The value of the different root crops as a feed for hogs lies largely in the possibility of their abundance and cheapness of production. Their almost total digestibility, bulkage, watery content, laxative effect, provision of variety, relish and winter time succulence are of especial benefit to growing pigs and brood sows.

The feeding of roots in connection with concentrates materially lessens the amount required of the latter, either for a developing or fattening ration. Roots commonly embrace beets, carrots, mangels, rutabagas, Irish and sweet potatoes, turnips, artichokes, cassava and chufa. The feeding of root crops is not advisable in a strictly fattening ration, and in no event should they be made the base of any ration, although hogs may be allowed free access to fields containing these crops, with grains fed additionally.

SUGAR BEETS

Of all root crops, sugar beets are considered to be of the best feeding value and are the most highly relished by the pigs. While their feeding will provide a good maintenance ration, it is not advisable to overfeed or make them basic of the ration. The addition of corn or other

grains, shorts and alfalfa makes a good combination.

The feeding of wet beet pulp produces about the same results as the sugar beet, when properly balanced with concentrates. There exists some doubt as to the advisability of freely feeding the molasses product, as it has a tendency to create scours and other digestive disturbances.

IRISH POTATOES

The undersized, off grade, decaying or wasting potatoes may be economically fed to hogs, especially to young, developing pigs or ailing swine, steamed or cooked and mixed with grains. Potatoes alone are scarcely life-sustaining, especially when fed raw. It takes about 1000 lbs. of potatoes to produce the same gain as will 100 lbs. of corn, and sometimes to accomplish this result, two or three hundred pounds of other concentrates must be given in addition.

SWEET POTATOES, CASSAVA AND CHUFAS

The South is favored with ideal conditions for the production of sweet potatoes, cassava and chufas, slightly different species of root crops very common to these sections. Their value is slightly less than that of Irish potatoes and their protein content is very low, requiring concentrates or forages to give proper balance. Like the artichokes, they are best harvested by giving the pigs free access.

ARTICHOKES

The artichoke is the tuber of a rather tall, broad-leaved, weed-like plant common to the Corn and Hog belt. Artichokes occur in both the domestic and wild state. The domestic artichoke is very productive, yielding from 200 to over 500 bu. per acre, and is well rel-

ished by hogs, and produces economical gains with grain concentrates. Yet artichokes are not very extensively used as a hog food.

Hogs may be best turned into fields of artichokes during the fall and early winter, as they can then handily root out and harvest the crop of tubers. Artichokes add well to the brood sow and growing pig ration, with but one drawback — they give the hogs a tendency to root.

CHAPTER XXXIII

GRAIN, MEAL AND OTHER FEEDS

CORN

CORN is considered as the basis of all hog foods, regardless of many so-called objectionable features, for like any good thing, its use is much abused when fed alone. When corn is well balanced with supplements, trouble is absent. Practically all other hog foods are supplementary to corn. Corn is practically indispensable in any hog ration, and every ration, to give the best of results, should have corn as the base. But corn alone is excessively fattening and heating, and is very deficient in certain proteins that are essential building elements and in the calcium content of mineral matter. Corn is an excellent fattening food, giving a hard, smooth finish, but it lacks ideality as a brood sow or growing pig food. Corn also lacks in fibre or bulky matter, and in the life vitamins found so plentifully in milks.

The excessive feeding of corn, year in and year out, tends materially to diminish size of bone and body frame, decreases the powers of vitality and prolificness and increases the sluggishness of nature, effects a "burned up" condition, and is a primary cause of many prevalent hog ailments and diseases.

The only real harmful trouble of corn is from over-feeding alone, or of feeding immatured, mouldy or soured corn. Corn does not contain any poisonous element. Corn fed in proper balance with supplementary

foods becomes practically free of all objections. Milks, small grains, alfalfas, clover, roughages and pasturage give the best results in balance with corn, and more so when tankage or meat meal is added. It must be remembered that practically all foods lack in some essential that would make them ideal, milk not excepted. The necessity of balancing the feeding of corn with supplementaries is evidenced clearly by the summaries of various experimental stations. They show that it requires about one-third more of feeds and of cost to produce a pound of pork on a corn alone ration than the feeding of a well balanced ration of corn, forages, milk, tankage, etc.

Corn is either hand fed in the ear, shelled or ground, or self fed in feeders, or by the practice of "hogging down" corn, or by the hogs running behind cattle in the feed yards. Any of these methods can be made successful, coupled with proper balances and sanitation.

Corn is sometimes ground in balance with other grains or foods or soaked in a whole, cracked or ground form, and is sometimes steamed or cooked. In soaking, concentrated lye is used by some to correct the acidity or destroy bacteria, thus making it sterile.

Regardless of its preparation or the form of feeding, the essentials of supplementary foods must be — a bulkage to offset the concentrated nature of corn, a high protein and mineral content to offset the corn's lack of it and a good water content to aid in digestion, allay heat and favor laxativeness.

Corn is usually soaked for summer pig feeding, and fed in the dry state to older hogs during the winter months, but contrary to popular practice, developing pigs will do better on dry corn, milk and pasture, and older hogs will do better on soaked corn, forage or pasture.

In common feeding practice, one bushel of corn will produce 8 to 12 lbs. of pork, sometimes 15 lbs., according

to age, frame, nature and purpose of feeding. Old thin sows and big framed hogs make the best gains, while long fed, small boned or well-fleshed hogs make the lowest gains.

In all feedings, regardless of form or preparation, the corn should be seasoned with salt, or the salt free of access to the hogs. It should also be supplemented with foods of high mineral content, or by free access to wood ashes, charcoals, lime, etc.

The kernel of corn comprises six nutrient materials, viz: the hull or outer covering, the horny gluten, the starch, the crown starch, the germ and the tip or cap. The hull contains little or no protein and little ash. The horny gluten contains a good part of the small per cent of protein, and the high starch content fills the crown and walls of the kernel. The germ contains about one-half of the oil of the entire kernel.

Types and breeds of corn differ considerably, but all are excessively starchy and fattening. To remedy this, the selection and breeding of corn that is somewhat low in starch and high in protein content, is advisable, especially for hog raising.

WHEAT, SHORTS AND MIDLINGS

Shorts and middlings are the by-products, along with bran, in the process of making flour. The patented processes of flour making oftentimes lower the value of the by-products, sometimes lowering their wholesomeness, and some millers mix too freely with base or inert materials. Wheat may be fed whole, cracked or ground, preferably in the latter forms, and soaked for at least 12 hours.

Shorts or middlings produced under the old process of milling, that is, containing considerable bran, unbleached and unadulterated, are of high value fed either

dry in self-feeders or in a slop made ration. Usually shorts and middlings lack slightly in the calcium or bone building materials, and have a slightly harmful acidity. Shorts or middling slops properly balanced with milk or tankage make an ideal supplement to corn, especially for little pigs and backward runty shoats.

Shorts and middlings should not be soaked more than 12 hours, as bacterial fermentation usually sets up during warm weather, causing slop to become sour and rancid. The slop barrel should be entirely emptied after each and every feeding, and washed out with a weak solution of lye water or a solution of low form antiseptic, such as lime or cresol dip. Slop should never be allowed to accumulate on either the outside or inside of the barrel, as such accumulations become harboring places for many forms of bacteria or germ life. A little salt or common soda may be used to season and sweeten the slop mixture.

BRAN

Bran is the hull or outer skin of wheat, being very rich in mineral matter and has a laxative effect. Its great bulkage precludes its general use as a balance for fattening rations, but it is nearly ideal as a part of the brood sow ration, from its bone building, milk producing and laxative nature. Bran, from its bulky fibrous nature does not give satisfactory results in pig feeding, nor is it as palatable as shorts, middlings, corn, oil meal or tankage.

OATS

Oats, like wheat, barley and kaffir corn, are oftentimes used as a supplement to corn, but if cheap and abundant, oats can be used as a base hog-food for a short period when properly balanced with other foods to supply the elements in which they are deficient. Oats lack

in protein elements to perfectly balance with corn, but have a sufficiency of mineral elements to offset that deficiency in corn.

The tough, bulky, woody, fibrous shells surrounding the inner grains of oats sometimes effect harm when fed to young pigs, or when older hogs greedily gorge their stomachs full, without proper mastication. To avoid such troubles, oats should either be ground, soaked or fed in combination with other grains.

A mixture consisting of ground oats 1 part and corn 2 parts gives good results with milk and forage, as a developing ration. Oats as a part of the brood sow ration aid in bone and milk production, and are corrective of minor digestive ailments, especially charred or slightly burned oats. The oats of the highest value for feeding purposes are those having light, blunt shaped hulls, with well developed kernels.

BARLEY

Barley is very similar to wheat, rye and oats, in that it may be used as a base, and gives best results when balanced with corn. Barley is slightly higher in protein and mineral matter than corn, with a correspondingly less fattening content. The feeding of barley tends to develop frame and muscle, giving the animal general evenness, but will not produce the high corn finish. Hogs fed on barley and properly supplemented with other foods and pasturage tend to become finished animals, more of the bacon type.

Barley can be fed in the whole grain, but preferably ground or in a soaked state, in order to overcome the objection of the tough woody hulls. Many breeders practice "hogging down" fields of barley, with very desirable results.

EMMER OR SPELTZ

Emmer or speltz is a hybrid grain closely resembling oats and barley and yields very abundantly. Speltz is quite extensively grown in the Northwest and considerably used in fattening and developing hogs. However, it requires nearly 100 lbs. of speltz to produce the same gains as 70 lbs. of corn. Its abundance and cheapness of price make it popular and profitable. Speltz is usually ground, soaked, and fed in connection with other foods and supplements.

COWPEAS AND SOY BEANS

Canadian field peas are quite extensively grown, especially in the northern and western sections of this continent. The protein content of peas with that of soy beans is much higher than that of other farm produced hog foods, and the fat equals or excels them. The common practice of feeding peas is by sowing the fields during the months of May or June, and turning hogs therein during August, or ripening period, allowing the hogs to eat at free will.

Some hog feeders harvest and thresh the peas, feeding them whole or ground into meal, with or without other foods or supplementals. The feeding of Canadian field peas has many features to be recommended, especially its production of big frames and healthy bodies that finish into pork of high bacon quality.

Soy beans are very closely related to Canadian field peas, as the analysis, feeding value, method of culture, feeding and results are practically the same.

PUMPKINS AND SQUASHES

The common field or cow pumpkin is a valuable forage food, especially for brood sows and young pigs during

the fall and winter months. Pumpkins alone will hardly sustain life, but with a third or more corn ration, they give good results of gain and are very helpful, especially the seeds, which act as a vermifuge for intestinal worms. Yet overeating the seed may cause digestive trouble. Pumpkins are best fed by "hogging down" fields of corn, pumpkins and rape or by feeding the raw pumpkins in the brood sow or pig ration. It is neither economical nor best to cook pumpkins.

Squashes are very similar to pumpkins in nature and value, but are not so commonly used for a hog food as are pumpkins.

RICE

In certain sections of the South, hog raisers are favored with the cheapness and abundance of the by-products of rice, and very flattering results are reported on these feeds. It is reported that 100 lbs. of the rice polish product are equal to about 130 lbs. of corn, and that the same amount of rice bran is equal to about 110 lbs. of corn, and that rice meal is about equal with corn, pound for pound. However, it is hardly possible for rice to become as staple as corn, but where it may be secured economically and in abundance its use should be employed.

COTTON-SEED MEAL

Cotton-seed meal is the finely ground product of the mealy inside of the cotton seed. Its protein content, like that of gluten and blood meal, is excessively high, while its carbohydrate is passably good, and its mineral content very high. Its continuous feeding has harmful results, especially to brood sows and young pigs.

While cotton-seed meal may be fed safely in limited amounts for 40 or 60 days, common experience tends to

disapprove of its being extensively used as a staple hog food. Still some southern hog men report securing good results without practically any serious harm.

GLUTEN FEEDS AND MEALS

All products, such as glucose meal, and feed, cream and flour gluten, sugar, starch or maize feed, hominy or corn hearts and other similar by-products from the manufacture of starch and glucose from corn, come under this term. The definition of gluten is a tenacious, viscid constituency as found in flour or meal dough.

These feeds are high in protein and fats, passably high in carbohydrates and very low in mineral matter. They may be fed with other foods in proper balance. For example, corn 4 parts, gluten meal 1 part, or barley, wheat middlings 4 or 5 parts to 1 of gluten, or with 10 per cent oil meal or tankage. In order of value gluten meal precedes hominy hearts and hominy meals.

MILO MAIZE AND KAFFIR CORN

These foods are the seeds of sorghum cane-like plants that are abundantly produced, especially on the semi-arid plains of the South and West. The heads are harvested, threshed and fed either in grain or ground form. In analysis, these two grains are very similar to that of corn, having a slightly less fattening content and a little more of mineral matter. They give good results for fattening, especially when supplemented with other foods and forages, but like other foods of their nature do not give the best of results when fed alone.

MEAT MEAL OR TANKAGE

These valuable concentrates and supplements are of packing house production, being a by-product made from the accumulations of meaty parts and scraps of these

plants. The mass is thoroughly cooked in pressure tanks at a high degree of heat to separate the fats and oils from the tissues and to sterilize the product. Then it is dried under intense heat, ground and screened, to be mixed later with the solid matter secured from the water that the original meats were cooked in. This gives the product its high protein content. The final process of mixing prepares the product for bagging and consumption by hogs.

Standard tankages or meat meal show analysis of at least 60% protein, 8% fat and 5% crude fibre. A lower grade containing not less than 45% protein, 8% fat and 5% crude fibre is also produced. The value of tankage lies mostly in its protein content, hence the 60% protein grade is always advised.

Many hog men claim to find differences of results between different brands of tankages of the same protein content. After considerable experience and research, this cannot be substantiated. Every packing house practically uses the same by-products, employs the same methods of production and is required to conform to the same regulations governing its production and sale, hence the 60% tankage of any reliable packing house should be of the same high quality and productive of as good results as any other brand of the same analysis. True there is some difference in brands of salt, flour and sugar. Tankage should be almost as standard as either of these food products. Some packing concerns formerly did run considerable offal or fertilizing material into this product, but no tankage producer can do this now. Tankage has been condemned more from its misuse and from the results of feeding low grade or 45 per cent material than from any real contained harmful element.

Tankage fed in line with the teaching of extensive experiments practically always gives splendid high results.

Like many other concentrates tankage must not be used as a one-alone ration, nor in excess especially to brood sows, young or developing pigs. Tankage gives best results fed in connection with corn and pasturage to either brood sows, pigs or fattening hogs.

Tankage is very high in mineral matter, especially in the bone forming calcium and phosphorous content, being excelled only by milk, and the alkalinity of its mineral matter aids to sweeten and neutralize digestion. It is also high in certain elements in which corn is deficient that are very essential to the life and growth of all animals.

The fat content of tankage, like that of all animal origin fat, is more easily digested and assimilated than that of vegetable origin, the fats of milk are alone superior in this respect. Tankage is generally conceded to be the most economical and result giving supplement to corn, accessible to the majority of hog feeders, especially for proteins and mineral matter.

Tankage gives the best results fed about 5 to 10 per cent of the ration with corn, wheat middlings, forage, etc. Tankage may be fed profitably to hogs running behind corn fed cattle. Its allowance should be considerably less than when hand fed or self fed with grain rations.

BLOOD MEAL

Blood meal is a packing house product from the blood of cattle which is thoroughly sterilized and steamed, dried and ground into a meal. Blood meal is exceptionally high in protein, but is very low in mineral matter and fat, being less than one per cent of the latter, besides containing six or seven per cent of moisture.

The feeding value of blood meal has not been fully determined. It is high in protein and relished by pigs

when mixed with wheat middlings, and has some corrective value with pregnant sows. The use of blood meals had best be of a very limited nature. The better plan is to place more dependence on milks and tankage.

BONE MEAL

Bone meal is a packing house by-product produced by sterilizing animal bones and grinding them into a fine meal. As bone meal is high in calcium and phosphoric elements, it is an excellent bone building supplement when fed in limited amounts, especially to young, developing pigs. Bone meal from point of cost and economical results, ranks next to both sow's and cow's milk as a bone building agency.

LINSEED OIL MEAL

Oil meal is a by-product in the production of linseed oil from flaxseed, being ground into meal form. Oil meal should never be fed excessively to the breeding herd, as it is liable to cause abortion of brood sows when overfed. The high protein content and laxative nature makes it a valuable supplement to nearly all rations when used as a small per cent of the rations.

Oil meal produces laxativeness and adds temporary palatability to foods, giving a heavier creamy body to slop mixtures. Like most of the concentrates, the harm produced is generally caused by its misuse, and the greatest benefits are derived by feeding in perfect balance with other foods. A little oil meal, not to exceed 5%, is recommended in the rations of brood sows and developing pigs, not of continuous feeding, but more as a condiment or for medicinal use.

Oil meal may be added to a mixed grain or alfalfa hay and grain combined rations, or it may be fed in com-

binations with tankage. However, these two products are practically the same analysis, tankage being the better. It is advisable to use only one to secure the needed protein elements. From 10 to 20% of oil meal gives excellent results in fattening rations, especially dry lot feeding.

“ HOGGING DOWN ” FIELDS OF PUMPKINS, RAPE AND CORN

The generally high results secured from “hogging down” methods establishes the advisability of their general adoption wherever practical, especially from the hygienic standpoint, as it gives the hog a more primitive life, a wider range, cleaner environments, minimizes infections, stimulates appetite, aids digestion, assimilation and elimination, provides sufficient exercise and gives a better balance of rations. Most hog farms can be arranged to adopt this system of feeding, especially during the fall and early winter months. “Hogging down” also saves labor, time and expense and materially increases swine production. Again, of all farm animals the hog is best equipped to profitably harvest crops in this manner.

To hog-down successfully, the whole farm or its fields should be fenced hog tight, and a 5-year rotation cropping system arranged, of corn, clover, alfalfa, timothy, rye and oats. The fields intended for the basic food use are planted first with corn, later with pumpkins, and either preceding or following the last cultivation, they may be sown with Dwarf Essex rape. When the corn commences to mature, a woven wire fencing is stretched through the field so as to enclose only a small area at a time. Not more than 5 or 10 acres should be allowed for 100 or more hogs. This provides a more thorough clean-up of the combined feeds, and a much cleaner and more wholesome nature of the foods consumed.

Spring pigs are commonly used to "hog down" corn. It is figured that 50 pigs weighing 50 to 125 pounds each will clean up one acre of corn yielding about 50 bushels of corn in 6 or 8 days.

As in other methods of feeding, it is better to underallow the amount consumed than to overallow, and to gradually place the hogs on a full range of farm and feed than to cause a too sudden change in the nature or amount of feed. In the beginning, it is best to allow hogs access to the field only a few hours daily, after being fed first a fair ration of concentrated foods. For example, dry lot hogs should not be turned into green fields of corn or pasturage direct, nor should pasture fed hogs be allowed to gorge on corn. Most hogs should be turned gradually into fields of corn, pumpkins or rape, but hogs that are accustomed to good clover or alfalfa pasturage can be allowed a greater freedom. A full access to range should never be given before 30 days, and even then the hogs should be supplied with foods analyzing high in mineral ash and alkaline content, as oats, oil meal, tankage, ashes, salt, etc., along with free access to fields of clover or alfalfa, timothy or blue grass, and plenty of pure water.

It is believed that this practice of feeding, coupled with good sanitation, helps to control and minimize the prevalence of many common and fatal ailments and diseases occurring during the fall months, especially hog cholera. This practice also furnishes succulent forage in abundance, to take the place of fall pasturage that is usually short and dry from adverse weather conditions, and it also causes a wide distribution of manure over the farm.

The advised, practical system of forage crop rotation is approximately as follows:

The first year field, planted in corn, pumpkins or rape.

The second year field, planted either corn or oats, and sown in fall with rye.

The third year field, rye with clover, and timothy sown in early spring.

The fourth year field, timothy and clover through all seasons.

The fifth year field can be left to timothy and clover or plowed up for corn or for small grains, after which alfalfa may be sown in either spring or fall, to be cropped for 7 to 10 years.

MILK

Milk is secreted from the blood through certain functions performed by the mammillary glands, which are soft, spongy organs filled with a fine network of ducts and cells, which connect with the circulatory system and certain organs of the animal. The formation of milk is not altogether continuous, for the greater part is formed just prior to the suckling of the pig, hence ideal natural conditions induce the highest flow of milk.

Milk is the basic animal food, as it contains a complete ration for development and growth consisting of fats, sugar, protein, casein, albumen, ash or mineral matter and water. The fats occur in small globules of size about six thousand to the inch. The casein and albumen represents the nitrogenous. The milk sugar represents the carbohydrate, the ash or mineral matter coupled with the nitrogenous contributes most for the growth and development of bone tissue and body. The fat of milk is of too high value for pig feeding.

The bacteria that are the specific causes of tuberculosis, fevers, cholera, etc., may be carried and transmitted by milk. By pasteurization or heating to 212 degrees for a few minutes, or by the use of boric acid or salicylic acid, the growth or presence of bacteria may be minimized.

THE VALUE OF MILKS

The milk of the mother sow may be termed as the fundamental pig feed, with the milk of the cow supplemental to it. The sow's milk is much richer in nutrient elements than that of cows. This milk is intended by nature to furnish all of the food nutrients needed by the pig until several weeks of age. Very rich in the beginning it gradually diminishes as the pig ages. Nature finally effects complete discontinuance of the dam's milk by causing the flow to diminish in both quantity and richness, until the pigs are forced to acquire appetites and ability to handle other foods, which eventually cause the pigs to curtail dependency upon their dam's milk, and evolves the best way to effect perfect weaning of the pigs.

The quality and quantity of all milks is of vital importance. All milk producing animals should be fed pure and wholesome foods, and kept in sanitary quarters. They should be free of any constitutional ailments, such as tuberculosis, blood disorders, etc. Such ideality coupled with the feeding of rations properly balanced to produce milk high in the growing and building elements, goes far to produce healthy and thrifty pigs.

Pure cow's milk may substitute that of the sow's for "orphan pigs," if it be fresh from the udder, slightly sweetened with sugar and a little lime water added, given a little at a time, and often, but never overfeeding. Cow's milk in any form is one of the best supplementals for growing pigs and for convalescent hogs. Cow's milk in the process of digestion forms a curdled mass in the stomach, so it should not be fed in excessive amounts, or in too sour or rancid states. Separator milk, fresh from the machine, seems to give the best and least harmful results.

Of all milks buttermilk contains the least nutritive

elements and the most of the harmful ones for pigs, especially when fed in excess. The processes practiced by many dairies and creameries in extracting the butter fats, etc., cause the buttermilk to be laden with many harmful, chemical ingredients, and as the milk is gathered from over a vast territory it is also liable to contain germs of tuberculosis. Then again its state may be rancid or putrid, from being placed or kept in foul and unsanitary containers. However, wholesome buttermilk, fresh or in a sterilized or dried form, becomes a most recommendable, economical and profitable supplementary hog food, especially for growing pigs or those suffering from intestinal ailments, supplying lactic acid to stimulate and aid digestion.

The high albuminous bone, blood, nerve building content of all milk makes it of very high value and importance, vitally so for young pigs, especially during their growing and developing period; it is also an appetizer, balancer and supplement to all grain rations.

The analysis of cow's milk taken on an average shows approximately: protein 3.50, fat 3.80, sugar 4.80, ash or mineral matter .75, water 87.00. This shows sow's milk to be much richer than cow's milk, especially in protein, fat and mineral elements.

The analysis of buttermilk varies greatly, averaging about a 10% total of dry matter, which represents its protein, fats, sugar and mineral matter content.

The analysis of sow's milk immediately after farrowing, shows extreme richness in protein and fat elements. Technically speaking, the sow's milk at this period is called colostrum, from its richness and life building, laxative, regulative effects, being in fact the life fluid full of the essential vitamins, the connective link between the dam and her litter, which are transforming from the foetal to living, breathing, suckling

baby pigs. It also starts the action of digestion in young pigs. Conforming to nature, the quality and analysis of the sow's milk changes and lessens in richness, but slightly increases in volume for a few weeks, then lessens in both richness and volume until the weaning or drying up period effects total cessation of the flow.

In computing of rations, normal sow's milk may be considered as Nature's own balanced pig ration, one very difficult to substitute with any other "man made" pig ration. Tankage becomes secondary to milks in value and effects for pigs. The feeding value of skimmed milk compared with corn is about 500 to 600 lbs., against 100 lbs. of corn.

CHAPTER XXXIV

HOG FEEDING AND BODY BUILDING

THE nature of the feeding of hogs is one of the most essential factors in successful hog raising. In order to feed and develop pigs properly the feeder should become fairly conversant with the nutrient values and effects of all hog feeds, so that he may be able to forecast the result of most any outlined balance of rations or method of feeding.

It is not necessary to acquire great technical knowledge of food analysis and feeding standards. The hog feeder should learn mainly practical facts, such as the composition of foodstuffs, what each element will produce in the form of pork, its upbuilding or down-building effects, also the effect upon the hog's general health, growth, physical conformation, stamina, vitality and prepotency, and finally, of the probable ultimate ending and profit, whether it be for the feeding of pigs, breeding animals or of hogs for the market. These are the essentials, and to get at this from a practical view, a study should be made of the elements that largely compose the carcass of the hog.

Both plants and animals are only able to nourish and develop their body structure to its highest state when there is an abundance of building or nutrient material available. For example: the *big stalk* of corn in rich soil, with its many broad leaves, is enabled to mature from one to three ears of corn, while the *puny stalk*

in poor soil may not even have a "nubbin," and the big stretchy, motherly sow that is well fed usually raises a big healthy litter of pigs that finish into market toppers, while the "runted" and wrongfully fed and kept sow may only farrow weak litters or twins that may or may not reach the market.

The feeding of hogs is based upon the best methods of building their bodies into finished pork products, and in order to correctly do so many factors must be considered; the requirements for maintenance of life and for the performance of life's essential functions by the animal, the digestibility and the real nutritive value or use of the food by the animal, the net value of the food after the maintenance requirement and losses by undigested matter in the feces and by the formation of gases during digestion, and the waste carried out by the urine. All combined tend to show that perhaps not more than one-half of the common hog foods are really available and utilized in building up the body and fattening the animal.

The energy or fuel value of foods is measured by the amount of energy they will furnish by burning, the same as coal, wood or fuel is tested. This power is expressed by calories. This does not always represent the true nutritive value of a food, as the difference in character and composition of foods, their digestibility and varying losses during digestion and assimilation present many different percentages of net energy values.

Pork is not made from any one food element or ration, but from a combination of them. The best pork is secured by the feeding of a well balanced ration composed of nearly all the farm produced hog feeds, the milks, grasses and grains. Nature's plan, or the "free choice system," sometimes called the "cafeteria plan," is a successful and natural feeding system, as is also the practice of allowing fattening hogs to run behind cattle

that are being fed on a well balanced ration, with the addition of concentrated feeds, such as tankage, and with pasturage in addition, if possible.

The analysis of the hog's body shows the following elements, approximately: water 50%, protein 15%, fat 30%, ash or mineral matter 2 or 3%. These proportions vary somewhat according to type, breed, condition and nature of the feeding of the animal. Hogs that are in lean or breeding condition run higher in water and protein, while those that are excessively fat or are of the extreme small boned type, run lower in ash and minerals.

Hogs of the so-called "Big Type" have higher amounts of ash or mineral matter, and generally a lower per cent of fats. All hog feeders eventually find out that the desired types are largely built up and maintained by the feeding of favorable foodstuffs, also that the main dependence must be placed upon farm produced foods as basic of all hog feeding operations, not alone from their abundance, accessibility or cheapness, but for innumerable other reasons. Also that no single farm produced or commercial food will supply a complete balanced ration, hence it becomes necessary to supplement practically every commonly used concentrate hog food. Experience establishes the prevailing grain hog foods in order of value and usage to be, as follows: corn, wheat, barley, oats, rye, kaffir corn, milo-maize and sorghum seed; but no one should be fed alone, the better system being to combine one or more with roughages or pasturage. For example, experimental feeding has established that it takes about 475 lbs. of corn to produce 100 lbs. of pork, and that 470 lbs. of wheat or 465 lbs. of barley will produce the same result. But when the above three foods are combined in equal parts, 100 lbs. of pork can be produced for every

450 lbs. of grains fed. Still better gains and results are secured when the combined ration is further supplemented with skim-milk, alfalfa, clover, pasturage, meat meals or tankage. In fact, a wider diversity of food-stuffs tends to effect a better natural balance of rations by the hog itself, also a cheaper cost of production. Hence, successful pork production lies largely in the arranging and taking all possible advantage of all known laws of nature and experiences in producing, supplying and feeding foods to hogs, in conformity to reproduce the highest type and quality.

The different essential factors governing body building given in the approximate order of importance are:

WATER. Water is the most important element of the hog's ration. Animals cannot live long without water, and its deprivation always produces harmful results. Its purity, accessibility and approximate quantity consumed daily should be of personal knowledge. Hogs cannot properly digest, assimilate and eliminate their food-stuffs unless they have the natural required amounts of water, in combination with their foodstuffs. Water also flushes out the intestines and enters into and becomes the greater part of the blood and body structure. Water is absorbed freely into the system all along from the stomach to the large intestines.

PROTEIN. This element contributes largely to the building of the muscles, tissues, brains, nerves and vital parts, organs, the blood and lacteal secretions, and also forms bones, cartilage, skin, hair and hoofs of the hog. Foods that are relatively high in protein are conducive to the production of strong, healthy, vigorous and prepotent hogs. Protein, coupled with the mineral ash element, may be termed as the health, life and body building elements of all animal foodstuffs. Yet, the excessive feeding of proteins will cause harmful effects.

FATS. The fats of foods are converted into oils and fats as found in the body by the process of digestion and assimilation, which prepares them for absorption. The fat splitting element lipase changes the form into emulsified, soapy, fatty acids and glycerin, with the aid of the alkaline cell of the bile.

CARBOHYDRATE. Plainly speaking, this is the sugar and starch content, in combination with carbon and water, of foodstuffs. This element is closely coupled with fats proper and it produces certain forms of fats in the body of the hog, that become as storehouses of heat and energy, enabling the animal to move about, preserving an even temperature of body and a reserve of life sustaining elements to draw upon during sicknesses or deprivations. While most grains, excepting corn, contain a low percentage of heating and fattening content and fat formers, most feeds contain a high per cent of carbohydrates. This fact generally compels the balancing with grain of foods that are more pronounced in protein, as alfalfa, tankage, etc., so that the hog may receive an ideal developing and building ration. Otherwise, when the hog is to be fattened for market, the ration should be overbalanced in carbohydrates and fat formers, such as corn. The carbohydrates are absorbed in the form of glycogen, or more plainly speaking, animal starch. The glucose-like sugars formed in the intestines are absorbed through the intestinal walls and carried by the way of the portal vein to the liver, where they are stored temporarily as glycogen, which gradually changes back into glucose and enters the blood circulation to be carried eventually to all needed places of the body.

MINERAL MATTER. The ash or mineral content of the hog's body is determined by the reduction of the body by fire. The bone structure contains almost the entire

amount of the limes, phosphates, and inorganic salts of the entire carcass. Alfalfa, milks, wheat, oats, grasses, meat and bone meal, oil meal, wood ashes, vegetable ashes and tankage are the best builders of bone and ash. In computing all balances of feeding rations for hogs, the analysis of such foods should be closely studied and reckoned, as they may differ according to the nature of the soils on which they are produced, or by the process of making. Soils can only give to plant life grown upon them a combination of the mineral element that they contain. For example, soils deficient in limes produce alfalfa or clovers deficient in the same elements. Many supplementary foods used to supply protein and ash elements are relatively low in these basic ingredients. However, the protein and ash of most supplementary feeds are readily and almost wholly assimilated and utilized. Separator milk is one of the most valuable and economical supplementary hog foods that can be obtained. Alfalfa is next in value, cost and availability.

Farm produced foods, alfalfa, clovers, grasses, peas, beans, rape, milks, pumpkins, etc., can supply protein and mineral at the lowest cost. In commercial foods, dependence is placed upon meat meals, tankage, oil meals, shorts, brans, etc.

The number of pounds of nitrogen and mineral ash elements in every 1000 pounds of pigs is given in the following table:

	Phosphoric Acid	Potash	Lime	Magnesia	Nitrogen
Fat Pig . . .	16.54	1.38	6.36	0.32	17.65
Stock Pig .	10.66	1.96	10.79	0.53	22.08

Iron, silica and soda are also found in small amounts. Mineral matter is absorbed in the small intestines in a practically unchanged form. The hydrochloric acid of the gastric juices causes mineral matter to become soluble.

By the comparative study of the life and growth of both plant and animal life, especially of their similar essentials, the life protoplasts, mineral elements, fats, carbohydrates, proteins, water, air, etc., and of their connective dependency one upon the other, the cycle of life transformation from plant to animal, animal to earth and earth to plant becomes fixed and definite of mind, proving the old adage, "Dust thou art, to dust returneth," and that foods fed to both animal and plant life must be of the highest ideality in order to perpetuate and produce the highest types, quality and power.

THE TROUBLE WITH SINGLE RATIONS

No food should be fed exclusively, nor too high in balance for any extended period. The ration should be near ideal for the purpose fed, to bring about an even growth, development of body and a well-boned animal, capable of carrying the full amount or load of fats without harm to its breeding functions. For instance, the trouble with the corn-alone ration is its lack of protein element, very low mineral content, low quality of its protein, excessive heat and fat, and the acid nature of its ash content. Its excess of carbohydrates and lack of protein is markedly shown by its analysis, which gives nearly eight pounds of carbohydrates for every pound of protein content, or about twice the proper proportion.

Young pigs should have only one pound of protein for every four pounds of carbohydrate, or roughly speaking, the feed ration should be about 20% of protein elements. Furthermore, the protein element of corn lacks in certain body-building elements that promote growth, thrift and good health. The entire absence of these elements in the ration will eventually produce a low state of vitality, growth and thrift, followed later by death.

The extreme low mineral content of corn practically

precludes the hog from receiving the required amount of calcium (or lime), the bone-building material of foods, which comprises about 40% of the dried bone ash of animal life. This is also true of the other necessary elements, such as phosphorus, magnesia, potassium, sodium, sulphur and chloride. The nature of the mineral ash content of corn is also of a harmful acidity which interferes with the digestion and assimilation of protein. Corn also contains more fat than that required for a developing ration. The hog men of long ago recognized this fact by sweetening the acidity of corn by soaking the corn in a light solution of lye-water, and by the liberal feeding of wood ashes and a little salt.

To effect a well balanced ration with corn as the basis, the supplements added should have as few pounds of carbohydrates to the pounds of protein as possible, and the protein of these foods should be of the highest quality. A wider variety of supplement feeds tends to insure a greater abundance, a better balance and mixture of the life and body-building elements. It is generally believed that the proteins of animal origin give better results than vegetable derived proteins. For example, the milk of both the mother sow and cows, meat meal, or tankage products are generally accepted as the basic protein supplements. Furthermore, the other basic factors of a "well-balanced result-getting ration" are its proper balance of fat and mineral content, together with its palatability, digestibility, assimilative value and purity of nature. The supplemental foods should also possess an abundance of mineral nutrients, especially of calcium, phosphorus, phosphates and potassium. The nature and mixture of foods should be such as to enhance palatability, that the peculiar liking of the hog's appetite may be catered to, in any balance or method of feeding. Regular feedings of clean, well-balanced rations without abrupt

changes of nature or amount tend to increase the palatability and final results.

DIGESTIBILITY AND ASSIMILATION OF FOODS

Contrary to many feeders' opinions, the hog does not digest or assimilate 100% of the food consumed. The ratio of digestibility of foods differs according to the elements of the feeds, the state of the animal's condition, form fed and its nature. Averagely speaking, the hog under favorable conditions will digest 80% to 90% of the food consumed, but he does not usually utilize over 50% of it for growth or fattening purposes.

The amount of nutrient material secured by assimilation depends largely upon the balance of the ration fed, the health condition of the animal and natural working of the whole digestive tract. To secure the highest results, there must be thorough mastication of the food, thorough mixing with the saliva of the mouth glands and with the gastric juices of the stomach, and a proper balance of mixtures existing in the stomach of the inorganic acids and base forming elements.

To explain more fully, all feeds contain ash or mineral elements, secured from the soil where grown. The process of digestion being really but a burning up one, these ashes, or inorganic elements, essentially become of great value, especially in the service performed of aiding digestion, assimilation and the building up of the different parts of the animal's body.

In the digestion and assimilation of foods, to secure the best of results, with the minimum of digestive elements or disturbances, the balance between these elements should never be wide apart. The acid-formers should never predominate for any period, or amount, over the basic. In separating the mineral elements into classes, phosphorus, chlorine and sulphur are recognized as the

main acid-forming elements of high protein content feeds, while potassium, calcium, magnesia and sodium are the main basic elements. All foods contain these elements in widely varying amounts, and when taken into the stomach they become the acids and bases of digestion, neutralizing each against the other, attempting to produce the natural digestion of the foods.

To effect more natural and higher degree of digestion and assimilation, the bases should be in excess of the acidity. Should the acidity be in excess for any length of period, unnatural conditions are resultant, which will eventually terminate in serious digestive ailment or disease. There must always be a sufficient alkalinity or basic in the stomach to offset the acidity.

Milks and meat meal products are almost wholly digestible, but the woody fibers, husks and hulls of grains, grasses and vegetation are practically indigestible. While the latter feeds give a greater bulkage and sometimes aid in a certain way, the overfeeding with such foods usually causes the pig to expend and waste considerable energy and digestive juices, in attempting to digest them.

However, the ration should never be too concentrated. Hogs should be supplied with a sufficient amount of bulkages in their feeds to insure an even intestinal load and a laxativeness thereof. Corn alone is too constipating, as are many other high fattening-content foods. The free access to green forages, such as alfalfa, clovers, grasses, and feeding of milks, meat meal, tankage, oil meal, alfalfa and clover hay in connection with concentrates, adds value to and effects a better bulkage, digestibility and laxativeness, besides a better mineral and protein benefit.

Foods that are high in protein content contain larger amounts of acid-forming elements, phosphorus, sulphur

and chlorine. All such foods that do not have an accompanying relatively high base-forming element, should be balanced with foods or elements containing the required basic elements. Thus, foods excessive in protein or muscle-building elements should not be fed exclusively for any long period.

The blood supply and its condition largely affects the state of digestion and assimilation. The gastric juices of the stomach and the assimilation fluids of the intestines are but a part of, or rather a specially prepared form of, the blood to carry on these processes; in fact, the blood becomes as a liquid flesh, or the vehicle and repository of all elements of the body, its office and agency being to carry and control the building up of all parts of the body and eliminate waste matter. Consequently the blood supply should be plentiful and pure, thereby causing a generous building of bone, muscle and tissue in harmony with natural digestion, assimilation and elimination.

SLOPPING HOGS

The results secured by both experiment and common practice do not strongly recommend the practice of slopping hogs above that of dry feeding, especially when the hogs have free access to plenty of good water.

While the soaking of mill feeds and of some hard dry grains for a few hours adds to their palatability and digestibility, prevents a slight wastage of feed and effects a trifle better appearance and slickness of coat of the hog — dry feeding, on the other hand, with ideal forage in connection usually produces a greater poundage of gains and with less digestive ailments, and with a little tankage or milk, in addition, the slick appearance is also secured.

While it may be practical to slop young pigs and brood

sows, certain limitations exist. The continued practice in close, dry pens establishes a weaker boned, smaller sized, more compact, quicker maturing and less prolific type of hogs. Also a backward tendency of all lard breeds to the small type. Where the hog raiser is in a position to give considerable time and desires to give the pigs or sows an extra opportunity to do their utmost during their developing period, it is advisable to give them slop rations, but not without corn and plenty of water, besides a free access to salt and ashes and forage if possible. Slop will not take the place of these essentials, neither will the soaking of any food add to its nutritive value. Again, where the hog raiser desires to utilize such wastage products as kitchen slop, milks, non-grading grains, etc., these may be fed as slops, preferably mixed with a good grade of middlings.

In any event, all utensils used for the soaking of feeds or slopping hogs must be kept sanitary. The foods should never be soaked to exceed twenty-four hours, better only twelve. They should never become soured or rancid nor should any accumulations form either on, in, or outside, as such become harbors for germs. Neither should flies or rodents be allowed access to foods, either in dry or wet state. Contrary to common belief, the acidity of slightly soured foods, and the decay of leftover foods in troughs are not beneficial, but are of harm to all hogs. The slopping and soaking practices require considerable attention to disinfection of all receptacles and utensils. A teaspoonful of lye or a teacup full of soda or an ounce of cresol dip to the barrel once a week will aid sanitation.

SELF-FEEDING

The nature of foodstuffs, their balance or analysis in nutritive elements, method of feeding and sanitation

practiced, have great bearing upon the hog's healthy development and thrift, creation of high power disease resistance, and ultimate maturity, either as breeding animals or market hogs, with the desired attending utility and profit. Hogs, fed and cared for properly, should possess enough natural powers of resistance to throw off many lesser or common ailments, and to weather through the lighter sieges of such diseases as cholera, pneumonia, etc., much better than those of lower vitalities.

Hogs require daily a sufficient quantity of cardinal body-building elements, or vitamins, as found in all foodstuffs, in the proteins or muscle tissue building elements, the oils and fats that furnish heat and energy, together with the carbohydrates or the starches and sugars, and water and mineral ash elements of foodstuffs.

The hog can only assimilate and store up sufficient of these essentials for the body's present needs, with but a small surplus for future purposes, which consists mostly of fats. After the maximum has been secured, the greater part of any nutritive element contained in consumed foods will be eliminated without being properly digested or assimilated. A "high factor of waste" is often established by overfeeding. Its continued practice will cause digestive troubles and make the hog more susceptible to the invasion of disease germs.

For example, the continuous feeding to extremely young pigs of one balanced ration, especially of a fattening, heating nature as corn, causes their organs to become badly overworked in the attempt to consume, digest and assimilate over amounts of such feed to secure the necessary proteids and mineral elements. The ultimate result is a hog of extreme fat, weak vitality, with the tissues of the body fat, soft and flabby, being simply "burned up"

on corn and made very susceptible to the infection and ravages of prevalent swine ailments and diseases.

A well founded theory of hog cholera is that its origin and perpetuation are based largely upon its being of a dietary cause, and that its control and final eradication will be brought about by studying and adopting systems of feeding and care that are best to build up hogs of high vitalities and powers of disease resistance.

Hence, the importance of balancing the rations of the hog, from the embryo pig, through the brood sow, to ultimate maturity. It has long been known that the pig will, when its foods are of free access and provided with free range generally, choose its needful nutrients more properly than when hand fed and close penned.

Hogs of the big or medium types are better adapted to self-feeding than are the small types. Pigs of the latter type are of habit to eat a one-sided ration, lay around the feeder and take but little exercise; consequently they get "off feed" and develop into short, fat, chubby hogs. The big, well bred, good boned, strong vitality pigs eat a well balanced ration, take plenty of exercise and develop into big, smooth, high quality hogs.

These facts being ever present in swine production, cause hog men to study and to adopt self-feeding upon their hog farms so far as practicable, that they may secure desired results of better, healthier, stronger hogs, of stronger disease resistance and ultimate greater numbers, weight and profit.

CHAPTER XXXV

THE GRINDING, SOAKING AND COOKING OF HOG FEEDS

GRINDING

THE grinding of any grain or feed alone does not increase its nutritive value or produce much benefit or profit, but the grinding of old hard grains will make them more palatable and easier of digestion. Further, the grinding of certain grains or feeds in combination to effect a properly balanced ration for hog feeding is both practical and beneficial; for example, the chopping or grinding of alfalfa mixed with corn, wheat, oats, etc., or the grinding and mixing of corn, oats, wheat or barley, oil meal or tankage. One serious drawback to ground foods is that greedy hogs may bolt much of their food unchewed or poorly masticated. This practice may set up digestive troubles and the building of soft bones and muscles.

Whether feeds should be ground depends largely on the nature of the foods, the age of the animal, the manner and purpose of feeding, available help, time, expense and grinding outfit; also of the hog's temperament, habits and greediness,—for instance: hogs fed in large bunches and of uneven size usually practice the “grab and bolt down style,” the older and stronger ones securing the greater part of the food, while hogs fed in smaller bunches, being of about the same age and size consume more even amounts of foods and also form better habits of chewing and mastication.

The grinding of grains also causes a slight increase in the digestibility and assimilation of most grain hog foods and slightly lessens the factor of waste, but unless there exists a good reason, and the cost of the grinding is low, grinding will hardly pay for the additional cost, trouble and labor.

SOAKING

The practice of soaking grains, meals and feeds is recommended for grains that are hard or slow of digestion. The soaking period should be about 12 hours, never to exceed 24 hours. The soaking will often soften the food, especially its cellular structure, causing it to be more palatable, easier masticated, digested and assimilated.

Soaking also lessens the liability of gorging and increases the bulkage and water content of rations. This practice is recommended for hogs running in dry lots, for brood sows and growing pigs. The summertime feeding presents better advantages for this practice than does the wintertime, although the soaking of feeds for brood sows and fall pigs is very profitable during the wintertime. However, spring pigs running on forage will do better on dry concentrates in combination with milk, ashes and salt.

In soaking feeds the barrels, tanks and pails used must be kept sweet and clean, and frequently disinfected. A good practice is to throw in a handful of common baking soda or a teaspoonful of concentrated lye at least once a week in the wintertime, oftener during the summer. This will also improve the wholesomeness of grain foods and destroy low forms of germ life. The change from dry to soaked feeds acts as an appetizer, but this should be gradual, never absolutely direct.

COOKING

Many years of experiment does not find any great advantage in cooking feeds for hogs, except for pigs and hogs that are runted, unthrifty or sick, or in using unwholesome foods, such as garbage or fermenting feeds, by sterilizing them. Corn, oats, wheat, potatoes and vegetables cooked for ailing hogs tend to stimulate the appetite and are more easily digested and assimilated. The practice of steaming or slightly cooking or warming such feeds or combinations as alfalfa, wheat, oats, corn, etc., for brood sows and growing pigs during the wintertime, is oftentimes beneficial, but it rarely pays for the whole herd. The continued practice of cooking foods causes weak, spongy bones and lessened vitality.

Experiments tend to prove that the more natural the temperatures of hog foods, better results will follow; hence it is advisable to slightly warm or steam foods in the wintertime for brood sows and developing pigs to secure summertime temperatures, but in any event, it is not advisable to make radical changes in the temperatures or nature of hog foods.

The following table based on experiments made by the Iowa State Experiment Station gives an analysis of the common farm produced foods and commercial supplements to grain rations. It gives the representative average of feed constituents in a hundred pounds.

Feeding Material	Water	Protein (crude)	Carbohydrates N. F. Extract Fibre	Fat (Either Extract)	Carbohydrate Equivalent ¹	Mineral Matter	Pounds of Carbohydrate Equivalent for Every Pound of Protein
Tankage or meat meal, 60% protein grade	7.0	61.0	7.0	10.0	29.0	15.0	.48
Skim Milk	90.5	3.6	5.1	0.1	5.3	0.8	1.47
Buttermilk	90.4	3.6	5.0	0.2	5.4	0.8	1.50
Linseed Oil Meal (old process) ..	10.0	33.0	35.0	7.0	59.4	6.0	1.80
Soy Bean Meal ..	10.0	33.0	35.0	17.0	72.4	5.0	2.19
Middlings, wheat	12.3	15.5	63.0	5.1	74.2	4.1	4.79
Bran, wheat	12.0	16.0	62.2	4.0	71.0	5.8	4.44
Blood Meal	7.0	87.9	2.3	.50	3.4	2.3	.05
Oats	12.0	11.5	68.0	5.0	79.0	3.5	6.87
Alfalfa Hay	13.0	15.0	63.0	2.0	67.4	7.0	4.49
Clover Hay	13.0	12.0	64.5	3.5	72.2	7.0	6.02
Gluten Meal	8.0	41.0	47.5	2.0	51.9	1.5	1.27
Peas, Canadian field	14.0	24.0	58.5	1.0	60.7	2.5	2.53
Cotton Seed Meal	8.0	41.0	38.0	8.0	56.6	5.0	1.38

SOME FARM GRAINS NEEDING SUPPLEMENT

Corn (maize) ..	14.0	10.2	70.0	4.3	79.5	1.5	7.79
Barley	12.0	11.5	72.0	2.0	76.4	2.5	6.64
Wheat	11.3	11.9	73.0	2.0	77.4	1.8	6.50
Rye	11.8	11.4	73.0	1.8	77.0	2.0	6.75
Sorghum Seed ...	13.0	9.3	72.0	3.7	81.1	2.0	8.72
Kaffir Corn	12.0	10.0	73.2	3.2	80.2	1.6	8.02
Milo Maize	12.0	10.2	72.8	3.0	79.4	2.0	7.78

¹ The carbohydrate equivalent equals the carbohydrates, plus 2.25 times the fats, the fats being considered 2.25 times as effective as the carbohydrates.

CHAPTER XXXVI

SUCCESSFUL RATIONS FOR DRY LOT FEEDING

RECOMMENDED BY PROF. JOHN M. EVVARD

Growing and Fattening Hogs

For Suckling Pigs weighing up to 40 Lbs. All feed being figured on the poundage basis.

USE ANY ONE OF THESE RATIONS.	}	<i>Ration A.</i> Corn 80; Tankage 20; Salt free access.
		<i>Ration B.</i> Corn 75; Middlings 20; Tankage 15; Salt free access.
		<i>Ration C.</i> Corn self fed; Tankage self fed; Salt free access.
		<i>Ration D.</i> Corn self fed; Tankage self fed; Salt free access. Middlings self fed.

For Weanling Pigs 30 to 100 Lbs.

USE ANY ONE OF THESE RATIONS.	}	<i>Ration A.</i> Corn 80; Tankage 15 to 20; Salt free access.
		<i>Ration B.</i> Corn 75 to 80; Tankage 10 to 15; Middlings 10; Salt free access.
		<i>Ration C.</i> Corn self fed; Tankage self fed; Salt free access.
		<i>Ration D.</i> Corn self fed; Tankage self fed; Middlings self fed; Salt free access.

For Shoats from 100 to 175 Lbs.

USE ANY ONE OF THESE RATIONS.	}	<i>Ration A.</i> Corn 80 to 85; Tankage 10 to 15; Salt free access.
		<i>Ration B.</i> Corn 75 to 80; Tankage 10; Middlings 10 to 15; Salt free access.
		<i>Ration C.</i> Corn self fed; Tankage self fed; Salt free access.
		<i>Ration D.</i> Corn self fed; Tankage self fed; Middlings self fed; Salt free access.

For Hogs from 175 to 250 Lbs.

USE EITHER OF THESE RATIONS.	}	<i>Ration A.</i> Corn 92 to 96; Tankage 4 to 8; Salt free access.
		<i>Ration B.</i> Corn self fed; Tankage self fed; Salt free access.

For Fat Hogs from 250 to 350 Lbs.

USE EITHER OF THESE RATIONS.	}	<i>Ration A.</i> Corn 95 to 99; Tankage 1 to 5; Salt free access.
		<i>Ration B.</i> Corn self fed; Tankage self fed; Salt free access.

For Fattening Yearling Sows that have Weaned Their Pigs.

When in poor condition.

Ration A. Corn 90; Tankage 10; free access to Salt and Charcoal or all self-fed.

When in good condition.

Ration B. Corn 92 to 95; Tankage 5 to 8; free access to Salt and Charcoal or all self-fed.

Omitting tankage of all rations the last two or three weeks.

For Fattening Two Year or Older Sows that have Weaned Their Pigs.

When in poor condition.

Ration A. Corn 95; Tankage 5; Salt free access, or all self-fed.

When in good condition.

Ration B. Corn self fed or all they will eat, with free access to Salt.

For Pregnant Breeding Sows.

At breeding time; Flushing to increase the number in litter. Start at least 10 days before breeding.

For Gilts.

Ration A. Corn self fed; Tankage self fed; free access to Salt.

For Older Sows.

Ration B. Corn self fed; Tankage self fed; free access to Salt.

Or Corn 90; Tankage 10; free access to Salt.

During the Gestation or Pregnancy Period

For Gilts.

Ration A. Corn 88 to 90; Tankage 10 to 12; Salt free access.

Ration B. Corn 50 to 75; Alfalfa 25 to 50; Salt free access.

Ration C. Corn 65; Alfalfa 30; Tankage 5; Salt free access.

Ration D. Corn 30 to 50; Skim or Buttermilk 50 to 70; Salt free access.

Ration E. In self feeder, Corn ground 48; Alfalfa ground 48; Salt free access; Tankage 4.

For Older Sows.

Practically the same rations as above, raising or lowering the corn and alfalfa allowance to control fatness of

the sows. Old sows can eat a little more of both corn and alfalfa, especially if of big frames and thin.

For Suckling Sows.

For both Gilts and Older Sows.

Ration A. Corn 70; Middlings 15; Tankage 15; Salt free access.

Ration B. Corn, all well cleaned up with a separate mixture of Middling 3, tankage 1, according to appetite, fed either dry or as slop. Salt free access.

Ration C. Corn self-fed, Middlings self fed, Tankage self fed; Salt free access.

Corn may also be soaked for sows with pigs following.

The feed ration of suckling sows should be limited the first 10 days after farrowing, getting up to full feed as quickly as conditions warrant. Improvement can be made to add "Free access to wood ashes and charcoal," in connection with salt to every ration, whether it be of breeding, growing or fattening hogs in either dry lots or pastures.

Successful Rations when Hogs are Running on Pastures of Forage Feeds

When in high protein pastures such as: alfalfa, rape, clovers, tender growth blue grass, timothy, rye and wheat.

For Suckling Pigs Weighing up to 40 Lbs.

USE EITHER RATION.	}	<i>Ration A.</i> Corn self-fed; Middlings self-fed; Tankage self-fed; Salt free access.
		<i>Ration B.</i> Corn self-fed; Tankage self-fed; Salt free access.

Little pigs will not over eat of tankage when running on succulent pasturage, especially of alfalfa or clover.

For Weanling Pigs, 30 to 100 Lbs.

USE EITHER RATION. { *Ration A.* Corn 0 to 95; Tankage 5 to 10; Salt free access.
Ration B. Corn self-fed; Tankage self-fed; Middlings self-fed; Salt free access.

Weanling pigs running on succulent alfalfa will eat about 94 to 96 of corn and 4 to 6 of tankage.

For Shoats 100 to 175 Lbs.

USE EITHER RATION. { *Ration A.* Corn self-fed or hand-fed; Salt free access.
Ration B. Corn self-fed; Tankage self-fed; Salt free access.
Ration C. Corn self-fed; Tankage self-fed; Middlings self-fed; Salt free access.

For Hogs 175 to 250 Lbs.

Ration A. Corn hand or self-fed; Salt free access.

For Hogs 250 to 300 Lbs.

Ration A. Corn hand or self-fed; Salt free access.

For Fattening Sows for Market. All Ages.

Ration A. Corn hand or self-fed. If in poor condition, Tankage, Skim or Buttermilk fed until they get nicely started to flesh good.

For Pregnant Sows.

Ration A. Corn with a 5 to 10% of Tankage until sows are bred. Then put sows on corn until about a month before farrowing, when a limited amount of tankage or separated milk may be fed to increase milk production and insure good strong, lusty, active born pigs.

For Brood Sows Carried Through the Summer for Fall Breeding.

Ration A. Corn limited ration, regulated according to

gains and conditions desired. Change ration to corn and Tankage 10 days before farrowing. Feed liberally to increase number of pigs at farrowing.

When Hogs Are Running in Dry, Hard, Low Protein Pastures, such as: Old, Dry, Short Bluegrass, Sorghum, Millet, Timothy, Wheat, Rye or Sweet Clover of Second Year's Growth over 10 in. High.

Rations. Use same as recommended for all classes in

Dry Lot Feeding.

When "Hogging Down" Corn.

Forage grown shoats weighing from 100 to 150 lbs. are best adapted for "Hogging Down," but any class, especially older, thin hogs, intended for fattening, can be successfully turned into the corn field.

Ration A. Standing corn in which rape, rye, wheat, soy beans or cowpeas are growing. Allow salt free access and tankage, if supplementary green food is low.

Ration B. Standing corn, with run to adjoining fields of alfalfa or clover, rape, luscious tender bluegrass, or to a combination of one or more of these. Allow free access to salt.

Ration C. Standing corn clean of all other green foods. Allow tankage in self feeder and free access to salt.

All rations should be understood of having a free access to unlimited pure clean water of even temperatures.

The author believes that in starting shoats or hogs in "hogging down" corn, it is advisable, at least for a few days, to give them water and about a half ration of old corn or other concentrate foods, every morning before turning them into fields, and to drive them out after a few hours, feeding again lightly at night.

Again; do not make any abrupt or radical change of

the nature or amount of foods. For instance; the turning of dry lot hogs into succulent pastures or corn fields will cause serious digestion troubles oftentimes mistaken for cholera.

The changing of slop fed or pasturage grown pigs abruptly to dry feeds and lots will also cause an upset with attending scours, dysentery or constipation that will take considerable time and attention to overcome, if it does not precede serious infectious troubles. The abrupt turning of pigs into fields of green clover or corn for unlimited periods may result in the pigs bloating from gases generated from the immatured plants, which may cause an acute death or by the continued practice will set up chronic forms of derangements.

A FEW CONDENSED SUCCESSFUL FEEDING SUGGESTIONS

Ear corn is the best, most profitable, all around corn preparation. Shelled corn in self feeders comes next and soaked shelled corn is excellent to start little pigs with.

Common salt should always be fed to hogs, allowing free access to it after becoming accustomed to it.

Charcoal made from corn cobs, or wood, is excellent, especially when eating corn heavily.

Barley, rye, wheat, kaffir corn, milo maize or sorghum seed in ground form are quite similar to corn, and may be substituted if their price is favorable. Barley is the most efficient substitute for corn, while rye will cause digestive troubles when fed excessively.

Whole skim or buttermilk are the greatest physiological corn supplements, but the cost of the former and supply of the latter forces the use of tankage, wheat, middlings and oil meals, along with forages and pasturage as supplements to corn.

Good, sound, healthy, prolific, breeding stock, coupled

with good breeding selections and practices, good feeding, self watering, good housing (well lighted, dry and sanitary), provided with splendid range of leguminous pastures, managed by a man whose heart is in the business, who will combine and recombine the many factors and forces, effecting a harmonious working of all units to effect the right thing at the right time, will bring successful endings to attempted pork production.

THE WEIGHTS OF FEEDS

To give aid in compounding rations more on the quantity or bulk basis, or where it is unhandy to weigh the feeds every time, a weight table is given — 1 quart of the following foods weigh:

Corn, whole grain.....	1 lb.	14 oz.
Cracked corn	1 lb.	12 oz.
Corn meal	1 lb.	8 oz.
Corn cob meal.....	1 lb.	6 oz.
Oats, whole	1 lb.	
Oats, ground		12 oz.
Wheat, whole	1 lb.	14 oz.
Wheat, ground	1 lb.	13 oz.
Wheat, middlings	1 lb.	12 oz.
Wheat bran		10 oz.
Rye bran		10 oz.
Gluten meal	1 lb.	11 oz.
Gluten feed	1 lb.	3 oz.
Linseed meal	1 lb.	2 oz.
Cottonseed meal	1 lb.	8 oz.
Tankage	1 lb.	9 oz.
Separator milk	2 lbs.	
Water	1 lb.	12 oz.

CHAPTER XXXVII

IDEAL BUILDINGS

THE central community or farrowing hog house varies greatly in size, material and type, in conformity with the need of room, cost and accessibility of material and the builder's idea of adaptability and convenience.

The popular types of hog houses are based on either square, oblong or octagonal shaped ground plans.

The oblong type seemingly is in most extensive use. Its size is regulated largely by the need of farrowing pens. The popular size being as outlined below.

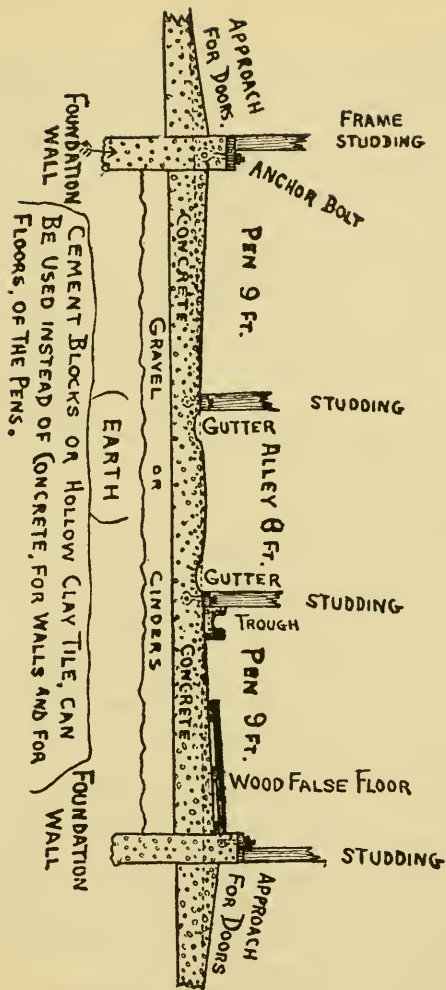
Dimensions: 24' x 48', with an alley-way 8' wide through the center longitudinally. The south half or sunny side is divided into eight pens each 8' x 8'. The north half is sub-divided in a like manner. It is advisable to construct all partitions between farrowing pens so that they are movable, thus allowing one or more pens or the whole side to be thrown together for convenience for feeding older pigs, brood sows or fattening hogs during inclement weather, also to effect better cleaning and disinfection of the quarters. Many construct the pens 8' x 10' and the alley-way 12' or 14' wide to permit the driving of a wagon through them.

The foundation and floor of the hog house are of utmost importance. The floor construction should always be such as will provide a solid, smooth, warm, dry, air tight floor without cracks or crevices, and one that will drain off or absorb moisture. In locating the site of a

hog house, particular care must be taken that the drainage of the ground be naturally away from all sides of the hog house if possible. Flat, low places and drainage courses should be avoided. The foundation should be started at least 12" to 30" into the ground and should be at least 8" to 12" in width.

Cement blocks, hollow tile or concrete make the best and most economical foundations and floorings. The foundation should be built at least 12" above the level of the ground. After the foundation walls have been constructed, the whole inner or floor area may be filled with rock, gravel, broken brick and cinders, tamping down well and covering over with concrete, making it level with the surrounding foundation walls, or better still, even with the door sills and foundation frame work. During the construction of walls and floors, iron pins or brackets may be set into the concrete at proper places for attaching the wooden super structure, and the floor may be sub-divided into blocks or pens, like cement sidewalks in sections. The detailed descriptions of but a few most popular houses will be given.

The "drop front" or double-row window type gives the most uniform sunlight to all parts of the house. The essential dimensions and features for a 24' wide frame constructed hog house are that the extreme elevation of the side walls be neither too high nor too low, the north wall usually about 6' 6" and the south wall about 6' in height. The studding on the north side of the alley being about 11' 6" and those on the south side about 16'. The whole offset or drop in the south roof being approximately 7'. This allows a continuous row of double sash windows for the entire length, giving space to arrange for ideal sunlight and ventilation. All windows should be on hinges and arranged with rope pulleys to open or shut easily. A single row of windows should be put in



GROUND VIEW OF A 24 FT. HOG HOUSE

the upper part of the south side above the pen doors to furnish sunlight for these pens, and a window in the roof over each pen of the south side will add to ideality, and give direct rays of sunlight during February and March upon the farrowing beds.

To secure larger pens on the north side, the driveway may be narrowed to not less than 6' 6". The dimension timbers used are 2" x 6" and 2" x 4". The siding being common sheeting boards covered with ship-lap or drop-siding. Shingles give best satisfaction for roofing. False wooden floors should be used on concrete floored pens during the winter and farrowing period. These are constructed of 1" boards nailed onto 1" x 4" or 2" x 4" made in two sections to fit each pen, and built so that they can be easily placed and removed when occasion demands.

The farrowing pens should have guard rails of either 2" x 4" or 2" x 6" all around the pen, about 8" above the floor. Improved guard arrangements to give better protection to the pigs are always advisable.

The cement floor should slope slightly towards the alley to give sufficient drainage of moisture and be slightly roughened on surface to prevent injury to hogs from slipping and sliding, but not so rough as to hold collections of moisture.

A good serviceable floor can be made of gravel, clay, cinders and dirt, by tamping down the former and then securely fastening close mesh hog wire, both ways or doubly from sill to sill; cover this with 2 or 3 inches of dirt, tamping down and occasionally adding dirt till perfectly hard. Hogs cannot root up this floor, and it is warm, dry and ideal for farrowing.

Attention should be given in construction to secure a well built house free from cracks or draughts, especially the floors and side walls. The doors and windows should

fit snugly, and be so arranged that their use, ventilation, and sunshine can be well regulated. The installation of ventilators in the comb of the roof will practically solve the ventilation problem.

If possible the hog house should have a watering system installed within or close by and a dipping tank or wallow place in close proximity.

The size of the intended hog house may be reduced or enlarged according to need or desire, improved or curtailed in plan and arrangements, as one deems best, but the general outline given here should always be followed, as it represents the general consensus of ideas and practices gained from years of experience.

All hog houses should be provided with pens, panels or some form of subdivision so that the hogs, especially young shoats, are prevented from "piling up" or overcrowding during inclement weather. This is one primary cause of pneumonia and other diseases.

THE IOWA SUNLIT COMMUNITY HOG HOUSE

This type of building has several highly commendable features, one being that, when equipped freely with roof windows, sunlight is poured directly upon all parts of the floor and side walls in the course of the day. The cost of construction is less than for some houses, being considerably reduced by the low side and end walls.

The most serious objection met with in the use of this type is the lack of sunshine in all pens at the same time and the leakage of snow and rain water through the windows; however, by the full use of especially manufactured metal framed windows these drawbacks are largely overcome.

Another recommendable feature is the sanitary effect produced by sunlight penetrating to all parts of the house, and of its invigorating effect upon new farrowed pigs.

These qualities, together with cost, durability, convenience, maintenance and arrangements inside and outside pens, commend its adoption by hog raisers in general.

Sunlit Community Hog Houses may be of masonry or frame construction, the latter being considerably cheaper but not so durable nor so handily kept sanitary.

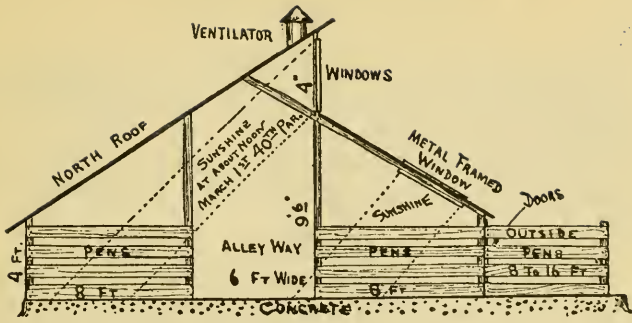
The foundation walls should be constructed of either concrete brick or stone, set well into the ground below frost level and, if convenient, tile drains should be installed leading from the low points of pens and alley ways down through the concrete floor and walls to the outside, where the drainage may be carried away by a larger sewer or emptied into a concrete catch basin.

The floor is laid over a deep bed of gravel or cinders, first using vitrified clay blocks over which is spread $1\frac{1}{2}$ to 2 inches of cement. The pen floors should slope well to the gutter-way along the alley and the alley or drive-way floor should slope well both ways to the same gutter-way. The alley and gutter-way should be of solid concrete construction. The walls may be either of vitrified clay, brick, concrete or cement blocks or lumber.

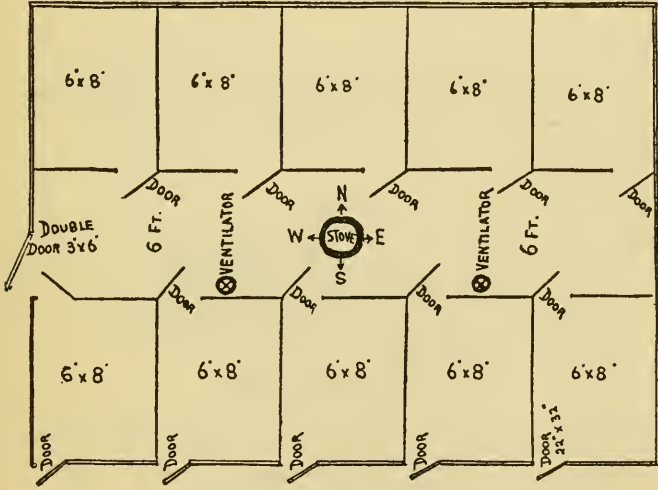
The door frames may be either of concrete or wooden construction, the former being more durable and air tight. Wooden doors answer best either hung from above or with side hinges. The south end wall windows may be of common construction, but the construction of the skylight windows is more important and standard hotbed sash can be used. Greenhouse sash with double strength glazed glass or especially manufactured metal framed sashes are best and most advisable.

The glass should be protected against hail with a covering of heavy hardware cloth; practically any form of standard roofing may be used upon this type of hog house.

The frame construction of inside pens embraces the use of 6" x 6" posts, secured in place by metal grooves



22 feet wide, pens 6x8, with doors and pens on south side



Ground Floor Plan

AN IDEAL, CHEAPLY CONSTRUCTED HOG HOUSE

set in concrete while the panel partitions are held in place by metal grooves along the back walls or by upright posts extending to the rafters.

The pen fenders are made by placing a 2 x 4 inch iron brace 8 inches out from the wall and 8 inches above the floor.

For troughs the small, light, movable type is best.

For ventilation, the cupola coupled with the arrangement where most of the skylight windows can be opened provides ideality for this essential feature. The following list gives the itemized materials for the construction of a masonry built Iowa Sunlit Community Hog House.

MASONRY

- 65 bbls. Portland cement.
- 45 cu. yds. Sand and gravel.
- 1200 — 4" x 8" x 12" hollow clay blocks for floor, second grade.
- 800 — 5" x 8" x 12" hollow clay blocks for wall, selected.
- 84 — Common brick for corners.
- 2 bbls. lime.
- 100 pieces 4" sewer pipe.
- 10 pieces 4" sewer pipe y's.

STEEL AND REINFORCING

- 120 pieces $\frac{1}{4}$ " x 12' twisted sq. bar reinforcing.
- 20 pieces $\frac{1}{2}$ " x 12' twisted sq. bar reinforcing.
- 25 pieces $\frac{1}{4}$ " x 2" x 12' mild steel bars for fenders.
- 20 pieces $\frac{3}{8}$ " x $\frac{3}{4}$ " x 6' mild steel door catches.
- 20 pairs 6" strap hinges.
- 6 pairs 4" "T" hinges.
- 20 pairs 8" screw hook and strap hinges.

LUMBER

- 6 pieces 4" x 4" x 16' No. 1 fir center posts.
- 10 pieces 2" x 6" x 12' No. 1 Y. P. girders.
- 42 pieces 2" x 6" x 16' No. 1 Y. P. rafters.
- 20 pieces 2" x 4" x 16' No. 1 Y. P. fenders.
- 4 pieces 2" x 6" x 18' No. 1 Y. P. sash holders.
- 4 pieces 2" x 6" x 14' No. 1 Y. Y. sash holders.
- 80 pieces 1" x 8" x 14' No. 2 Y. P. shiplap for sheathing.
- 80 pieces 1" x 8" x 18' No. 2 Y. P. shiplap for sheathing.
- 20 pieces 1" x 6" x 12' No. 2 W. P. board cross ties.
- 36 pieces 1" x 6" x 16' No. 2 W. P. D. & M. for doors.
- 3 pieces 1" x 8" x 18' No. 2 W. P. board door cleats.

- 7 pieces 1" x 6" x 16' No. 2 W. P. board door cleats.
- 12 pieces 1" x 4" x 16' No. 2 W. P. board door cleats.
- 18 pieces 1" x 8" x 16' No. 2 W. P. board partitions, gates, etc.
- 44 pieces 1" x 6" x 16' No. 2 W. P. board partitions, gates, etc.
- 14 pieces 1" x 8" x 12' No. 2 W. P. board partitions, gates, etc.
- 30 pieces 1" x 4" x 14' No. 2 W. P. board partitions, gates, etc.
- 10 pieces 1" x 10" x 16' No. 2 W. P. board for form.
- 10 pieces 1" x 4" x 16' No. 2 W. P. board for form.
- 10 pieces 1" x 8" x 16' No. 2 W. P. board for form.
- 12 pieces O. G. battens 16' long.

HARDWARE

- 1 gross #11 F. H. Bt. screws. 1 $\frac{1}{4}$ ".
- 3 doz. #6 wire screw eyes.
- 20—6" chain bolt locks.
- 4 sets bird proof door hangers.
- 32 ft. B. P. track.
- 10 lbs. 20 D nails.
- 15 lbs. 10 D nails.
- 50 lbs. 8 D nails.
- 120— $\frac{3}{8}$ " x 3" mach. bolts.
- 108— $\frac{3}{8}$ " x 2" mach. bolts.
- 72— $\frac{1}{4}$ x 1 $\frac{1}{2}$ " carriage bolts.
- 38— $\frac{1}{2}$ x 12" mach. bolts
- 10 prs. 3" butts.

MISCELLANEOUS

- 17 sqs. 3-ply, prepared roofing.
- 6—4-light barn sash 9" x 12" glass.
- 2—18" galvanized ventilators.
- 38—sky-light sash 3' x 4'.
- 38 pr. 3" gal. butts for sash.
- 10—cellar traps 9" x 9".
- 1 gal. ready mixed paint to double coat 250 sq. ft.

HALF MONITOR ROOF TYPE OF HOG HOUSE

This is a type of house which has been in use for many years and has become a standard. It has certain recognized points of merit which will commend themselves to the up-to-date swine producer.

As previously stated, this type of house is designated by the arrangement and location of the windows. A row of vertical windows is provided for lighting each of the two rows of pens. The house extends with the long axis east and west, and is not at all adapted to any other

direction. When the windows are placed at the right height, direct sunlight will shine into both rows of pens at the same time. If plenty of windows are provided, the pens will be quite thoroughly lighted.

It is to be noted in this connection that the use of vertical windows does not admit an excessive amount of sunlight during the summer months when the inclination of the sun's rays on the earth's surface is nearly perpendicular, in fact by using a wide cornice practically all of the sunlight may be cut off.

The principal disadvantages of the Half Monitor Roof hog house are: first, a large amount of space is enclosed for no other purpose than to provide a free access of sunlight, then again the entire house does not come under the direct influence of the sunlight as is the case of the Iowa Sunlit type of hog house. A part of the floor near the south wall, for instance, where the beds are located, does not at any time come under the influence of direct sunlight except when the doors are opened.

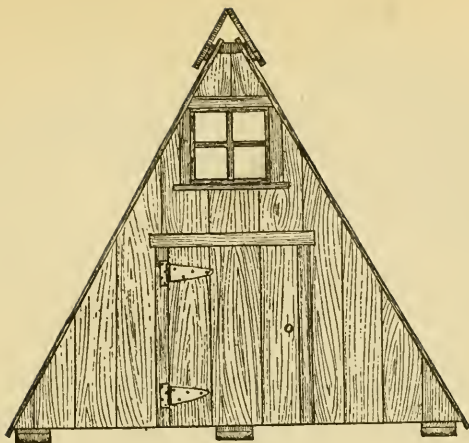
It is possible to build the walls of the Half Monitor Roof type of house of masonry. The construction, in other respects does not differ materially from the construction of the Iowa Sunlit type of house, but the walls must necessarily be built higher, especially the south wall carrying the lower row of windows. The inside arrangement may be much the same.

LIST OF CONSTRUCTION MATERIAL

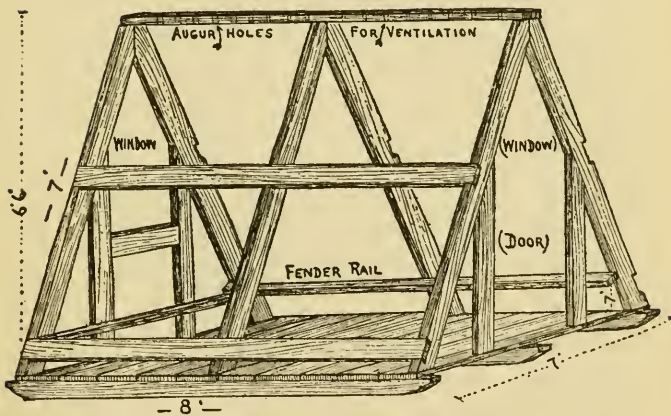
Half Monitor Roof. (Size 25 x 60 feet, 20 pens, each 6 x 8 feet, and side walls as specified.)

MASONRY

- 60 bbls. Portland cement.
- 40 cu. yds. sand and gravel.
- 1200 — 4" x 8" x 12" hollow clay blocks for floor, 2nd grade.
- 800 — 5" x 8" x 12" hollow clay blocks for wall, selected.
- 84 common brick for corners.
- 2 bbls. lime.



Front View



Frame View

THE WIGWAM OR A-SHAPED INDIVIDUAL HOG HOUSE

STEEL AND REINFORCING

- 18 — cast iron sockets for posts 4" x 4".
 20 pieces $\frac{3}{8}$ " x $\frac{3}{4}$ " x 6" mild steel door catches.
 32 pieces $\frac{1}{4}$ " x 12' sq. twisted reinforcing.
 12 pieces $\frac{1}{2}$ " x 12' twisted reinforcing.
 54 — $\frac{1}{2}$ " x 6" flat-head toggle bolts.
 10 pairs 6" strap hinges.
 26 pairs 4" T hinges.
 25 pieces $\frac{1}{4}$ x 2" x 12' mild steel bar for fenders.

LUMBER

- 21 pieces 2" x 6" x 20' No. 1 Y. P. rafters.
 11 pieces 2" x 6" x 18' No. 1 U. P. rafters.
 18 pieces 4" x 4" x 10' No. 1 fir center posts.
 15 pieces 2" x 6" x 12' No. 1 Y. P. plates and girders.
 5 pieces 2" x 8" x 12' No. 1 Y. P. ledges.
 20 pieces 2" x 4" x 12' No. 1 Y. P. plates and studs.
 20 pieces 2" x 4" x 10' No. 1 Y. P. plates and studs.
 5 pieces 2" x 6" x 14' No. 1 Y. P. cross ties.
 20 pieces 2" x 4" x 16' No. 1 Y. P. fenders.
 172 pieces 1" x 8" x 16' No. 2 Y. P. shiplap for sheathing.
 28 pieces 1" x 6" x 16' No. 2 W. P. D. & M. for doors.
 3 pieces 1" x 8" x 18' No. — W. P. board door cleats.
 5 pieces 1" x 6" x 16' No. 2 W. P. board door cleats.
 18 pieces 1" x 8" x 16' No. 2 W. P. partitions, gates, etc.
 44 pieces 1" x 6" x 16' No. 2 W. P. partitions, gates, etc.
 16 pieces 1" x 6" x 12' No. 2 W. P. partitions, gates, etc.
 14 pieces 1" x 8" x 12' No. 2 W. P. partitions, gates, etc.
 14 pieces 1" x 8" x 16' No. 2 W. P. board cornice.
 10 pieces 1" x 6" x 12' No. 2 W. P. board cornice.
 8 pieces 1" x 4" x 16' No. 2 W. P. board cornice.
 5 pieces 1" x 4" x 16' No. 2 W. P. board for forms.
 5 pieces 1" x 8" x 16' No. 2 W. P. board for forms.
 5 pieces 1" x 10" x 16' No. 2 W. P. board for forms.
 20 pieces 1" x 6" x 16' No. 2 W. P. board window framing.

HARDWARE

- 1 gross No. 11 F. H. Bt screws $1\frac{1}{4}$ ".
 10 — 6" chain bolt locks.
 20 pr. 4" strap hinges.
 10 lbs. 20d nails.
 20 lbs. 10d nails.
 70 lbs. 8d nails.
 120 — $\frac{3}{8}$ " x 3" mach. bolts.
 108 — $\frac{3}{8}$ " x 2" mach. bolts.
 8 pr. 6" T hinges.

MISCELLANEOUS

- 26 — barn sash 4-light 9" x 12" glass.

20—barn sash 12-light 9" x 12" glass.
19 sqs. 3-ply prepared roofing.
1.6 gals. ready-mixed paint to double coat 400 sq. ft.

The detailed descriptions of innumerable plans and types of hog houses could be given, in fact the complete details would make a volume in itself; hence only the essentials with a few details of the most practical and popular houses are here given.

SUNSHINE IN THE HOG HOUSE

One of the greatest essentials of a farrowing hog house is the amount and duration of sunshine secured daily directly upon the greater part of the floor in the farrowing pens. Many hog men either unknowingly or indifferently construct hog houses without due regard to this essential. Hence many hog houses are dark, gloomy, cold, damp and ill ventilated boxes or bins, rather than ideal places for brood sows and their young to inhabit.

The Government in a bulletin gives a table whereby every hog raiser can construct or remodel his hog house so that the sunshine may be best obtained over the greater part of the hog house floor, especially between the hours of 10:00 A. M. and 2:00 P. M. The key with which the table is operated is as follows, for example: The intended hog house being of the drop front type, is 22 ft. wide, the pens 8 ft. long and the alley 6 ft. wide. The length of the north pen and the alley way added together equals 14 ft. This represents the entire length of floor to be computed in finding the extreme top of window at any given latitude during noon hour of the first days of February, March and April. For example, 14 ft. represents length of floor—the top of windows should be 12 ft. 9 in. in a hog house near the 40th parallel of latitude for March 1st farrowing use.

Another way to figure these heights is to lay down a plank of the intended width of pens and hold another plank perpendicular at the south end and when the shadow reaches the north end, the height of the upright plank at the south end will be the actual height that the top of the window should be at noon of any day and latitude taken.

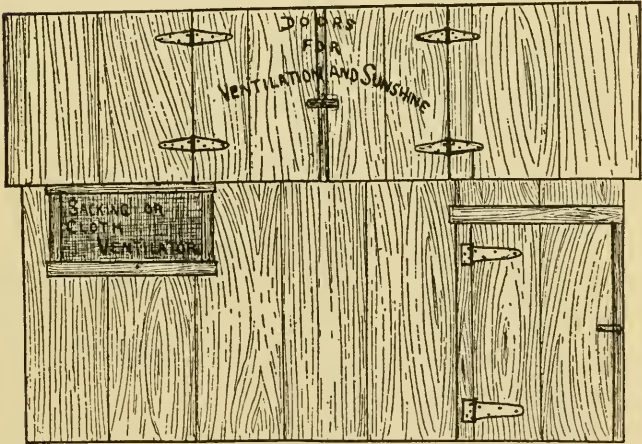
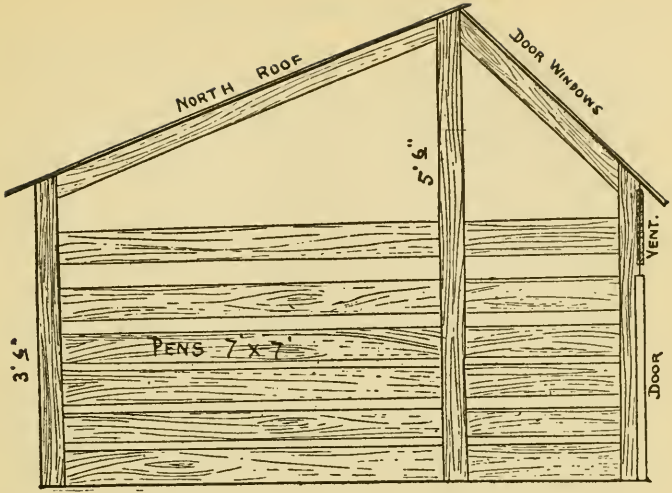
INDIVIDUAL MOVABLE HOG HOUSES

The individual type of hog house has proven practical and successful when properly used, either alone or in connection with a central house. Both the central and individual type of houses have their own peculiar merits and demerits and by combining them, ideality is most nearly secured.

The most prominent advantages of the individual house are their movable adaptability, changing locations from farrowing yards to pasture, back to feeding yards, latterly into battery-rows for winter time convenience. Thus their range of adaptability is very wide, their use permitting the isolation of mother and litter, permitting better sanitation, and effecting a better system of quarantine. The construction of these types varies considerably, including the "A" shaped, the gable roof, combination, tepee and economy.

The "A" shaped type perhaps is the most popular. It is constructed with various differing features upon the "A" shaped frame work. The main features being very similar, the differences being the forms and systems of ventilation, doors, windows and sunlight.

The "A" shape or wigwam hog house owes its popularity to its cheapness, service, adaptability to be moved about and to keep in sanitary condition. The credit of its origin really belongs to no certain hog man. The original types of the "A" shaped hog houses were in use



A CHEAP, SERVICEABLE INDIVIDUAL HOG HOUSE

by the earliest breeders. Most hog men have practically adopted the following outlined type.

Floor dimensions: 6' x 8' extreme height or 7' x 7' x 7'. Any dimension approximately will answer, but experience recommends given ones. The sills or runners are usually 4" x 4" or poles with top side hewn flat. There should be at least three running longitudinally, with the house, at least 9' in length.

A plank floor of 2" x 12" or better a double floor of 1" x 6", or 1" x 12" laid to overlap the cracks nailed into the sills or runners. Then the 2" x 4" frame work is built up over the floor. Six rafters are cut and joined with the 2" x 4" ridge pole at the apex. The ridge pole is 8' long and the rafters are 7' long. Each side should have three upright rafters and these should be strengthened and arranged to fasten the side or roof boards on to, by having three 1" x 4" counter-sunk longitudinally. The roof or sides of tight fitting and grooved 1" x 6" or 1" x 8" boards is nailed upright over the side frames.

To secure ventilation bore a line of auger holes through the peak 2" x 4" and cap the entire top with two 1" x 8", or 1" x 12" boards nailed together in "V" shape and inverted over the top, supported above the roof at intervals by 1" blocks.

The ends of the house require additional 2" x 4" for doors and windows placed about 2' apart. The door should be 2' wide and at least 2' 6" or 8" in height. The window in upper part of the back end 2" x 1' 6". Both door and window should be hung on solid hinges and equipped with strong fasteners.

Around the entire inside a pig fender of 2" x 4" should be counter-sunk into the frame work about 8" above the floor.

The materials are roughly as follows:

1 Board	4" x 4"	16 ft. long
1 Board	4" x 4"	8 ft. long
8 Boards	2" x 4"	16 ft. long
3 Boards	1" x 4"	16 ft. long
4 Boards	2" x 12"	16 ft. long
16 Boards	1" x 10"	16 ft. long

The cost in all ranges from \$15.00 to \$25.00. These houses can be clustered together in feed yards during the winter, and make ideal shelters, as they are warm, well ventilated and prevent "piling up" or crowding of the hogs.

One type is arranged so the sides may be opened as doors, another type has hinged doors and windows, while another may have sliding doors and glass windows. One type secures ventilation along under the entire length of comb board, while others have a box-like ventilator in the middle of the top.

The hog man may exercise his own fancy and experience in constructing these houses. Generally speaking, the well built, simple type house proves most satisfactory.

OPEN HOUSES, SHELTERS AND SHADES

The best natural shade for a hog is secured from individual trees, of heavy foliage and wide branching limbs, where the hog can secure a cool shade and any breeze that blows. The shade of dense groves or tangled underbrush is not advisable on account of the lack of air and sunshine for germ killing agencies. Where natural shade does not exist, shelters should be provided. The most popular type is built along the side of fences, placing posts opposite the fence posts, nailing cross pieces about three feet above the ground and overlaying with old boards, brush, hay, straw, etc.

An ideal shelter is the portable type, as it can be moved about the farm and thoroughly disinfected.

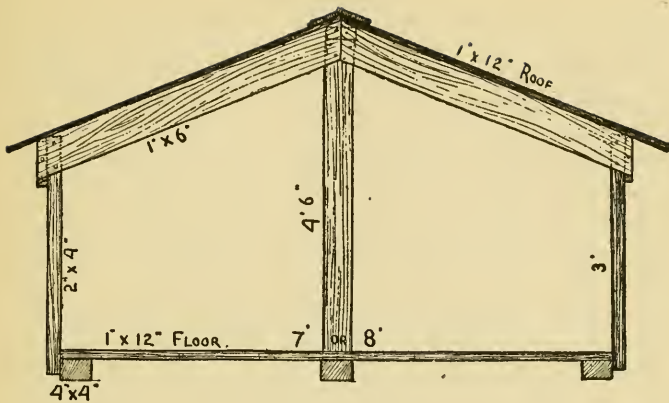
The floor dimensions depend on the number of hogs using the shelter. The following is a good serviceable shelter:

Two or more runners, 2" x 4"s, or 4" x 4"s, or poles that have been hewn flat on top, form the sills for the floor, which may be covered if desirable with one-inch boards, preferably old ones. Three foot uprights of 2" x 4" may be nailed at each corner and on the sides and ends, every four feet. Only one side board is necessary, it being nailed flush with the top of the posts all the way around. The center posts should be a foot or more higher, to give the roof a slight slope each way. A 2" x 4" is nailed to the posts, forming the ridgepole, and braces may be nailed crosswise and otherwise, to give rigidity and strength to the roof structure. The roof may be of almost any kind of board material that fits snugly together, keeping out the sunshine or deluges of rain. Old hay, brush or straw may be thrown over the roof to insure better protection.

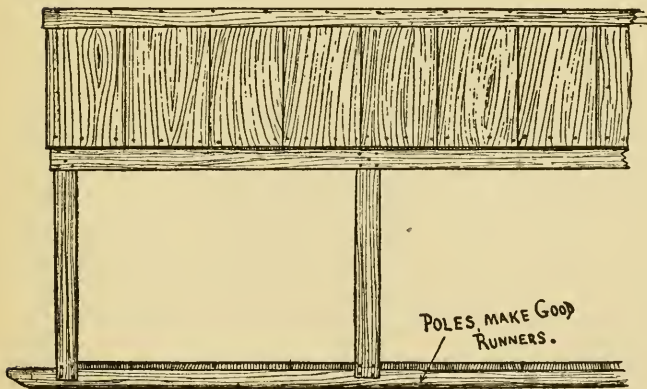
During inclement weather, especially made panels may be used to close up the open sides. The front panel being equipped with a door, easily converts the open shelter into a fairly comfortable hog house for temporary usage, especially for fattening hogs during the fall months.

FENCING AND GATES

The fencing upon all stock farms should be of the best materials, durable and permanent. The most serviceable and practical are wood posts and close-meshed woven wire. Steel and concrete posts are also advisable and extensively used. For close, small yards and pens, common fencing boards are generally used, usually in panel forms, so that they can be changed about readily.



End View



Side View

THE SHELTER OR SHADE HOUSE

In constructing an ideal hog fence, enclosing a field or yard of considerable area, the posts should not be more than sixteen feet apart, and set at least two feet into the ground. Shorter posts may be set midway between to strengthen the fence line and to keep the bottom line of the fence down to the ground. To prevent hogs from rooting under woven wire fences, a common barbed wire should be stretched and stapled to the posts at ground level, or metal ground fasteners may be used.

Woven wire fencing for hogs should be of a nine or ten mesh gauge, with the meshes not more than twelve inches apart laterally, and ranging from three inches at the bottom to six or seven inches at the top, according to height. The usual height of hog fencing ranges from twenty-six to thirty inches. It is false economy to experiment with light gauged or wide meshed wire fencings.

To prevent hogs from getting over, and to make it a combination stock fence, two or more barb-wires may be stapled at proper spacings above the woven wire. Some hogmen put up a regular stock fence 4 or 5 ft. high, topping it with one or more barbed wires.

The rigidity of the corner and gate posts is one of the greatest essentials in hog fence building. No fence will remain hog-tight unless the corner posts, end posts and gate posts stay exactly where placed and hold without any give of the stretch and strain of the tightened wires of the hog fencing.

Heavy, gnarly, hardwood posts, eight or ten feet in length and from eight to sixteen inches in diameter, set from three to four feet into the ground, properly anchored and braced and arranged so that the post absolutely will not budge, give excellent results.

Concrete posts, when properly placed, give as good or better results.

All gates used on a hog farm should be strongly con-

structed, somewhat heavy, and arranged so that they will open and handle easily by man but be made so that it will be impossible for hogs or other live stock to open them. These gates may be constructed of one by six inch boards, framed and braced to prevent sagging.

Patented gas pipe, iron or galvanized steel framed gates are advised. All gateways should be wide enough to permit driving a wagon through, except those of quite small enclosures, as pens about the hog houses.

To make hog fences more secure to hold boars, "fence-busters" or "creepers," the fence may be doubled by placing woven wire on each side of the posts and setting in anchor ground-hooks, every four or eight feet to the lower strands of the woven wire.

Osage, oak, walnut or cedar posts are quite generally used in farm fencing and, when properly seasoned and either dipped in a preservative preparation or set in cement, they will wear very satisfactorily.

A HOG WALLOWING VAT

Hogs by nature are cleaner than they are given credit for generally. They naturally prefer sand bedded or rock bedded streams to stinking mudholes. During the summertime, hogs seek cool, moist, airy places, mud or water holes to lie in. Hog wallows aid in bringing the heat to the surface of the body.

Hogs also practice Nature's plan of preventing and eradicating parasites by smothering and drowning them in mud and water. So man should supply the hog with both a clean lying and wallowing place. Nature's streams are the best, and clean mud is better than stagnant mud holes, but good substitutes can be artificially constructed of concrete. A simple way to make a wallowing vat is to dig out a place at least two feet deep of size needed and concrete the bottom twelve inches deep, and run a

side wall up to six inches above the ground on sides and back. The vat should have a slope from front to back and from the front, which is on ground level, out onto a sloping draining apron running out for 8 or 10 ft. The vat should not be made to hold over 12 inches of water at the deepest point (the back end), and to have a drain pipe leading out from the lowest place. Clean out and freshen the water every few days.

An open shed may be constructed over the vat and fenced on one or more sides.

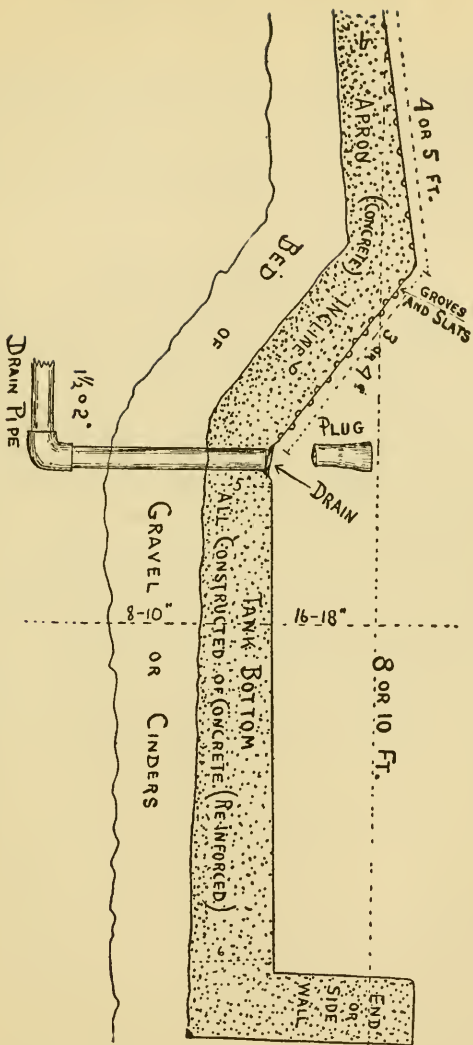
Some hog men make the vat double, by constructing sloping aprons on both ends, so hogs can enter or depart from either end. Medicated, crude or coal oil or cresol dip is poured into the water in a quantity that will just cover the surface. The pigs will do the rest. The sun should shine on part of the water to keep it near normal temperature, to aid the hog in avoiding rheumatism, etc., by lying too long in chilled water.

These, in connection with nearby, dry, open shelter sheds, will provide the hogs adequately with everything they formerly derived from Nature's streams, mudholes and shady timber.

RUBBING POSTS

Many of the patented hog oilers have high, recommendable features and give excellent results in applying oils, etc., to destroy and keep down parasites on hogs, but an old time result producing, cheap, rubbing post can be easily made by wrapping old burlap sacks around posts in the different hog yards. The burlap should be stapled on with long staples and soaked every week with medicated, crude or coal oil.

Heavy, short, cedar posts may be set deeply into the ground and an auger hole bored down through the center of the top of the post, hollowing out quite a capacity. Oil



HOG WALLOWING TANK. SECTIONAL SIDE VIEW

poured therein will slowly work its way out to the burlap through the cracks or nail holes that are driven towards the center to effect this result. At the top of the post may be secured a small pail having a small nail hole in the bottom, through which the oil can leak into the hole of the post.

THE BREEDING CRATE

The use of hog breeding crates is recommended to mate all animals that are difficult to breed naturally or on account of their difference in size.

The best results are generally secured by allowing the animals to mate naturally, with but one service, after both animals have fully aroused their passions. This is particularly true in using the breeding crate, for the practice of forcing and fastening the sow in the crate when of unknown state of heat and forcing a service is an unnatural manner of mating and accounts for many bad results and criticisms of the use of breeding crates. There are several good types and makes of breeding crates on the market, and cheap homemade crates can be conveniently constructed, or pits may be arranged for the sow to stand in, or elevations for the boar to stand up on.

CHAPTER XXXVIII

FEEDING EQUIPMENT

THE feeding utensils of every hog raiser should be arranged to meet most of the essential requirements.

First, they should be of a nature and quantity to handily and amply perform tasks of usage quickly and economically.

Second, they should be of serviceable and sanitary construction, of good wearing material and solidly constructed, with but few cracks or interstices, wherein food-stuffs may lodge and decay.

Third, their maintenance must always be sanitary.

Fourth, all utensils that are badly worn or from any cause are possible germ breeders should be replaced with new ones.

Most hog men use barrels to contain and soak feeds, corn, oats and millfeed slops. Vinegar and cider barrels serve excellently for this purpose. It is very important that the barrels be emptied at least every few days, slushed clean with water and let dry for a few hours in the sun before refilling.

Many hog men add a few teaspoonfuls of baking soda into each barrel of soaking feed or slops and many use a small teaspoonful of concentrated lye to each barrellful of corn or oats. A can of lye, punctured two or three times with a nail, kept in the barrel until entirely dissolved, or a few teaspoonfuls of some cleansing dip solution is recommendable.

The soaking feeds, or slops, should not remain in barrels, containers or utensils for over twelve hours, nor should foodstuffs be allowed to sour, ferment or encrust either inside or outside. If feeding utensils cannot be kept sweet and clean, don't use them.

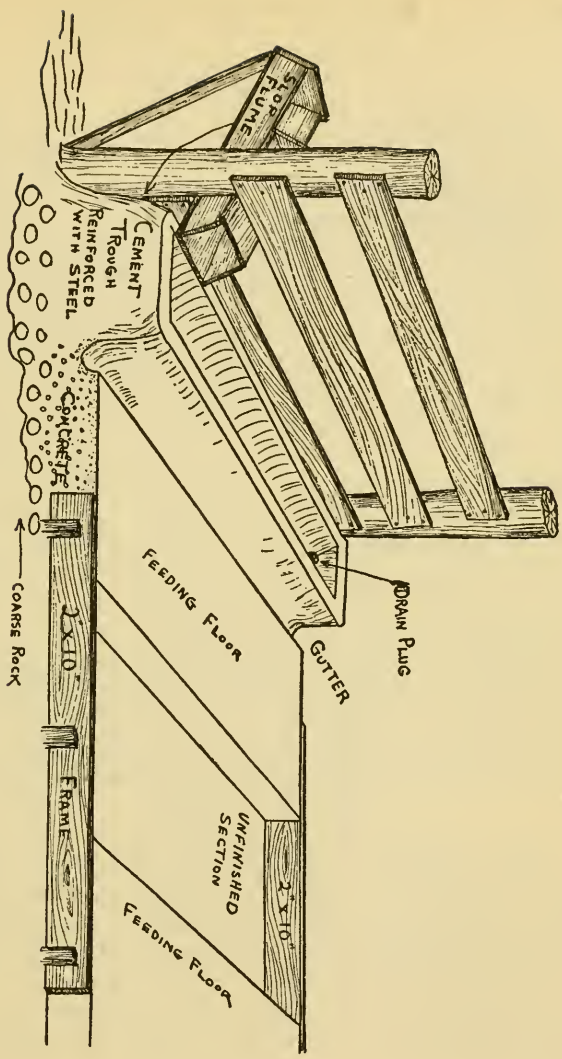
Where hog raising is operated on a large scale, horse and man drawn feeding carts, or containers, are extensively used. The low platform wagon, two wheeled cart and stone-boat sled, of from one to three or four barrel capacity, are commonly employed. Feeds are quickly conveyed to all lots over the farm and handily distributed therefrom with pails.

Feeds may also be prepared to soak until the next feeding in pails or galvanized or wooden tanks.

Every hog farm should have a well constructed house wherein all hog feeds may be kept dry and clean, and to contain all feeding utensils. It should also have direct connection with a good supply of pure water and always be maintained in a sanitary condition. Disinfectants should be used frequently therein and all animal life kept excluded, especially hogs, fowls or rodents. No one other than the farm help should trespass upon the premises.

Barrels or containers that have heavy incrustations of feeds, or are sour smelling or rancid, covered with or containing hundreds of flies, may be rightly termed as excellent disease breeders. Do not feed from or with such utensils. The practice is unhygienic, harmful and almost criminal. Soaked foods or slops should not remain in the feeding trough from one feeding to the other. Always feed sparingly, and should any food remain clean it out before placing new food therein.

SECTION OF SANITARY FEEDING FLOOR AND TROUGH UNDER CONSTRUCTION



WATERING SYSTEM

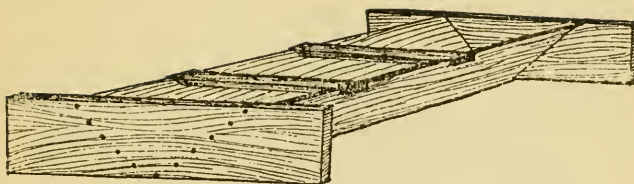
The watering system of the hog farm is a most important feature. Too much importance cannot be placed upon the accessibility, purity, amount and installation of handy, dependable devices to provide water. Water may be considered as a good half of the hog's ration.

Wherein Nature does not supply water handily by springs and running streams, the next best method is to create and utilize deep, good covered wells. These or distant springs may be connected and harnessed up with a pipe line emptying into a storage tank, having a direct pipe line to all hog quarters and pens. At the end of these lines, hog waterers, or open troughs, should be placed on clean kept cement or plank platforms.

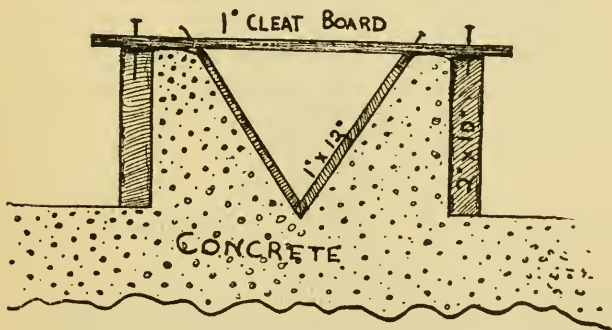
Hog waterers should be shaded in the summertime and the water kept temperate by artificial heat during the winter months. Many hog men have hog waterers, cisterns or faucets installed in the hog house. The form of hog waterer used is not so essential as is the cleanliness maintained and accessibility thereto by all hogs, and its adaptability in keeping the water at even temperatures, both winter and summer. Clean, pure water accessible at all times is largely accountable for good, healthy, growthy pigs and of enviable breeding and fattening hogs.

FEEDING FLOORS

Every hog farm should have a clean, hard surfaced floor upon which hogs may eat grains and other foods. Many hog raisers are in the habit of feeding on the ground, regardless of its condition, dusty or muddy, and of the effect upon the hogs. The feeding floors should be so located that they do not receive drainage and where much dirt, filth or excrement cannot be tracked onto them.



OLD STYLE V-SHAPED TROUGH



NEW STYLE CEMENT TROUGH

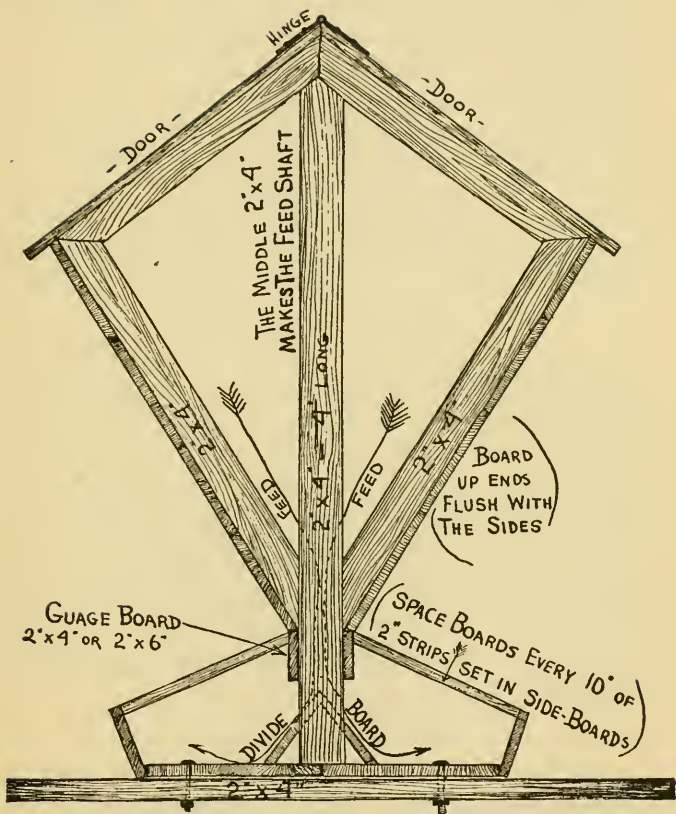
The ideal location for the feeding floor is on the south or sunny sides of buildings, upon slight elevations or side hills. Its construction should be of concrete, made in the usual manner, to secure an enduring floor and surface. The surface should be roughened to prevent the hogs slipping and sliding. The outer edge of the floor should be sloped downward slightly in order to secure good drainage. To prevent cracking, by action of elements, the floors should be made in sections as are sidewalks. The squares should never exceed six feet. The area of the floor depends on the number of hogs. One hundred pigs require a feeding floor of at least 24 x 48 feet. It is advisable to make small feeding floors in every individual pen on the hog farm. The feeding floor should be washed, cleaned and disinfected frequently. Well arranged, sanitary feeding floors provide clean foods, a saving of waste, less dirt and disease.

The source of water supply should be either upon or near the feeding floor. All feeding floors should be at least six inches above the surrounding ground and have broad inclines on each side for convenience to the pig and as an aid in cleanliness. Troughs of wood or cement may be fastened on the feeding floors.

HOG TROUGHES

The essentials of hog watering or feeding troughs are durability, cleanliness and accessibility. Cast iron, cement or galvanized troughs that do not have cracks or joints wherein feed and dirt may enter and lodge, are ideal. Wooden troughs are temporary makeshifts,—harborers of decaying foods, germs and filth. No special type is recommended, the usage and care taken of them determines largely the recommendation of any one type above another.

Always place the troughs on a cement or wood floor or



A SIMPLE SELF-FEEDER. END VIEW

on an elevated spot that will drain and dry quickly. Never install troughs permanently in hog houses or shaded places, low places or at the lower end of drainages. Pigs track in dirt, filth and germs. Always clean out the troughs at least once a day and allow the sun to shine directly into them, to kill the germs.

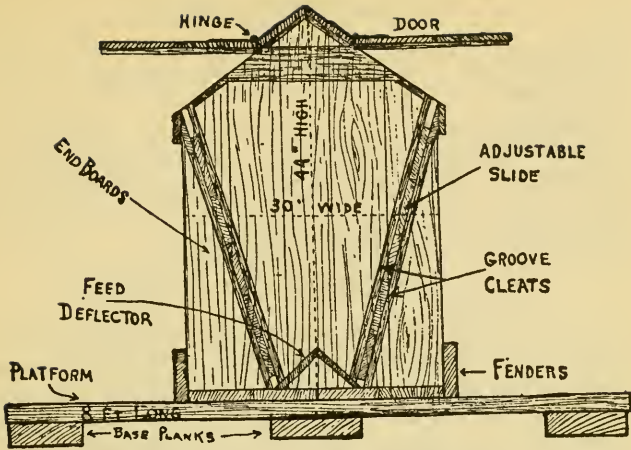
Troughs of all sizes are used, varying from the small individual trough to the big feeding pen, size 10 or 16 feet in length, 10 to 12 inches in width and 4 to 6 inches in depth. The round bottom troughs are better than the square or "V" shaped ones. Most any form can be made of cement. The "V," rounded or box-shape are recommended.

ALFALFA HAY RACK

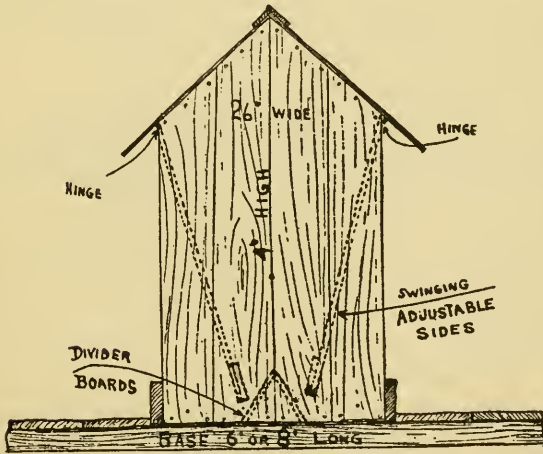
In feeding alfalfa hays, the waste, accessibility and cleanliness become important features. Alfalfa hay fed in sleeping quarters or on feeding grounds becomes trampled underfoot, and foul with excrement and filth, ultimately making considerable waste. Self feeders can be handily and cheaply constructed to place the alfalfa constantly before hogs in a wholesome state, with the minimum of waste. The principle of construction is very similar to that of hay feeding racks for sheep. Some hog men construct them in corners, alongside walls, or along fences. The main essentials are the slats and feeding trough.

SALT AND ASH FEEDER

Every hog farm should have one or more boxes or containers to hold ashes and salt and be of free access to all hogs on the farm. As these feeders are subjected to rough usage they should be built heavy and durable. Use the heaviest old planking available, or use new planking two or three inches thick. The bottom or ground



FEEDER NO. 2. END VIEW



FEEDER NO. 3. END VIEW

dimension should be at least three feet square, to prevent overturning.

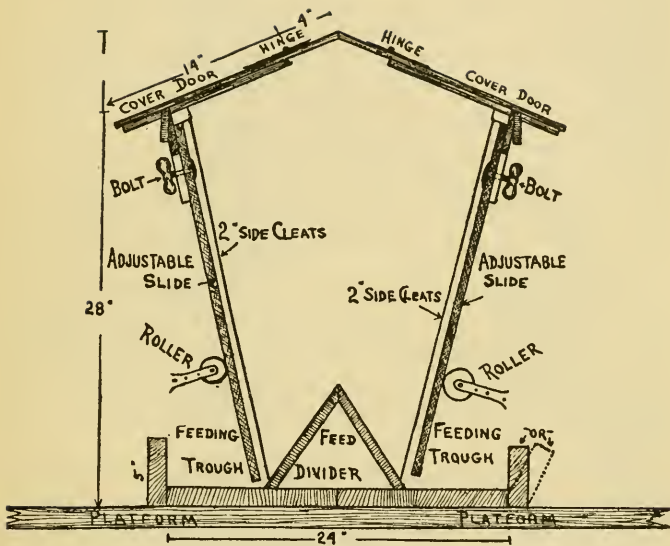
The container or trough can be nailed across the center and should be at least twelve inches wide. It can be two feet wide, but not over six inches high. These can be placed in houses, sheds, runways or in protected places of open yards or on the feeding floors.

A SELF-FEEDER FOR HOGS

Prof. John M. Evvard thus describes an ideal feeder: "The Iowa self-feeder (small single way) is easily constructed, being made of ordinary standard pine lumber. It can be made any size. The important consideration is that the inside trough should not be more than 5 inches deep nor less than 2 inches, the depth depending upon the size of hogs. The distance from the front of the trough to the control side should range from 7 to 9 inches, an average of about 8. The ordinary dimensions of the trough therefore will be 4 x 8.

"The removable control side works on two rollers; these may be replaced with ordinary wooden cleats measuring about 1 x 2 x 4 inches. These cleats work exceptionally well with meat meal or other ground feed. The rollers are of best advantage when shelled corn is used. To facilitate cleaning, the control slide may be removed by unscrewing the thumb nut which regulates the grain flow into the trough. Simply remove the bolt and then pull the slide out at the top.

"To insure a continuous flow of grains to the trough, place in the rear of the feeder at its base, a slanting board over which the grain must travel before reaching the opening which leads into the trough in front; the slant of this piece can be regulated, depending upon the pressure desired as the grain enters the feeding space. For ground grains, this should have a marked slant, but for



MATERIALS

A ROUGH PLANK OR CONCRETE PLATFORM, AT LEAST 3'x6' TO STAND ON.

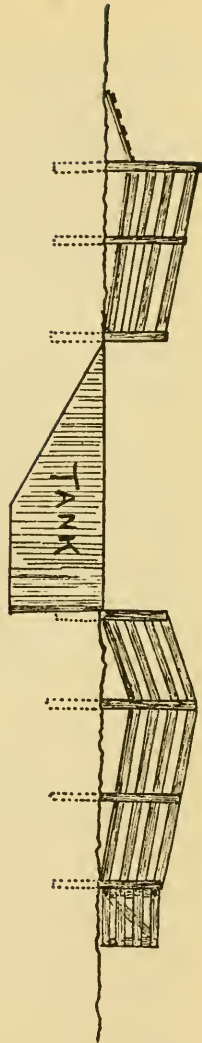
2 - 2" x 12" - 32" LONG FOR FLOOR.	2 - 1" x 4" - 39" LONG FOR COVERS.
2 - 2" x 5" - " - " - TROUGH.	4 - 1" x 4" - 26" - " - CLEATS.
2 - 1" x 4" - " - " - CLEATS	6 - 1" x 9" - 14" - " - "
2 - 1" x 6" - 27" - " - "	2 - 1" x 4" - 27" - " - "
2 - 1" x 4" - 27" - " - "	2 - 1" x 6" - 28" - " - DIVIDER BOARDS
4 - 1" x 12" - 29" - " - END BOARDS	4 - 8 INCH STRAP HINGES.
6 - 1" x 10" - 28" - " - SLIDES	4 - IRON ROLLERS.
4 - 1" x 10" - 39" - " - COVERS	4 - 3/8 INCH BOLTS (WINGED NUTS & WASHERS.)

THE IOWA SELF-FEEDER

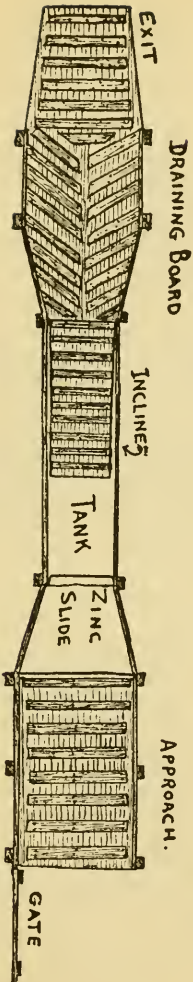
shelled corn it need not be inclined so much. To prevent rooting of the grain from the troughs, it is advisable to place upright vertical slats or rods about 10 to 18 inches apart, depending upon the size of swine. To make these rods adjustable, bore holes in the front baseboard and in the top front one, about 6 inches apart, and drop the rods down through these holes at the desired distances. The boards should be made of 2 x 6's rather than 1 x 3's, and the holes can be placed at 2, 3, 4 or 5 inch intervals, to assist in adjustment. When boring the holes in the lower baseboard, extend them only about 2 or 3 inches to give the rods a stable base and prevent falling through.

“The cover should project out over the front feeding space to protect the exposed grain from the weather, especially rains and snow. It is advisable to keep these feeders under shelter, in the winter as well as in the summer, all being imperative if best results are to be secured.

“The Iowa self-feeder (large double way) is designed to give considerable capacity, and furnish more trough or feeding space. The slides are removable, being made to slide in grooves. The front groove cleats inside of the outer walls can be replaced by the small wheels as in the single way feeder, or with small, short blocks. These little wheels or blocks give better satisfaction than the continuous cleats, because the grain (especially if ground), which tends to lodge in the groove, falls right on through into the feed box rather than to clog and gum up the slide. The roof should extend from 14 to 18 inches out from the perpendicular side of the feeder, to prevent the feeding material being damaged by rains and snow. The inverted V-shaped trough in the bottom of the feeder facilitates and encourages the movement of grain through the openings at the lower portion of the



Side View



Top View

DIPPING TANK

slide. In general, the details of the feeder are similar to the small type.

“The floor is made out of hard wood, but yellow pine or fir answers the purpose very well, 2-in. stuff being preferable. Swine tend to eat out the white pine too readily. Sheet iron works well to cover the lower portion of the trough. To further protect the grain from the weather, a hanging apron of sheet iron is used, hinged at the top of the feeder, swinging free below and just clearing the front baseboard of the trough. This apron facilitates the ‘cleaning up’ of scattered grains, as the pig is to eat that grain which is in sight rather than to open the ‘cupboard’ door.”

There are several different types of galvanized and wooden self-feeders manufactured that are highly recommended. The essentials of choice are durability, simplicity of construction, operation and provision for the sanitary keeping of foods.

CHAPTER XXXIX

DISINFECTANTS, ANTISEPTICS, GERMICIDES, DIPS, ETC.

THE frequent and thorough disinfection of all buildings and premises is a great factor in maintaining ideal sanitary conditions on the hog farm. It is one of the best safeguards against ravages of disease.

Germ antagonistic agencies vary greatly in form, strength and usage. Parasitocides destroy all forms of parasites outside the body. Disinfectants destroy germs outside the body. Antiseptics prevent germs, germicides destroy any germ and a deodorant destroys bad odors. The true disinfectant is a combined disinfectant, antiseptic and deodorant. The germs of hog cholera, canker sore mouths, tuberculosis and arthritis demand the use of the strongest disinfectants.

The most powerful and effective commercial germicide is corrosive sublimate. A solution of this, 500 to 1, in water, sprayed or sprinkled over the infected premises is destructive to all forms of germ life. Carbolic acid of 1-1000 solution will destroy germs, but is very irritating. Commercial dips, as cresol and crude carbolic acid, rank next in power of efficiency. Three to five per cent solution of cresol dips prove very effective. Use the best standard dips, as the cheaper ones lack in the effective agency.

The liberal scattering of slaked lime over the premises, buildings, feeding places and in watering troughs destroys much of germ life and establishes considerable

assurance of protection. Commercial lime is used to purify water or mud holes. Water-slaked or hydrate of lime is made into a whitewash and sprayed or painted in buildings or scattered dry over the premises. One pound of chloride of lime to 3 gallons of whitewash increases its efficiency. The low cost of lime and its general practicability recommends its use, and it also acts as a corrective of indigestion in lime water and air slaked forms, and the inhalation of lime-dust has a curative effect in many minor lung troubles.

Blue vitriol, or copper sulphate of 3 to 10% solution in water sprayed over premises, is a reliable, cheap disinfectant and deodorant besides a good antiseptic and internal destroyer of the necro-bacillus germ that causes canker sore mouth and intestinal ulcers. About 10 grains may be given internally, twice daily dissolved in the feed.

Crude oil can properly be considered as a disinfectant, with the addition of a small per cent of some standard disinfectant or dip. The cheapness and method of application commend its use by many hog men, especially for lice and skin diseases. However, its high carbon content makes it dirty and objectionable. Any low cost lubricating oil will serve better. Medicated oils, used in hog oilers, are the most economical and effective for general year round usage on hogs of all classes.

The standard dips are produced in both liquid and dry forms, the liquid being preferable for summer use, and the dry dips for winter use. Liquid dips may be used as a spray or by total immersion in a water solution. The cost of most liquid dips makes their general use expensive, but there is danger from colds and pneumonia during inclement or winter weather. Dry dip is a powdered combination of disinfectant elements. It is applied by being thrown directly over the hogs and in their nests, yards and on feeding floors. Animal heat

causes its evaporation, which proves fatal to parasitic and germ life. Its inhalation is also recommended for minor lung troubles.

It is advisable to use some form of disinfectant frequently wherever excrement, filth or litter accumulates. Give everything a good soaking, especially during and after infectious diseases. The slop barrels, swill pails, feeding troughs, floors and all corners, cracks or catch places where hogs are in the habit of being, should be given thorough cleanings and disinfection at least every 2 or 3 weeks. All mud holes and water holes should either be filled up or kept thoroughly soaked with lime or other disinfectants.

One of the best safeguards against carrying probable infection is a "foot disinfecter." Every hog man should install one on the farm, as it is easily made and maintained. A flat, trough-like receptacle constructed of any material that is water tight, the dimensions from 1 to 2 feet square, 1 to 2 inches deep, with one or more burlap sacks tacked over the bottom, frequently saturated with dip, makes a dependable place to wipe your or the neighbors' feet every time of entering or leaving the hog yards.

Chloride of lime can be used separately or with lime. It is a good deodorizer besides a disinfectant. For use alone, dissolve 1 lb. in 3 gallons of boiling water, and spray or whitewash with it. It is very effective to destroy germs and flies of the farrowing pens, manure piles, decaying matter, dead animals, etc., and to keep the air sweet and pure. It is used extensively in cleaning up foot and mouth infected premises, also hog cholera, necrobacillosis, etc.

Sulphur is used in the fumigation of hog houses; the building is vacated and kept closed for 24 hours afterwards. Five pounds of sulphur is generally used for every 1000 cu. ft. of air space.

The vapors of formaldehyde or formalin, oil of eucalyptus and permanganate of potash are sometimes used to treat hogs affected with lung troubles. The method employed is by placing $\frac{1}{2}$ lb. of the latter and 2 oz. of eucalyptus in a metal pail that sets in a vessel containing water, then pour in a pound of formalin and get out of the tightly closed hog house that contains the hogs to be treated, as the fumes are irritating and suffocating. The operators, numbering at least three or four men, should wear gas masks, and be full of courage and energy, to go in repeatedly and drag out both overcome men and hogs. The treatment is rather too heroic for general practice, except to fumigate buildings.

Copperas, or iron sulphate, acts as a disinfectant and antiseptic. Two pounds of copperas dissolved in 2 or 3 gals. of water and sprinkled over the premises will destroy low form germs and deodorize. Not over 15 grams should be given internally to destroy necro-bacillus germs or other similar or low form germs. Its iron content acts as a tonic, but over dosages become very harmful.

Peroxide of hydrogen can be used freely locally on sore mouths, teats, etc.

Combustion or fire, at above 300° Fahr. or dry steam from 230° to 240° for a short period, will destroy all forms of germ life, and make sterile, as will boiling at 212° Fahr.

DIPPING HOGS

Specially constructed tanks or vats of cement or galvanized iron are used to dip hogs. The dipping tank is generally of approximately the following dimensions: 8 to 12 feet long, 3 to 5 feet deep and 18 to 24 inches in width in the clear. The open or top of the tank should be slightly above ground level. The tank should have side fences, a chute leading to the trip platform, which

drops the hog into the tank, an incline for hogs to get out, and a draining board to divert the greater part of the dripping solution back into the tank.

Water is the base of the dipping solution, being approximately 96% water and about 3 or 4% Cresol Dip, or Liquor Cresolis. Medicated or crude oil covering the water about 1 inch is also used. Any good standard dip will give satisfactory results. The essential thing is to completely immerse, but for a moment, and remove.

The insides of the pig's ears should be swabbed with a rag dipped in the solution to reach the lice harboring there, not always reached by the dipping process. Hogs should be dipped at least every 30 days during fair weather. It is not advisable to dip during the winter months. This practice is the frequent cause of colds, pneumonia and lung troubles.

HOG OILERS

Various types of cast or malleable iron mechanical devices are quite extensively used to apply disinfectant oils direct to the hog's body. The essentials of a good oiler are simplicity, durability, adaptability, effectiveness and economy. The working principles of the popular types embrace the cylindrical, wheel, ball, post and valve. Each has its own peculiar merits over others and likewise objectionable features. In selecting a hog oiler, the simpleness of operation, low wastage of oil, the use by all hogs, the applying of oil to any point on the hog, the usage of any kind of oil and during all kinds of weather, should be reckoned carefully.

Medicated oil having high grade parafine oil as the base, with a proper amount of some strong disinfectant agency, gives best results in hog oilers, as it spreads farther over the body, livens up the skin and coat, destroys all parasitic troubles and is cheaper eventually

than the crude oil preparations, which usually contain an excess of carbon and have a tendency to smear, catch dust, give the skin and coat a very dirty appearance and become clogged in oilers in cold weather. Neither are they as effective as medicated oil for any purpose or use upon hogs or premises.

SPRAYING HOGS

Disinfectants may be applied directly upon the hog's body by spraying, sprinkling, using brooms, brushes or cloths.

In spraying, certain types of hand force pumps are used; the most common being a low priced single valve, brass tube pump with a hose and nozzle attachment. A cheap, tin spray pump is also used. The base of the spray solution is water, being approximately 96% water and 3 to 4% of some certain prepared cresol dip.

The hogs are confined in small pens and thoroughly sprayed with solution at least every two weeks to keep down lice and parasitic infection. The same solution may be applied with a sprinkling can, broom, brush or cloth. Spraying is handier, saving labor and time. Medicated or crude oil can also be applied. Neither dip sprayed nor dipped hogs should go directly out into extreme cold, but should dry gradually in their quarters.

To aid in keeping down dust and destroying parasites in the sleeping and feeding quarters of hogs, it is advisable to frequently go over these premises with a sprinkling can of medicated crude oil, following later by scattering air slacked lime.

To clean up bad infections, a chloride of lime solution, 1 pound to 5-10 gallons, dissolved in boiling water, sprayed a few times over premises and quarters is most effective, but do not spray hogs or allow them to come in contact with quarters for several hours.

CHAPTER XL

HOG REMEDIES, STOCK FOODS AND POWDERS

YEARS of experiment and investigation do not find proof for all of the so claimed efficiency of widely advertised compounds to prevent or cure serious diseases, especially hog cholera. Hogs, like mankind, when bred, fed and cared for rightly, have little need for drugs or "dopes." The ailments and diseases affecting hogs are very similar to those of the human family, in fact the diagnosis and treatment can be made and applied almost identically for both.

The facilities for treating hogs strictly hygienically practically make unnecessary the wide use of medicinal elements. Combinations of tonics with other natural food elements usually give fair results as a tonic and an appetizer, and to some degree in the prevention of ailments and disease. However, the nature of treatment and cost of many such compounds practically prohibit recommendation and use. Furthermore, it is quite commonly believed that the continual dosing and doping of pigs with drugs and "dopes" from early pig-hood to maturity is accountable for many later "back-setting" troubles.

While many stock powder compounds do contain elements of value and good effect, they may also contain certain elements of which the herd as a whole has but little or no need, consequently every dose of such ele-

ments given to the herd in common generally produces harmful results in the hogs that have no need for the dosage of "dope," as they, having good appetites, usually eat the ailing hog's share besides their own. Perhaps the best method to adopt is to base the use of such compounds more upon their value as appetizers, neutralizers of digestion and condition, and to avoid the use of strong drugs or dopes until there be a positive need for them, and then to use them sparingly and follow up with a system of feeding and care that will minimize much of the harmful effects.

Vermifuges or wormicides are recommended for worms, as are certain drugs for many acute or chronic ailments, but the better way is to feed and care for the hogs in such a manner as to prevent the greater part of such troubles. Nature intended that man and animal life should secure the greater part of medicinal elements needed from the foods they consume. Man abuses not only himself in this respect, but also forces his hogs to be deprived of many foods and habits that they would naturally use, and persists in attempting to substitute, with a dependency upon "dopes." Hence the encouragement of a wide and varied business in the manufacture and sale of hog remedies, stock foods and powders. Many of these remedies are sold under all kinds of guarantees similar to those for humans. Some men are so unscrupulous as to go into a contract to effect the cure or prevention of hog cholera if the hog producer will use several hundred pounds of their "dope." The seller usually secures a note for at least \$1.00 per head treated, which he cashes, and the farmer can hold the sack, for all the alleged contract or "dope" is worth.

Many hog men secure good results from the continued use of hog remedies, stock foods and powders, while many secure only an indifferent or harmful result, not

so much from the nature of the ingredients of the mixture as from lack of observation and practice of when and how to feed. In fact, the indiscriminate practice of "dumping" the mixtures into well and ailing alike, "gorging" today and "starving" tomorrow, or "overdoping" for many days in succession, is bound to produce bad results, even with the most harmless of mixtures. For example: charcoal, ashes and salt are very beneficial to hogs in correct amounts and at regular intervals, but can be made to produce harm in continued overdoses, in fact salt will soon become a poison, lime an irritant, charcoal an astringent and ashes a caustic.

Homemade mixtures can be made at a low cost, and can be of high efficiency with but little labor. Every farm has an annual surplus of wood, such as discarded posts, broken boards, timber and brush, along with corn cobs and other debris of the farm yard. These materials can be collected into piles and either burned into ashes or charred into charcoal. With a good supply of this base, the following mixture can be effected at a cost of a few cents per pound:

Vegetable or wood	Common Soda	5 lbs.
ashes	Sulphur	5 lbs.
50 lbs.	Common Salt	5 to 10 lbs.
Charcoal	Gentian (powdered) ..	2 lbs.
15 lbs.	Saltpetre	3 lbs.
Lime		
5 lbs.		
Glauber salts		
5 lbs.		

and 2 lbs. of Copperas or Sulphate of Iron may be added if desired.

It is not essential to adhere strictly to the exact poundage or all the ingredients in this formula, so that it has ashes, salts, charcoal, lime and sulphur in it.

"Wormicides" and "germicides" can be fed separately with but little harm, if the directions are carefully followed. The better way is to underfeed rather than overfeed, and in all cases do not feed them continu-

ously. Some hog remedies, tonics and powders may contain desirable elements of nearly correct proportions. But such should never be made the basis of the hog's feed, nor any great part of it. Some breeders seemingly do this believing that it is impossible to raise pigs without "dope" of some kind.

The cardinal principles of hog production are to first "breed them right," then "care for and feed them right." This means to keep them strictly sanitary, feed them well balanced rations high in blood, bone, nerve and tissue making elements, with the occasional feeding of medicinal elements that they may show deficiency in or need of, and not to make the hogs the "dumping ground" of all the innumerable products manufactured to cure the ills of hogs. The many state experiment colleges find very little benefit from the use of stock powders or remedies. In fact many experiments show that the stock foods or powders are often detrimental instead of beneficial.

TO CHAR WOOD OR COBS

All refuse wood, as old posts, poles, etc., of the farm may be easily converted into charcoal by the following method.

Dig a hole into the ground, on a hillside if possible, three feet deep and five or six feet across, or to fit the length of wood, and put in a grate made of an old section of a steel harrow, or of old iron wheels, or iron bars, anything to cover the bottom, with an 8 or 10 inch ash and air space underneath. Pile in the wood closely together conically, leaving an air space up through the center. Cover the top of the wood with a few inches of straw and then with dirt, leaving only the draft hole in the center open. Then set fire at bottom under grate, through tunnel of hillside or with kerosene and shavings through the top

and let burn until very red, then close up top draft with dirt and exclude all air. The heat will smolder the wood into charcoal, excepting a small amount of ashes that falls through the grate.

Cobs may be charred in big piles on the ground by first firing them to an almost cherry heat, then quickly covering with dirt, excluding the air. The smoldering will convert much charcoal. A few pounds of salt added will increase its palatability and value for hog feeding.

CHAPTER XLI

WORMS

Most hogs have worms, especially during the early period of their lives. Pigs are usually infected during their suckling and weaning period. Worms are of less number and effect in pigs merging into hoghood and in matured animals. Oftentimes when matured hogs are slaughtered, hundreds of worms are found in their intestines without marked outward symptoms of their presence. Pigs may also have a few without showing much effect.

The harm produced by intestinal worms in young growing pigs cannot be estimated too high; perhaps 50% of the prevalent serious and fatal pig ailments can be in some manner attributed to the presence of worms. Worms suck up or absorb much of the nutrient materials in the intestinal tract that are in the process of assimilation. Hence worms are robbers of a goodly portion of the pig's food. The presence of many intestinal worms also tends to render the balance of ration and amount fed ineffectual. Young pigs simply cannot eat enough nor have the capacity sufficient for the sustenance of both self and countless numbers of worms. Worms must be prevented and eradicated to make pig raising safe and profitable.

The origin of intestinal worms is generally attributed to unsanitary quarters.

ROUND WORMS

Pigs are infested by several different kinds of worms, the large round worm being the most common one. They naturally infest the smaller intestine, and when found elsewhere the lack of space for numberless worms and of food therein has forced them to seek a newer location. Round worms are yellowish white or a pinkish white in color, transparent, smooth, elastic and filled with minute thread-like entrails. The adult males rarely exceed 8 inches in length and the females range from 8 to 12 inches. The bodies are smooth and round, of about the thickness of a slate pencil, tapering at both ends. They breed in the pig's intestines, the female laying eggs which pass out in the excrement and are deposited variously over the pig's premises. The worm eggs are not discernible to the naked eye, being only about one four-hundredth of an inch in length. They find ideal lodging places in filthy quarters, mud holes, stagnant ponds, manure piles and warm, moist, shady places, where they are consumed by the pig rooting in, eating food and substances, or drinking water that is contaminated. The necessary temperature to propagate occurs in the pig's stomach and the embryo worms pass into the smaller intestines, where in a few days they become tiny thread-like white worms, and in the course of a few weeks adult of size, breeding and laying worm eggs.

SYMPTOMS

The symptoms of wormy pigs vary in nature and degree according to the number of worms and accompanying ailments. Pigs that are badly infested are very unthrifty, the coat dead looking, rather pot-bellied in appearance, often a cough, affected with acute or chronic indigestion, diarrhea or dysentery, extreme restlessness,

morbid appetites, itching of the anus, and occasionally nervous disorders and fits. Close examination may find parts or whole worms in the pig's excrements. Post mortem examination reveals that in severe cases, bundles or ropes of worms are found in the smaller intestines that almost completely obstruct the passage of digesting foods. Also there is a slimy substance coating the intestinal lining and putrid fecal matter.

The presence of many worms sets up inflammation of the inner lining of the intestines, and a few worms may work their way up into the liver, clogging up the duct, impairing its natural functions, and eventually causing serious ailments. It is practically impossible to dislodge worms from the liver even with the strongest vermifuge. Round worms are sometimes found in the stomachs of dead hogs shortly after death. This happens through a reverse action of the intestines during the death period. The action of the digestive juices of the stomach is antagonistic to the presence of round worms, especially the alkalinity.

TREATMENT

The common prevalence of worms in hogs, especially during the summer months and in pignood, makes it advisable to feed almost continuously some low form vermifuge to eradicate and to keep worms under control, or to give an occasional cleaning out process.

The best method to prevent worm infections is keeping the premises sanitary, using disinfectants freely and feeding the pigs a good worm preventive, as common wood ashes (from its lye content), charcoal, slaked lime, copperas, common salt and sulphur, fed in self-feeders or places so arranged that the pigs can have free access. Worms may develop in numbers, despite this mixture, until it becomes advisable to give the pig stronger vermi-

fuges. Santonin and calomel combined are the most efficient and dependable, also the most expensive. The dosage is 3 to 5 grains of santonin and 4 to 6 grains of calomel to every hundred weight of pigs.

In giving this treatment, the pigs should be held off feed for twelve hours. Dissolve the santonin and calomel in hot water, and mix solution into a slop food, pour into troughs and let the pigs line up in bunches of 10 or 15 in order to secure an even start and probable amount. Santonin alone can be used in doses of 6 to 8 grains to the pig. Always follow santonin a few hours later with a good physic of Glauber or Epsom salts. This treatment should be repeated in a week, if good results are not secured.

Areca nut, levant or German worm seed combined in teaspoonful doses to the pig is also effective against intestinal worms. Santonin and areca nut in combination is another effective vermifuge, a good formula for each 50 pound pig being:

Santonin	3 to 5 grains
Calomel	1 to 2 grains
Areca Nut	1 dram
Sodium Bicarbonate	$\frac{1}{2}$ dram

In dosing 75 to 80-pound pigs, increase about one-half, and double the dose for 100 to 125-pound pigs. Follow up twelve hours later with a physic of Glauber salts or Epsom salts. Repeat dosage in eight to ten days, if results are not satisfactory.

There are several good commercial worm remedies, but many contain harmful elements, especially when fed excessive or too often. Many hog remedies contain good vermifuge elements when fed correctly. Excess in dosages of carbolic acid, concentrated lyes, copperas, san-

tonin, areca nut and other poisonous or irritating elements should be avoided in worm treatments. In treating for worms, all pigs should be kept off feed for at least twelve hours previous to giving the vermifuge agency.

A few drops of turpentine in slops or wet foods usually gives good results in the destruction of all forms of intestinal, lung and kidney worms.

All worm treatments should be accompanied with a general clean-up and disinfection of premises. The feeding rations should be of a light laxative nature during the treatment, gradually increasing to full rations afterwards.

For a worm preventive, mix up the following formula approximately as given, and keep it before the pigs in self-feeders, troughs, or boxes in sheltered places.

Wood ashes	6 parts
Copperas	2 parts
Lime (air slaked).....	3 parts
Sulphur	1 part
Charcoal (any kind)....	3 parts
Salsoda	1 part
Common salt	2 parts
Glauber salts	2 parts

(The Glauber salts may be left out to lessen the physic effect.)

This mixture should not cost over 3¢ per pound, and is highly beneficial in balancing the pig's ration in mineral matter; it promotes growth of bone, enriches the blood and aids digestion.

THE PIN WORM

This is a very small grayish white worm, about one-half inch in length, pointed at both ends. It is com-

monly found in the forepart of the large intestines. However, the pin worm does not produce much marked effect locally or in the general appearance or thriftiness of the pig. Pin worms mingle mostly in the excrement, clinging along the intestinal walls to avoid elimination through the rectum and anus. It is believed that their presence in numbers contributes greatly to other intestinal and parasitic troubles. The same treatments as recommended for round worms should be given to prevent and eradicate pin worms.

THE THORN-HEADED WORM

The thorn-headed worm is a creamy or milky white. The females are about 11 inches in length, while the male rarely exceeds three inches. The body is cylindrical, tapering to the tail, having a blunt-like head, armed with rows of hooks by which it hangs to the walls of the intestines and forces its way through the walls, tissues and other organs. These worms may prove fatal when present for any length of time. Usually not over one-half dozen are found in post mortem examinations in either the small or large intestines. They are sometimes found in the liver.

It is believed that hogs eating white grub worms which have devoured the voided eggs laid by the female worms in the intestines of affected hogs, become re-infested with thorn-headed worms. This is very probable, as the eggs discharged in the excrement become scattered over the premises, a great number finding lodgment in manure piles and vicinities wherein grub worms find favorable places of development. The hog's natural inclination to root and turn over everything with his nose, and eat of both organic and inorganic substances explains largely how the grub worm with its encysted, thorn-headed worm egg secures entrance into the pig's stomach, thence to

the small intestine, where it develops into an adult-sized worm, breeding and laying eggs.

The symptoms of the presence of thorn-headed worms do not differ materially from those of round worms, excepting when badly infested. Post mortem examinations of affected pigs reveal three to one-half dozen worms with their heads buried in the walls of the intestines, woven into the liver or into other intestinal parts. There may be also markedly red and inflamed spots in the tissues of the intestinal walls. These spots are usually about one-fourth of an inch in circumference, depressed slightly in the center, and varying in degree of inflammation according to the recentness of attachment.

The treatment is practically the same as for round worms. Keep the hogs away from straw stacks, manure piles, etc., plow up the yards and disinfect with chloride of lime. Turpentine in teaspoonful doses to each hundred weight of pig may also be given in the feed for two or three mornings, after keeping the pig without feed for twelve hours previous. This should be followed by a physic of castor oil or Epsom salts.

THE WHIPWORM

The whipworm is not a commonly found hog worm. It is about one and one-half inches long, shaped somewhat like a whip. It is usually found in the forepart of the large intestines with its head attached to the lining of the intestines. While whipworms do no great harm, they may set up irritations and aid in causing complicating troubles. Whipworms gain entrance into the pigs in much the same way as do round worms, and in about four weeks become adults, reproducing self by breeding and laying eggs that pass out in excrement, to later infect other hogs. Whipworms are removed by practically the same treatment as for round worms. Clean up and

disinfect the premises and keep a low form of vermifuge before the pigs, such as wood ashes, copperas, lime, sulphur, etc.

THE KIDNEY WORM

The kidney worm is occasionally found in tissues or fats about the kidneys. Many hog men erroneously believe kidney worms are the primary cause of paralysis of the hind parts, weak back and other similar troubles. Research to date does not find confirmation.

This worm is of a dark mottled color, the body is round and tapers to the tail, and has a blunt-like head. The females average from one and one-half to two inches in length, and the male is about one-half inch shorter. They are usually found in the passageways that they have worked through the kidney fats and tissues. Only two or more are usually found in a pocket or cavity. Their activity, so far as known, causes only local irritation and inflammation that sometimes affects the natural offices of the kidneys and in some cases forms pus or abscesses.

Their presence cannot be definitely detected by outward symptoms, the only sure determination is by a post mortem examination. It is believed that their cycle is very similar to that of intestinal worms, the eggs being passed out with the urine, entering the hog's bodies through the source of foods, and finally reaching their natural place of habitat — the tissues around the kidneys.

The treatment is mostly preventive, as the diagnosis at the best is only suppositional. Light doses of turpentine given in slops for a few days has a good effect. Saltpetre or nitre also has a direct action on the organs of the urinal tract. Keep a salt and ash combination in daily free access. Clean up and freely disinfect quarters and premises.

CHAPTER XLII

THE HOG LOUSE

THE hog louse is the most harmful common parasite preying upon hogs. It may be rightfully termed as a "blood sucker" and "sapper" of vitality, and as a "robber" of a large per cent of the nutrient of the hog's daily feed. Next to the common round worm, the hog louse secures the largest amount of life-making elements from the hog's body. Perhaps 10 or 20% of all nutrients that the pig consumes daily is sucked up from the blood by the hog louse, when the pig is badly infected.

The hog louse is of such common occurrence that a detailed description seems unnecessary. However, the adult louse is a small, flat, oval bodied, tough shelled parasite about $\frac{1}{8}$ to $\frac{1}{4}$ of an inch in length, of grayish color, equipped with a long shaped head, a powerful proboscis especially adapted for penetrating the skin and sucking blood. Six legs are attached to the fore part of the body, three on each side.

The hog louse is commonly found attached to the skin, back of and in the ears, under the jowl, behind the lower part of the shoulder, in the flank and under lower part of the ham, and around root of tail. It attacks the thinner parts of the skin and protected places, and in wrinkles and depressions are found the eggs attached to the hairs. They are yellowish white in color, oval, egg shaped, covered with a very tough shell that protects them against destruction and common disinfectants until they hatch

out, which takes place from 5 to 15 days later, according to temperature, favorableness of conditions, etc.

Hog lice produce more harm upon young, thin skinned pigs than upon older hogs, as the pig is more tender and delicate and offers the louse the least resistance. The pig requires more of the essential life and body building elements than do older hogs, in fact, pignood is a critical period of the hog's life, and the ravages of any parasite or disease during this time rob it of its natural requirements of the basic life and body building elements, stunts its growth, lessens its vitality, lowers its power to resist disease and ultimately affects the final pork results and profit.

Hog lice also cause considerable irritation to the skin by puncturing it repeatedly to insert their blood sucking mouths. This is further augmented by the affected hogs incessantly rubbing and scratching, thus offering a chance for inflammation and infection, resulting in such skin diseases as scurf, scale and mange. The hog louse is also a recognized agent for carrying infectious diseases from hog to hog and farm to farm, especially hog cholera.

Lice infected hogs are generally denoted by marked unthriftiness, harsh dry coats, scaly, scurfy skins and stunted growth. It is commonly reputed that the hog louse will absorb enough of the nutrients that the pig secures from his daily foods, especially in bad infections of extremely young pigs, to cause him to be badly emaciated and finally so weakened that he may die, and when both lice and worms are combined, the pig's power of defence and state of vitality are so weakened that he is very susceptible to ailments and disease. Hence the importance of lice and worm eradication, for regardless of how well the ration or feeding of the pigs may be, if lice and worms exist, a good per cent is being wasted.

Cresol dips will not destroy lice eggs, as its killing

agency evaporates with the water in a few hours after application. Crude oil or any kind of oil or grease is more effective, as the oil will completely coat the egg airtight for several days, and as the louse breathes through the pores of its body, the oil will smother it and destroy the majority of the newly hatched lice. Another application in a week or ten days will effect complete eradication. Hence, the efficiency of oil rubbing posts and hog oilers.

TREATMENT

Hog lice will crawl or fall off of hogs and secrete themselves in the bedding, dust or crevices of the sleeping quarters. Eggs are rubbed off and later hatch out in the sleeping quarters, so they should be frequently treated with disinfectants, as lime, cresol dips, dry disinfectants, crude oil, kerosene and medicated oils.

Prevention is the basis of treatment. Various methods are used to prevent and destroy lice infection; the most efficient and common ones are here given.

Spraying. A three or four per cent solution of some standard cresol dip is sprayed with a force pump over the hogs collected together in small pens. To be efficient this should be repeated at least every 10 days. The objections are that the dip does not reach lice in the ears, and is liable to give the pigs cold during inclement weather.

Dipping. Either a three or four per cent solution of cresol dip or oil of some kind is poured into a dipping tank, vat or barrel, and the pig is completely immersed for a moment and then removed. The objection is the liability to give colds or pneumonia during cold weather.

Wallowing vats or wallowing holes. Crude oil, cresol dips, kerosene or other oils are poured into especially constructed concrete shallow vats, or into mud or water

holes, and hogs allowed free access to wallow in them. This is effective especially during summer months, but impractical during the late fall and winter season.

Rubbing posts and hog oilers. Hogs seemingly have a natural tendency to rub and scratch their bodies against any object that has a blunt projecting surface, to relieve irritation of the skin caused by hog lice, mange, scab, etc. Hence the popularity of hog oilers and rubbing posts. No attempt is made to recommend any certain make, all have good and bad features, but their basic principle is much the same; a container to hold and supply the oil economically and a scratching rubbing surface always loaded with oil, arranged so as to be inviting for the hog to use and workable in all seasons and under all conditions, are the chief features.

The self-oiling method is the best all the year round lice and skin disease preventive and eradicated, as it can be used winter and summer without danger to health, and it permits the pig to be its own doctor. This system might be termed "the free choice system of parasite prevention." However, oilers and posts have a few objections; mud will collect and clog up oilers, the mechanism will get out of order, and they have to be filled and looked after frequently.

A few lice killing preparations are good and some of these are:

Kerosene emulsion, used either as a dip, sprayed or applied with a brush. Kerosene, 2 gallons, 1 bar of laundry soap, a 5¢ plug of tobacco and 1 gal. of water. Boil the water, soap and tobacco together for 20 or 30 minutes, remove and then add kerosene, stirring the mixture until emulsion takes place. Sufficient water is then added to make 15 or 20 gals. Allow it to cool before applying.

Crude petroleum emulsion. One gallon of water

placed in pot or receptacle over fire, add one pound of finely shaved hand soap dissolved thoroughly in water. Then add 4 gallons of crude petroleum, mix thoroughly by churning, shaking and stirring. When thoroughly mixed add sufficient water to make 20 or 25 gallons of diluted dip. Soft water should be used when available. This may be applied with a spray pump, broom or brush, or used in a dipping vat. Sal soda will soften hard water.

The amount of cresol dip used either in dipping tanks, wallowing vats or with spray pumps should not exceed 4% of the water solution. The efficiency of cresol dips is aided by the mixture of an equal per cent of a good grade of lubricating oil. The amount of crude oil or petroleum used in dipping tanks or wallowing vats should be sufficient to cover the water, not to exceed one-half ($\frac{1}{2}$) inch; the better method is to barely scum the water over and replenish often. The use of crude petroleum in hog oilers and rubbing posts is made more efficient by thinning its thick consistency with kerosene.

FLEAS

In some sections the common flea infests hogs and their quarters. They breed in filth and favor dusty, sandy accumulations under sheds in houses. Their cycle of life from birth to adult size is about 30 days. They belong to the parasite, blood sucking family and cause the infested animal both annoyance and loss of life elements.

Treatment: Clean up and establish sanitary premises. Use cresol or medicated oil dips on both hogs and their quarters frequently.

CHAPTER XLIII

PIG EATING SOWS AND CHICKEN EATERS

THE seemingly unnatural desire and craving of hogs for animal flesh, especially for live pigs and chickens, is of primitive instinct, and instituted largely by incorrect feeding. Hogs in their primitive habitats had opportunity of securing and devouring some tender flesh. These habits made the hog omnivorous by nature, but the plan of domestication by mankind has been to supply grain and forage in substitution, which contain certain elements somewhat similar to, but in reality are not, flesh, the proteins, mineral matter and fats being in plant instead of animal form. Whenever the ratio of these elements is below the requirements of the animal, especially that of brood sows or growing pigs, rations which have a greater supply of protein and mineral matter are needed, and it becomes natural for them to seek to supply the deficiency. The first or easiest flesh to be obtained is chosen regardless of cost, as the hog is not an economist, neither does he respect religion or pedigree, as is evidenced by the cannibalistic tendency to devour his own offspring.

Brood sows that have been suckled by large litters of pigs or that have been starved in the needed elements crave flesh and mineral matter and they will eat readily, either little pigs, little chickens or older chickens, more from the fact that they are the first forms of animal life to present themselves. The practice of allowing chickens to run with the hogs and the feeding of the herd, espe-

cially the brood sows, excesses of fattening foods with lack of mineral, muscle building foods, explains the whole trouble. If once the sows taste the flesh of chickens or little pigs, they become regular "demons" and "hunters," especially for chickens. Some old "chicken eating" hogs will stand on guard like a pointer dog and chase chickens like a dog would a rabbit.

The treatment or care is largely preventive. The causes must be first removed, the animal placed in a chicken tight enclosure and fed rations high in protein and mineral matter. Tankage, meat scraps, charcoal, wood ashes, air slacked lime and iron should be given freely. This usually restores normal appetite in 3 or 4 weeks.

Pig eating sows also acquire the habit from fever and irritation resulting from difficult farrowing and udder troubles. The treatment is to remove the pigs between intervals of suckling and to feed the mother liberally on meat scraps, tankage, etc., for a few days, with care not to cause scours in pigs. The feeding of dry salt pork or pickled pork is also recommended, as the mineral matter of the salt and the flesh oftentimes diverts or satisfies the craving. In event the animal shows a confirmed habit, it is best to dispose of it at first opportunity, before other hogs get the habit.

CHAPTER XLIV

FITTING AND EXHIBITING SHOW HOGS

SUCCESSFUL attainments by the leading breeders and show men of the different breeds of swine commence primarily with good selection and constructive breeding followed by judicious feeding and care, coupled with an inherent love of caring for and producing animal life in its highest ideal form and finish. The type ideal and general conformation of a breed depends largely upon the practical experience determined by its leading breeders and feeders. The show ring serves as an advance exhibition of the highest finished forms of all classes of the breed presented for open criticism and approval by the world at large. The stimulus of competition and the awards of merit coupled with the approvals and criticisms of practical hog men, followed latterly by actual tests in the breeding, feeding and market pens, go far to establish a breed and type upon a sound business basis.

Practically every breed has experienced a period of depression in general utility within the last generation or so, largely brought about by breeders and show men attempting to define and produce a more fanciful form than that which the practical hog producer found to be of better ideality and general utility. This type is sometimes erroneously termed as the show yard type. Properly speaking, such is "the fancy" or "boomer's" type, grown by the raiser who abuses and attempts to use the show ring awards and printer's ink to create popularity

and make "easy, big money," in fact being in the game more for love of finance than of individual merit and breed.

The true "show type" is that which possesses the highest ideality of general fitness and utility for the breeder, feeder and farmer to use as a means of ultimately fulfilling the market demands of packers and consumers of pork products. This means the type possessive of great scale with considerable refinement; possessive of a strong constitution, vigorous, high power of disease resistance, prolific and of a long line of heritage, which means their blood lines trace back strongly and many times to noted and prepotent ancestry. The intended show animals must possess marked evident quality and give promise to acquire the bloom or show yard finish at about the opening time of the fair where the animal is to be exhibited.

FEEDING SHOW HOGS

The fitting and feeding of hogs differs but little from that of ideal fattening. From personal practical experience of a lifetime and from that of other most successful show men no certain fixed rule can be given by which to fit and feed all individuals and classes of show hogs.

Boars are the most difficult to handle and properly fit, as most intended show boars are inclined to follow the bent of their natural usefulness, rather than resignedly paying a fattening attention to food. Hence, after a boar reaches sexual maturity he becomes an individually complex problem to fit and feed for show. Broadly speaking, aged boars do best segregated in small individual pasture lots provided with plenty of forage, water and shade. Corn, two and three times daily, with short slops and separated milk, night and morning, forms the basis of food. This should be balanced in both amount

and ratio as near ideal as possible to conform with the hog's appetite and need, slightly increasing the fattening balance until practically on full force feed of corn. Milk besides being an appetizer builds bone, body and with a few eggs, tankage or oil meal coupled with succulent pasturage perfects the bloom finish.

Daily exercise is most essential to keep the bone firm; to lay flesh and fat evenly; to keep appetite, digestion, absorption and elimination perfect. The wind of the animal, carriage and style, disposition and tractability of handling in the show ring must be ideal. The latter are oftentimes the balancing points to decide close contests. To effect greediness and full appetite of yearling and aged boars, younger male pigs or barrows are fed with them. Yearling and senior yearling boars are more easily fitted and handled than aged boars, while those intended for under a year show if kept in bunches or of too close proximity to sows or if allowed to serve sows become "ranters," refusing to eat only a maintenance ration. Such individuals should be placed with barrows or discarded entirely.

Not more than two or three fall boars should be fed together for show and then the ration from pignood should be of a high developing nature forming into a full fattening one. Milk or tankage or short slop in connection with forage or pasturage should be supplied daily. The feeding of six months boars and gilts is but that of ideal pig feeding,—milks, shorts, tankage and pasturage with corn many times daily, never over feeding, coupled with ideal care, exercise and sanitary surroundings. It is not best to overfeed or crowd the corn ration until the pig is at least 4 months of age. The feeding of aged sows is perhaps the easiest as they are usually suckling brood sows of good appetites and capacity for foodstuffs. For September show they may be started as late as June,

while aged boars should be started in March or April.

Yearling and senior yearling boars and sows generally do best started in April or May, while fall boars and sows, as well as six months pigs must be fed consistently from birth to show pen. When show boars and show sows are fed judiciously their worth as breeding animals is not impaired.

The feeding of aged yearling and senior yearling sows demands pasture exercise, corn, shorts and tankage to bring the full fat bloom at fair time. They may be bred to farrow a few weeks later. The mineral balance of the ration must be correctly supplied. While milk, tankage and forages supply considerable mineral matter, either may be over fed. The best method to properly balance in mineral is to provide access to a combination of wood ashes, charcoal, sulphur, ground lime stone, ground phosphate, rock and salt. A small amount of brown sugar or cane molasses mixed into the slops will prove appetizing and makes the food more palatable, especially to slow, hard feeders. Eggs and milk also serve the same purpose.

Yearling and aged animals should shed their coat of hair and possess a new slick one a few weeks before fair time. Should any fail applications of skin softening oils may be used followed by washing the entire body with soap and water. The rubbing with corn cobs on scurvy, scaly spots and the free use of disinfectant oils with repeated washing will eventually effect a soft, healthy skin and a new slick coat. The feet of aged hogs require attention; the long hoofs and claws should be trimmed and soaked frequently in disinfectant oil. The hoofs will sometimes crack or become sore from objects embedded between the foot pads. The tusks of boars should be removed early during the feeding period.

Should the coat be too hard or late in shedding with

ordinary aid, wallow holes of a thick clay mud or common mud with wood ashes added are used so that the hog may be plastered with a thick coat of mud. A few applications usually shed the old hair. The practice of clipping is recommended only to trim up the rough edges about the head, ears and tail. Wherein the whole coat is noticeably clipped, it is usually against the individual in show rings.

The handling and shipping of hogs to the place of exhibition demands considerable foresight and care. Each animal should be provided with a crate and bedded with clean, wet sand. Plenty of water should be provided in the cars, with pails, sprinklers and spray pumps. Free ventilation should be arranged for each animal. Sow herds or bunches of young gilts may be turned loose in the ends of the cars. During the heat of the day water may be sprinkled frequently but not excessively and sparingly during the cool hours of the night to avoid colds and pneumonia. The feed en route should be light, with frequent drinks of water. Many a good show hog has been lost or died from an attack of pneumonia, brought on by careless shipping attention.

Upon arrival at the fair grounds the hogs should be taken to the pens carefully and allowed to rest in cool, wet sand or hay bedding, for at least six or eight hours, with but a light feeding and watering, after which they may be given a slightly heavier feeding similar to that given at home, slightly increasing at each feeding until that just prior to showing, when a full feeding of milk and slops should be given.

All show hogs should be exercised while at the fair at least every night and morning by driving them about the same distance they were accustomed to while at home.

Nearly every exhibitor has his own special hair dressing. The best and cleanest is made with a light parafine

lubricating oil cut with wood alcohol or gasoline with a small amount of some cresol as a disinfectant. Lamp black should never be added to any dressing nor heavy gumming oils used.

The art of successfully exhibiting hogs depends largely upon good common sense. Deception rarely pays in the show ring. Every exhibitor should have his animals trained so he can handle them easily, with but little prompting from a cane or stick. Short, tightly made hurdles may be used for matured boars. At least two men should attend each animal, one directing the hog's movements, the other armed with a brush and sprinkling can keeping the animal polished properly between the periods of the judges' inspection.

When the judge arrives to look the hog over all polishing should cease and the hog handled by the first attendant so that the judge may see all its good qualities without glaring, evident attempts to cover up its bad ones. In close decisions the judge should be allowed to handle the hog alone for a few minutes so that he may find either unseen good or bad points.

Most successful showmen are ever alert to present the best front and generally take their medicine without "crabbing," while a few do get by with deception and underhand methods. But they soon lose caste with both judge and fellow breeders.

All hogs intended for exhibition at fairs must be immunized by the simultaneous treatment, as serum provides only temporary immunity at the best.

If the hogs are to be shown at other fairs their care and feeding becomes quite a problem, to keep appetite, consumption of food and show bloom near perfection. A close study of the hog's nature, providing sufficient exercise, proper kind and amount of feeding during each period, generally carries the individuals and herds through

in pink of condition. The proper show flesh should only be a high, fully rounded, breeding condition and it is an easy matter to reduce such animals to ideal breeding condition within a few weeks after arrival at home.

They should be returned to former quarters wherein there should be plenty of pasturage or forage. Light feedings of milk and slops with little corn should be given, with free access to a mineral combination and plenty of pure water. They should be housed in warm, dry quarters every night and disinfectants used freely in quarters and on premises. They should be kept away from the other hogs of the farm for at least three weeks as a safeguard against possible infection. Over-fattened animals may be reduced in a like manner within a few weeks' longer period.

CHAPTER XLV

JUDGING SWINE

THE real hog judge has acquired his fund of knowledge and ability to discern, compare and arrive at proper decisions almost infallibly from his many years of practical experience as a breeder, feeder and exhibitor of swine. If this has been of a broad nature, coupled with considerable study of all breeding, feeding and market problems, such a man may be termed as qualified to judge hogs, and how well, depends largely upon the natural genius of the man, his proven success as a hog man and his sterling integrity, uninfluenced by friendship, blood lines or prejudices, ever passing his honest judgment consistently without fear or favor, regardless of pressure of influence or following criticisms. Judges often lose caste by attempting to cater to popularity, giving consolation ribbons, dividing equally as possible between prominent exhibitors, giving rank decisions to undeserving animals, or switching from one type to the other. The hog judge should be free of any serious suspicion of personal interest, financial or otherwise, in the winning of any certain individual or family. For these reasons alone, broad minded, long experienced breeders are recommended above all others, with packing house buyers and state farm instructors following. The selection of live stock auctioneers, newspaper representatives, or of any hog man identified with the boom of any individual or family, is disapproved of entirely.

The hog judge naturally is human and errs accordingly, but when he judges with a clear conscience his decisions generally tend to the upbuilding of type and breed as well as confidence in the business, but when he permits his decisions to become perverted by outside influences, it creates a diversity of idea of type that retards and prevents progression and, lastly, destroys human confidence in fellowman, without which no type or breed can long exist.

In the judging of lard type hogs the following cardinal points must be considered:

First: That the individual be a good representative of the breed.

Second: That it be of the recognized type.

Third: That it possess size sufficient and in proper condition for age.

Fourth: That the animal shows conformation of and evident signs of a breeding animal.

Fifth: That it has not any serious defect to disqualify, such as blindness, broken down feet, one-seeded, ruptured, swirly or cut in two with creases, etc.

Sixth: That the individual possesses good health and evident vigor and vitality, not lazy.

Seventh: That it be evidently an easy feeder and of fairly early maturity.

Eighth: That the disposition be rather quiet and docile, but not excessively so.

Ninth: The general style and carriage of the body should be free and graceful.

Tenth: The general symmetry of all points.

Following come the most essential points of excellence in order about as noted:

Back and Loins—In show form these should be broad and full with a slight arch and connecting evenly with rump hams and shoulders without swag and creases.

Sides and Hams—These with the back, contain the highest quality meats. The hams should be of good breadth at top, full, long and deep, tapering down at hock, presenting a well rounded plump appearance, connecting evenly with all adjoining points. The rump rounded and slopingly connecting between

back and ham, not too abrupt, being of same width and well filled at tail.

Sides and Belly—These should be full, smooth and of good depth with a well sprung rib at top and a straight well filled belly or underline at the bottom. The sides should fill to a straight edge from shoulder to ham. Good breeders, feeders and "doers" carry a good sized "bread basket."

Shoulder and Chest—The shoulder should be well fleshed, full, even and smooth, connecting evenly with back and sides, without deep creases or wrinkles in or between shoulder and connecting parts, tapering in width down to leg and chest. Boars should not have over developed shields. The chest should be broad and deep, showing good width between fore legs and good capacity for heart and lungs.

Feet and Legs—The make up of the bone frame is very essential, a good idea of its construction is outwardly shown by the feet and legs. The legs should be of medium length and set straight under the four corners of the body, tapering slightly down to foot. The bones of strong texture and of slightly rounded shape, without large joints or of coarse, flat, soft or weak construction. The feet should be fairly short, uniform in size with legs, pasterns short, and standing up on feet straight and square without the dewclaws pressing on the grounds. Too large, long or too fine bones, crooked, knockkneed or broken down feet are highly objectionable if not disqualifying.

Head and Neck—The general shape of the head should be of medium length and good width tapering from top and back down to a medium sized nose. The top or neck should be slightly arched, full, wide or slightly oval, connecting evenly with shoulders. The ears of medium size set wide apart and controlled by animal. The eyes clear, full and set wide apart. The face slightly dished, rather plain and tapering uniformly down to the nose. The nose of medium size.

Jowl—Medium, full, smooth, firm and rounded without creases or flabbiness, carrying fullness well back to shoulder and brisket.

Tail—The tail should be of medium size tapering from butt to tip and equipped with a brush of medium length bristles. The tail should set neither too high nor too low on the rump and carried with style in a curve or twist.

Coat and Color—The hair fine, straight, smooth and close lying, well distributed. The skin, healthy, smooth, free from wrinkles, creases or great thickness. Coarse, bristly, curly swirly or too fine, thin, uneven hair is objectionable if not disqualifying. The color should be of conformity to breed without evidence of atavism such as sandy, spotted or speckled with off colored hairs.

CHAPTER XLVI

THE BEST TIME TO MARKET HOGS

MANY hog men are content to follow the beaten paths of the crowd without much study of better methods, willingly accepting whatever be the financial returns of the common practice of marketing.

The price of pork hogs is governed largely by the supply and demand for the various pork products, whether it be for lard, bacon, hams or fresh pork, of which the fresh pork is by far the most important in its relation to the price paid for the hogs on the market.

Fresh pork consists of pork loin, butts, spare ribs, trimmings for sausage, etc., which altogether make up about 20% of the live weight of the hog. These are highly perishable and must be used as soon as possible after cutting up the hog. Hams, bacon and shoulders, on the other hand, are usually cured and smoked and can be kept in good condition for a long period of time. Lard can also be kept in cold storage against future demand and market.

The universal custom of pork producers is to plan that the biggest crop of pigs be farrowed in the spring season of the year, and given free access to a forage range during the summertime and finished on the feeding of new corn during the fall, ultimately marketing the bulk of them in a comparatively short period of time, during the winter and spring months. This course of procedure naturally has a depressing action upon the market as the surplus piled up from the

slaughter of these heavy receipts must be carried in cure by the packing houses until the demand and consumption will again overtake the supply.

The demand for fresh pork is also entirely separate from the demand for cured meats, and after the heavy winter receipts of hogs have decreased, the demand for fresh pork will cause a sharp reaction in the hog market as this must be filled without a regard to the possible over-supply at the same time of the cured product.

It is of common knowledge that after the first of July about 50 to 60% of the receipts of hogs consists of brood sows that are not suitable to be used for fresh meat trade, consequently there is a scarcity of hogs for fresh pork trade until the new crop of pigs begin to move during the late fall months. Hence, butcher hogs weighing from 200 to 250 pounds bring a good premium during the months of August, September and October and recommends the custom of raising two litters of pigs annually, especially a good crop of fall pigs that can be carried through the winter, finished on summer forage with corn and marketed during the months of August, September and October, which are the highest market months of the year. However, the available supply of marketable hogs now is annually highest during the months of December, January, February and March. These hogs for the most part are the bulk of the previous spring's pig crop, sprinkled with a few fattened-out brood sows. Then again, the natural season for fattening and finishing hogs is during the fall and early winter months, after the farm crops have matured and when the farmer has little else to do but to feed and tend to his live stock.

The commencement of spring work and final marketing of beef cattle along with the assessment time cleans up many hog yards during February and March. This oftentimes causes the "glut" of the market and decline

of price that would pay for the taxes manyfold. With the real start of spring work, the shipments generally decrease enough to give cause for a keener demand and consequent rise of prices during the latter part of March and in April, and many feeders are delayed by various causes in marketing their finished or heavy hogs during the months of March and April and sometimes May. This fact contributes largely to the heavy hogs not taking an upward trend in unison with the mediums and lights until sometimes as late as June, despite the fact that the summer packing demand for heavy hogs opens in March or April.

The medium weights on the other hand are usually of good demand and price and the keenest to feel the effect of supply and demand, but the light weights usually outsell them, especially during the high month of September. This is mainly of interest to the shipper of fancy lean bacon hogs.

While the medium and heavy weights prevail during the winter season, the medium and light weights usually predominate during the summer and early fall months. During the crop raising and harvesting periods there is a scarcity of finished hogs and a prevalence of light unmarketable pigs and of half-fattened discarded brood sows, which creates a keen demand for finished market hogs of any grade during July, August and September. But the finishing of harvest and attending high prices brings a general clean-up of all the available market hogs in the country during September and October, which is usually of a high per cent of unfinished light and medium weight hogs, followed soon by old sows and soft new corn fed hogs. The number and quality of these bears the market daily down to lower levels, until midwinter, when the flood of finished hogs once more reaches its height.

The best plan of procedure is to breed, develop and fatten hogs for market in a continuous rotation, arranging that the spring pig crop be farrowed early in the season during January or February and the fall crop during August, which, with good care and feed, should reach the market in good finished condition and bring the highest market prices.

The common practice of waiting for the maturing of new corn to fatten the spring pig crop causes them to reach the market during the lowest months of the year. If the feeder cannot arrange for earlier farrowing or for force feeding of his spring pigs, it may be advisable to let the pigs come later in April, May or June and grow them on forages and finish with corn for the next year late spring and early summer markets.

Fall pigs can be given a good start while green forage lasts and be cared for and fed so they will also reach the high market of early summer, or carried roughly through the winter and finished on pasturage and grains for the high months of August and September.

The practice of waiting for higher markets with finished hogs is rarely profitable, it being better to sell when ready, and start a new bunch on feed. Neither is the practice of long development profitable unless the hogs have forage in abundance and keep thriving without stunting or other serious setbacks. The most gratifying results usually attend short high feedings, after the cheap developing period, and being ready for the high markets annually with a crop of finished porkers.

In conclusion, it is better to arrange to produce and market hogs at around 250 pounds weight in the shortest time possible in accordance to local environments and condition. This policy will prove the most practical and profitable to follow in pork production.

CHAPTER XLVII

THE MARKETING OF SWINE

Hogs primarily are produced for monetary returns. To this end eventually the breeding herd arrives in the market along with the fat hogs.

The manner or system of marketing varies widely. Perhaps the best rule of procedure is to not always follow the crowd; breed many sows when the crowd hesitates, breed a normal number when the crowd is hog crazy, breed early when they breed late, breed for fall pigs when they question the advisability, feed for early market when they plan to feed for late, buy hogs when the crowd wants to sell, and sell hogs when they rush to buy.

Hogs are marketed either to the local butchers or packers or shipped to large live stock markets, where they are slaughtered in large packing houses, or reshipped to other markets for slaughter. They are either consigned by the producers or sold to the country buyer or shipper, who consigns them to some commission firm doing business at a central live stock market. The hogs are sometimes consigned direct to the packers, but this practice if adopted in general would eliminate much competition and eventually leave the price largely to the generosity of the packer.

The live stock commission firms do either a selling or buying business, and have fixed charges for their services rendered based on the individual or carload. They per-

form all the duties as the owner's agent faithfully and well, tending to the yarding, feeding, selling, weighing, paying the freight and all other charges, guaranteeing and remitting the net proceeds, also furnishing and advising the producer of the market supply and demand throughout the entire year, besides securing or personally advancing financial assistance to handle live stock production operations of other range or feed lots.

The manner and routine of hauling hogs to the shipping station and care during transit together with that of their care and routine of handling, feeding and selling is of common knowledge to most hog producers. The best methods to follow are those that have been found most practical and successful without attempting to experiment with new ideas. This means to handle the hogs quietly and carefully, keeping their temperature as near normal as possible, feeding very little for at least twelve hours before loading, and to ship them in a car bedded with sand during the summertime, and with wheat or rye straw during the wintertime.

Manure and kindred material are heating and usually give the hog a dirty appearance, which may take five or ten cents per hundred off the market returns. The car should not be overloaded with either number or weight, or underloaded. The proper way is just sufficient, so that the hogs will cushion against each other during the switching and handling of the cars.

During extremely hot weather it is well for a man to accompany the shipment, so that the hogs may be given water and prevented from piling up or fighting, which usually occurs when strange bunches of hogs are shipped together, or when in an excitable state caused by rough handling.

The practice of filling the hogs with food substances and water before weighing them to the shipper or just

before being weighed at the stock yards has but few commendable features. A hog to ship well or to kill out well should have but little food for several hours previous; then again, the overfeeding both at home and at the stock yards, as it is commonly practiced, sets up digestive disturbances which cause fever to arise in the animal. This is especially true of stock or light weight hogs when over-fed on corn or other such heating foods, or irritating substances. This practice also makes a waste of thousands of dollars of foodstuffs daily in practically every central live stock market, and no doubt affects the character of the pork products of many hogs.

This practice should be forbidden in the interest of health and conservation. The feeding for all animals intended for market and slaughter should be just sufficient for the maintenance of life, with free access to water, for at least twenty-four to forty-eight hours previous to shipping. It is believed that the packers would readily pay enough more for such hogs to make up for the lack of "fill."

Besides the packing house buyers at every live stock market are the speculators who make a business of buying and selling hogs. To a certain extent the speculator makes competition more keen, the market more stable, and as he has varied outlets for his purchases to many small independent packers, the speculator is oftentimes the life of the market. While the speculator is commonly classed as a useless middle man and charged with taking a profit which he has not rightfully earned, a studied résumé of his operations, especially in the hog business, proves to the contrary in the majority of instances. The speculator usually makes his profit by buying hogs of various colors and grades, cheaply, and sorting them best for color, weights and grades, and then selling them accordingly for the highest price obtainable from his many cus-

tomers. In this manner of procedure, he can often sort out loads at 10¢ to 25¢ per cwt. profit, from the fact that he knows and can supply each customer with his own peculiar and different grades of hogs. While a few speculators are credited with making much money, the majority, as in most other lines of business, make but a good living, and all face a big loss many times throughout the year.

CHAPTER XLVIII

DISPOSAL OF DEAD HOGS

THE disposition of dead hogs is of the utmost importance to all hog raisers. Carcasses or parts of them should never lie exposed on the premises, regardless of the cause or nature of the hog's death. The practice of hauling dead hogs to the back of the farm, throwing them in streams or in fields, should be termed as a criminal act.

The practice of half-way burying them is but little better, for no matter how deeply hogs are buried, there is danger of animals, such as dogs, wolves, rodents, etc., bringing parts of the carcasses to the surface, and then, too, the act of burying scatters germs from the bottom of the pit up to the last shovel of earth thrown to fill the grave. Instances of infection have occurred by man or animal walking close to or over such burying places, as worms and insects may bring the germs to the surface.

The only sure way of destroying all germ life and insuring protection against infection is to thoroughly burn all carcasses to a cinder ash. However, hogs may be buried in pits 5 or 6 ft. deep, with quicklime dumped freely in the hole over the carcass and scattered over the mound and close proximity. This practically assures destruction of germs and protection.

To burn the carcasses of hogs, the best plan is to dig a trench about 16 inches wide and of the same depth. The length can be made to accommodate the number of hogs

to be burned at a time. Iron bars should be placed crosswise of the trench every 6 or 8 inches to support the hog. The hog should be placed on one side or back lengthwise within the trench, and its body slashed or scarified with a knife or axe, to allow the heat to reach the fats, which will run into the fire and aid in consuming the animal. The fire can be built in the bottom of the trench with cobs, kindling and wood, and rarely needs replenishing, once under good headway. The hog man should see that all parts are thoroughly burned as germs may survive in unburnt portions.

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