W. B. Bunn

Feed Lot Types
FEED LOT TYPES

WITH

SPECIAL REFERENCE TO PORK PRODUCTION

BY

WILLIAM BENTON BUNN

THESIS

FOR THE

DEGREE OF BACHELOR OF SCIENCE

IN

AGRICULTURE

COLLEGE OF AGRICULTURE

UNIVERSITY OF ILLINOIS

1920
UNIVERSITY OF ILLINOIS

June 1, 1920

THIS IS TO CERTIFY THAT THE THESIS PREPARED UNDER MY SUPERVISION BY

William Benton Burn

ENTITLED Feed Lot Types with Special Reference to Pork Production

IS APPROVED BY ME AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE

DEGREE OF Bachelor of Science

Walter Castello Coffey

Instructor in Charge

Head of Department of Animal Husbandry

453044
FEED-LOT TYPES

With Special Reference to Pork Production

CHAPTER

Introduction

1 Why Feed-Lot Production Varies with Individuality

Introduction
Maintenance
Factors Affecting the Maintenance Requirement
Temperament
Plane of nutrition
Fattening
Age

Capacity
Type
Total Metabolic Capacity

The Central Nervous System
The Endocrine Glands as Factors, Causing Variations in the Metabolism
The Thyroid Gland
The Adrenals
The Pancreas
The Pituitary Body
Other Glands

Growth
Body Fat Production

II Feed-Lot Types in Cattle

Beef Type vs. Dairy Type
Breeds of Feeding Cattle
Fancy Select
Choice
Good
Medium
Common
 Inferior

III Feed-Lot Types in Sheep

Mutton Type vs. Wool Type
# FEED-LOT TYPES

With Special Reference to Pork Production

## CHAPTER

<table>
<thead>
<tr>
<th>Introduction</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Thy Feed-Lot Production Varies with Individuality</td>
<td>2</td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
</tr>
<tr>
<td>Factors Affecting the Maintenance Requirement</td>
<td></td>
</tr>
<tr>
<td>Temperament</td>
<td></td>
</tr>
<tr>
<td>Plane of Nutrition</td>
<td></td>
</tr>
<tr>
<td>Fattening</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>Capacity</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Total Metabolic Capacity</td>
<td></td>
</tr>
<tr>
<td>The Central Nervous System</td>
<td></td>
</tr>
<tr>
<td>The Endocrine Glands as Factors, causing</td>
<td></td>
</tr>
<tr>
<td>Variations in the Metabolism</td>
<td></td>
</tr>
<tr>
<td>The Thyroid Gland</td>
<td></td>
</tr>
<tr>
<td>The Adrenals</td>
<td></td>
</tr>
<tr>
<td>The Pancreas</td>
<td></td>
</tr>
<tr>
<td>The Pituitary Body</td>
<td></td>
</tr>
<tr>
<td>Other Glands</td>
<td></td>
</tr>
<tr>
<td>Growth</td>
<td></td>
</tr>
<tr>
<td>Body Fat Production</td>
<td></td>
</tr>
<tr>
<td>II Feed-Lot Types in Cattle</td>
<td>11</td>
</tr>
<tr>
<td>Beef Type vs. Dairy Type</td>
<td></td>
</tr>
<tr>
<td>Grades of Feeding Cattle</td>
<td></td>
</tr>
<tr>
<td>Fancy Select</td>
<td></td>
</tr>
<tr>
<td>Choice</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Common</td>
<td></td>
</tr>
<tr>
<td>Inferior</td>
<td></td>
</tr>
<tr>
<td>III Feed-Lot Types in Sheep</td>
<td>17</td>
</tr>
<tr>
<td>Mutton Type vs. Wool Type</td>
<td></td>
</tr>
</tbody>
</table>
Grades of Sheep
    Fancy Select
    Choice
    Good
    Medium
    Common and Inferior

What Kind of Feeding Sheep to Buy
Best Type of Feeder
Comments

IV Feed-Lot Types in Hogs

Introduction
The Feeder
Selecting Hogs for Type and Profit
Must be Good Killing Type
An Analysis of the Dressed Hog
Lard vs. Bacon
Advantages vs. Disadvantages of the Big Type
Views of Practical Feeders
Facts Revealed by Questionaire
Comments by Feelers
Experiment Station Results

Classification of Feeder Hogs

Choice
Good
Medium
Common and Inferior
Conclusion
FEED-LOT TYPES WITH SPECIAL REFERENCE TO PORK PRODUCTION

INTRODUCTION

The best feed-lot types, with special reference to pork production is the aim of the thesis. Sometimes fads or extremes reign supreme in a breed. In a few instances they have been beneficial, in many, they have been detrimental. Five or ten years ago, a type now designated as "medium" or "small"—the low to the ground, broad backed, compactly built type was the dominating type. Today the "big type"—the type with heavy bone, stretch, size and general ruggedness seems to be gaining favor. This latter type is the one type that the breeders of the principal breeds recognize. The pendulum seems to be swinging toward extremes. What has brought about this change of type? Are the feeders benefited, or handicaped by this change in type? What is the best feed-lot type?

The discussion on the following pages is the result of an effort to ascertain and bring into the foreground, factors inherent in and external characteristics of individual animals which influence economic and rapid production.
CHAPTER I

WHY FEED-LOT PRODUCTION VARIES WITH INDIVIDUALITY

Introduction.—Great individual differences occur in every form of animal production. Young animals of the same species differ in rate of growth, in the relative growth of different parts of the body and therefore in their eventual proportions. Similar differences exist in the formation of body fat, in work and milk production and in every other particular in which domesticated animals are useful to man. The discussion in this chapter attempts to bring into the foreground the factors inherent in individual animals which are responsible for differences in rapidity and economy of gains in the feed-lot.

Maintenance. The food maintenance requirement calls for enough metabolizable energy.

(1) To carry on the normal functions and vital activities of the body.

(2) For the maintenance of a constant temperature.

(3) For the support of the body in a standing position part of the time, and for other voluntary movements.

(4) For the mastication, digestion, and assimilation of the food consumed.

The surface area of the body has long been considered a more
accurate index of the maintenance requirement than the body weight. Lusk, Dubois, and others\textsuperscript{1} treat the relationship as a physiological law, and as though the skin area had a causal relationship.

Factors Affecting The Maintenance Requirement.

I. Temperament. Armst\textsuperscript{y} concludes that the differences between the maintenance requirements of different animals ascribed to individuality are due to a large extent to varying amounts of muscular activity. They are, therefore, closely related to the animals temperament or disposition. The nervous, restless, excitable animal has a materially greater maintenance requirement than a quiet phlegmatic one. He found\textsuperscript{2} in comparing steers of different type, a large difference in the amount of time spent standing. The percentage ranging from 34 in one case to 85 in another, with an average of 43 percent. He also found a greater increase in metabolism from standing in the scrub dairy steer than in the beef steer. For these two individuals the therms of net energy required for maintenance, compared per 1000 pounds weight and corrected to a uniform time of twelve hours standing were as follows:\textsuperscript{3}

<table>
<thead>
<tr>
<th>Year</th>
<th>Beef Steak</th>
<th>Scrub Dairy Steak</th>
</tr>
</thead>
<tbody>
<tr>
<td>1905</td>
<td>5.873 therms</td>
<td>6.052 therms</td>
</tr>
<tr>
<td>1906</td>
<td>6.272 &quot;</td>
<td>6.305 &quot;</td>
</tr>
<tr>
<td>1907</td>
<td>4.723 &quot;</td>
<td>6.067 &quot;</td>
</tr>
<tr>
<td>Av.</td>
<td>5.623 &quot;</td>
<td>6.141 &quot;</td>
</tr>
</tbody>
</table>

2. Plane of Nutrition. An animal which has been highly fed for some time will require a larger amount of feed for maintenance than a similar animal which has been sparsely fed and is in a more or less reduced condition.

\textsuperscript{1}Journal Am. Med. Ass'n. 69, 1917, 1264-5
\textsuperscript{2}Jour. of Agr. Resit III, Nov. 6, 1915.
\textsuperscript{3}Bur. an Ind. Bul. 143, 1912, 67
3. **Fattening.** Fat animals have a relatively greater maintenance requirement than thin ones. This fact seems to be fairly well established as shown by experiments of Kellner and of Evvard with cattle. It is generally admitted that in the case of the nearly mature fattening animal the rate of gain in live weight decreases as the fattening progresses until a limit is reached beyond which the increase, if obtained at all, is slow and very costly. Several causes are responsible for this. First, the maintenance requirement of the animal increases with its gain in weight. The capacity of the digestive organs, however, undergoes no corresponding increase, and consequently the amount of excess feed is correspondingly reduced and its proportion in the ration made less, so that the total feed requirement per unit of gain will be greater. Second, the appetite of well-fatted animals not infrequently diminishes, resulting in a lessened consumption of feed. This again has a double effect, diminishing the total amount of excess feed available and reducing the ratio of excess feed to total feed.

4. **Age.** The older the animal, the greater the maintenance. This statement holds true in a general way.

**Capacity.** Henry\(^1\) in 1889 expressed a belief that the greater length of the intestine of the domestic hog as compared with the wild one was due to the unanimity of breeders in pushing the animal toward early maturity and the largest gain for a given amount of feed consumed. He believed in the greater physiologic as well as economic efficiency of the animal of large intestinal tract. At the Illinois Station in a hundred and sixty day test of various

\(^1\)Wis. Station An. Rep't 1889
market grades of feeders, one steer gained an average of 3.44# while another gained only 1# daily. Prof. Rusk, of the Illinois Station stated that the steer that made the large daily gain almost invariably, according to records, was accredited with a "clean trough" after each feeding, while on the other hand the slow gaining steer seldom was accredited with a "clean trough." In other words the rapidly gaining steer consumed more food than did the slowly gaining one. At the close of the experiment, the two steers in question were slaughtered and their alimentary tracts measured. The rapid gaining steer had an alimentary tract one hundred ninety feet in length, while the others' was one hundred fifty-five feet. The probable influence of intestinal capacity on the amount of digestion products available for growth and fattening, and therefore on the rate of growth is evident. Variations in the size and length of the digestive tract probably play a part in the differences in completeness of absorption.

Animals within any group will show pronounced variations in the total quantity of food they are able to take in and utilize. Such differences are very important. Selective improvement in fact, is largely based in the direction of an increase in the possible food intake even at the expense of slightly lowered digestibility. An important element of individual superiority is the ability of an animal to consume regularly large amounts of feed. Of two animals otherwise similar, it is clear that the one which is able to consume day after day the heavier ration is the better meat producer. It is not always realized, however, that the heavier feeder makes a relatively more profitable use of his feed.
Type. Type is a factor influencing the basal metabolism to which animal husbandmen are likely to attach considerable importance. Benedict\(^1\) points out that two men of the same weight but differing in height, the shorter would usually have less active tissue and would also have relatively less body surface. This is evident from a consideration of Dubois\(^2\) height-weight formula \(A = 0.425 \times W \times 0.725 \times H\), \(A\) being the surface area in sq. cm., \(H\), the height in cm, \(W\), the weight in kilograms, and \(C\) a constant for the species. If \(W\) is constant then \(A\) would be greater or less according to the values for \(H\). This coincides with the belief of the majority of livestock men, that the long rangy animals are "hard keepers." Stockmen think of maintenance in terms of individuals or per 1000\# live weight, not in terms of surface area, because production is measured in terms of the individual. Armsby's notable work with a scrub dairy and a beef type steer showed a much higher maintenance cost for the former even after differences in time of standing were eliminated. Differences in other forms of activity may have been largely responsible although the preceding considerations would lead one to expect that differences in body surface and active protoplasm in proportion to weight would be partly responsible for the difference found.

Total Metabolic Capacity. "Animals differ in their power to assimilate certain substances which they can digest and absorb. They differ in the average height of the metabolic plane, and probably more important than either of these, they differ in the upper limits of their metabolic power\(^3\)." Differences in the rate of

\(^1\)Jones. Biol. Chem. 20, 1915, 281
\(^2\)Arch Int. Med. 17, 1916, 865-811
\(^3\)Prof. G. Gusler, Thesis for M.S. 1918
growth, in body fat formation, in milk or work production under optimum conditions for the manifestation of these functions depend upon difference in total metabolic power of the organism as a whole or of the particular tissues involved.

The metabolism may vary in different individuals because of the influence of the regulators of metabolism including the nervous system and endocrine glands or because of the conditions surrounding the cells which influence their response to these regulating agents.

I. The Central Nervous System.

In the adult it is said that the nervous system is the most important of the regulators of metabolism. It is intimately connected with the functions of circulation, respiration and secretion.

2. The Endocrine Glands as Factors Causing Variations in the Metabolism.

Along with the nervous system the glands of internal secretion including the thyroid, hypophysis, adrenals, pancreas, spleen, parathyroids, and gonads have an important part in the control of metabolism. They influence each other by inhibition or stimulation and their activity may be stimulated by the sympathetic nervous system. In some cases the activity of the glands affects the irritability of the nerves.

A. The Thyroid Gland. Deficient thyroid secretion in young animals prevents their developing normally, the amount of deficiency varying from nearly total lack of development in extreme cases to slight grades of defective development or delayed maturity.

B. The Adrenals. The adrenals are composed of two parts, a
cortical portion and a medulla. The medulla furnishes a secretion known as adrenaline. The action of adrenaline seems to be largely that of stimulating the sympathetic nerve endings upon all on which it acts. It increases their excitability or effectiveness.

C. The Pancreas. The pancreas is believed to produce an internal secretion called inulin which has a most important influence upon the sugar burning capacity of the animal. Normal animals\(^1\) can assimilate practically unlimited amounts of carbohydrate food with only minor losses in the urine.

D. The Pituitary Body. This gland plays a part in the maintenance of sympathetic irritability. Its removal\(^2\) results in lowered metabolism and a slight fall of temperature.

E. Other Glands. Other glands which have an influence upon the metabolic powers are the parathyroids, the gonads and the spleen. The parathyroids have for their normal function the depression of the sympathetic irritability. The sexual glands exert a marked effect on the sympathetic nervous system. Individual variations are great. The quiet phlegmatic type of animal is least affected. Removal of the spleen is said to increase the food required to maintain an unchanged weight.

Other factors causing differences in the total metabolic capacity of the individual are:

1. Variations in assimilating power due to the liver.
2. Variations in metabolic capacity due to the blood supply to the tissues.

\(^1\)Grindley, Mitchell and others, Class Manuel, 1918, 371
\(^2\)Mathews, Physiological Chemistry, 1915, 643-649
3. Variations due to the chemical agencies in the cells.

4. Variations due to the physical factors in the cell.¹

**Growth.** Marked differences exist between individuals of the same species in the rate, the relative growth of the various parts of the body and in all the other manifestations of growth. It has been said that growth is the resultant of an inherent growth impulse and a suitable environment.² Heredity and environment are the two factors on which the rate-, length and ultimate growth are measured.

In general, growth is due to an increase in number of cells, an increase in size of cells, or a deposit of intercellular material. The first two of these are more important and an increase in the number of cells is especially characteristic of the embryonic stages of development, while growth later consists in a greater degree of the enlargement of individual cells.³ Practically the same internal forces influence the rate and length of growth as were given under Total Metabolic Capacity.

Breeders in all classes of stock strive to obtain size with quality in individuals. The latter characteristic is understood to mean refinement and is sometimes said to involve fineness or smallness in the individual cells. It is the prevalent belief also that size and quality are more or less antagonistic on the ground that size involves larger cell units.

**Body Fat Production.** Within each species of our meat making animals, well known individual differences with reference to body

¹Prof. G. Gusler M.S. Thesis 1918
fat formation exist. The beef and dairy bred steer, the bacon and lard type hog, and the mutton and wool type sheep show the large differences in physiological habit which may occur.

Armsby and Fries\(^1\) concluded from the results of their comparison of a purebred beef steer and the scrub steer that the difference in gaining ability was due to greater ingestion of food above the maintenance requirement. The purebred ate more; that is, he had a greater digestive capacity, and also, his maintenance requirement was lower so that a larger supply of nutrients was available for conversion into fat. The purebred tended to fatten relatively early in life while the scrub enlarged in bone and muscle more exclusively.

The glands of internal secretion influence the tendency to form fat by lowering or raising the maintenance requirement or by affecting the assimilating power for the nutrients, particularly carbohydrates, but probably not by increasing the activity of the fat forming cells. Castration is associated with adiposity. It lowers the sympathetic irritability, thus altering the disposition and leading to reduced muscular activity, and therefore to a lower maintenance requirement.

CHAPTER 11

FEED-LOT TYPES IN CATTLE

Beef Type vs. Dairy Type---The typical beef type animal is one that is low-set, deep, broad and compactly built throughout. When well fattened the beef type should possess a rectangular or cylindrical form. A typical dairy type animal is one that is rather upright, sparse in natural fleshing and angular in outline or conformation. Any one that has had only slight experience in cattle feeding knows that the dairy type is to be avoided, for the steer or heifer that shows a preponderance of dairy blood will quite likely make an uneconomic feeder. What is there about the dairy type animal that indicates an undesirable and uneconomic feed-lot type when compared with the typical beef type?

Observance soon teaches one that the animal that possesses the angular dairy conformation is more energetic, nervous and excitable than the more compactly built beef type. There is beyond a doubt a close correlation between type and nervous temperament. The nervous, restless animal has a greater maintenance requirement than the more quiet phlegmatic one. Armsby found that the energy requirement of a scrub dairy steer, computed to the same live weight of a pure bred beef steer was 18.7% higher.

The Nebraska Experiment Station, a few years ago ran an experi-
ment with various breeds and types. It was observed in this experi-
ment that the representatives of the beef breeds did not make any larger
gains than the representatives of the dairy breeds during the first
eighteen months, but the profits made by the better bred beef cattle
were in the main considerably larger than on the dairy bred steers. ¹
A chief objection to dairy breeds for the production of beef is the
fact that they are very slow to fatten and must be kept in the feed-
lots for a longer time than is ordinarily needed by the beef breeds.

Type or conformation seems to be a controlling factor. The
low set, more compact types have something of an advantage in gains
and much in early maturity over the rangy, angular type. The large
framed individual which possesses lowsetness, and compactness in
fairly equal proportions to the small framed individual that pos-
sesses these characteristics, generally is the more rapid gainer.
The conception of maturity is commercial, rather than physiological.
The butcher-packer demands a certain size and conformation of car-
cass. To reach this at an early age almost necessarily implies a
greater rate of growth, whether measured physiologically by increase
of protein tissue or practically by gain in weight.

Most dairy type steers are somewhat shallow bodied or have a
tendency to be "slab sidei," while on the other hand a typical choice
or good beef type steer is rotund and deep in form. The latter type
has more digestive capacity. Nebraska Experiment Station proved
that large gains are associated quite closely with the relative size
of the middle girth. Seemingly the larger the middle girth the
more rapid the gain.

The desirable beef type animal is, as has been before mentioned, a compactly built, muscular animal, while on the other hand the dairy animal is angular, rough appearing, and lacking in natural fleshing. This latter type has far more square inches of surface area for a given weight than does the compactly built animal. Dubois and others have proven quite conclusively that surface area plays an important part in the maintenance. Evidently then, from the above reasoning, dairy animals in the feed-lot require a greater amount of food to maintain them, than in the case of a typical beef type animal of similar weight.

It is a well recognized fact that the conformation of a meat animal is a very important factor in determining its selling price. The improved beef breeds, as a rule, produce a higher dressing percentage carcass, a better distribution of fat in the finished carcass, and a somewhat larger proportion of the higher priced cuts and better marbled meat than the dairy bred animal. Because of the above factors butchers and packers can for economic reasons pay more per pound for the beef type steer than for the dairy type steer. It is self evident because of greater capacity, lower maintenance requirement, earlier maturity and better and greater distribution of natural fleshing that the beef steer should be selected and the dairy type animal discarded.

Grades of Feeding Cattle. Discarding the dairy type leaves only one general type, viz., beef type to deal with, but immense variation is found within this general class. Ability to select and intelligently buy the type of animal that will make the most rapid and economic gains is a great asset and of utmost importance to the
feeder. Experience and close observation soon teaches that there are certain and fairly definite standard criterions by which the best feed-lot type of cattle may be chosen. Professor Mumford, in his book entitled Beef Production, has divided feeders into the following subclasses, viz., 1. fancy selected, 2. choice, 3. good, 4. medium, 5. common, and 6. inferior.

1. Fancy Select.

"Fancy selected feeders must not only possess the characteristics of choice feeders, but they must be uniform in color, give unmistakable evidence of being high grades of some one of the beef breeds, and in fairly high flesh. 1". Nebraska station has found that the best feeder is one that possesses heavy quarters, a broad back, strong depth of heart girth, large digestive capacity and one that has good quality as indicated by a pliable skin and a soft coat of hair.

2. Choice.

The feeder that grades choice is a low-set, deep, broad and compact individual. This type conformation almost invariably denotes good feeders capable of early maturity. They should be broad, deep and compact, because this conformation indicates strong constitution, capacity for growth and for producing ultimately a relatively high percentage of the high priced cuts. The choice feeders have broad, flat backs and long, level rumps. They have low flanks, straight top and underlines which are nearly parallel. Their eyes should be large, prominent, but mild. This is a denotation of a quiet temperament and low maintenance requirement. Short, broad

1Mumford, in Beef Production.
heads and short thick necks are desirable. The lower jaw should be well muscled, the nostrils and lips large. Choice feeders should show general refinement or smoothness. They are the smoothly made and well rounded sort. There is a correlation between the handling quality and the economy and rapidity of gains. Good handling quality indicates that the possessor is a good feeder. By good handling is meant a skin that is mellow and loose. At least it definitely indicates that the animal is in a thrifty, healthy condition and capable of taking on flesh.

3. Good Feeders.

"Good feeders possess only to a limited degree the beef blood, thrift and conformation of choice or selected feeders." They are quite often lacking in the most desirable characteristics of ideal feeders. Very often they are upstanding, narrow, light or heavy in bone. Frequently they approach coarseness or roughness.

4. Medium Feeders.

"Medium feeders possess a fair amount of beef blood. Generally the beef blood color predominates. Taken as a whole they lack in thrift, quality and ruggedness.

5. Common Feeders.

A common feeder, as the name indicates is decidedly deficient in quality, is narrow, upstanding, lacking in natural fleshing and quite often carries the color of its dairy ancestors.

6. Inferior.

The inferior feeder is rough, angular, bare of musculing, has a dairy conformation and is decidedly lacking in vigor and quality.

Relative Efficiency of Different Grades of Steers

1Bul. 90 111. Agr. Exp. Station
<table>
<thead>
<tr>
<th>Grades</th>
<th>Grain Per Steer</th>
<th>Total Gains 16 Steers</th>
<th>Total Dry M Consumed</th>
<th>Dry matter Per# of gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fancy</td>
<td>460</td>
<td>7362</td>
<td>73267</td>
<td>9.95</td>
</tr>
<tr>
<td>Choice</td>
<td>455</td>
<td>7284</td>
<td>88093</td>
<td>12.09</td>
</tr>
<tr>
<td>Good</td>
<td>419</td>
<td>6705</td>
<td>81017</td>
<td>12.08</td>
</tr>
<tr>
<td>Medium</td>
<td>381</td>
<td>6095</td>
<td>79535</td>
<td>13.05</td>
</tr>
<tr>
<td>Common</td>
<td>395</td>
<td>6322</td>
<td>75875</td>
<td>12.00</td>
</tr>
<tr>
<td>Inferior</td>
<td>350</td>
<td>5607</td>
<td>72494</td>
<td>12.93</td>
</tr>
</tbody>
</table>

Here is a variation of over 31% (460#-350#) in the total gain of sixteen steers under equal opportunities, and what is more significant, a difference of over 30% in the feed required for a pound of gain. Seemingly the better the grade, the relatively larger proportion of the total energy of the ration goes for the production of gain. The economic superiority of the better grades over the poorer ones is due to, first, a relatively smaller maintenance requirement, second, the ability to consume a larger surplus of feed above the requirement and, third, to put on fat in relatively larger proportions on the high priced cuts; this making the more nearly ideal killers type. Hence greater selling prices can be obtained.
CHAPTER III

FEED-LOT TYPES IN SHEEP

Mutton vs. Wool.--The ideal mutton type sheep is one that has a relatively broad and deep body and such a development of head, neck, legs and body parts that the whole conformation suggests symmetry, thickness, compactness and quality. The extreme wool type is markedly different in appearance from the mutton type of sheep. The wool type lacks in straightness or evenness of lines, fullness of outline, and disposition to lay on a great deal of external fat. It is common for the spine to project considerably above the shoulder blades, for the back to sag slightly, for the ribs to be flat, rump to drop sharply. Quite often the body lacks in width and thickness. As the name implies, the wool type has been developed primarily as a wool producing mechanism, while on the other hand the mutton type has been developed primarily for the meat it produces.

The wool type usually has parts of the body on which the skin forms wrinkles or folds. These folds have the advantage of giving more surface to grow wool, but the disadvantage of making a heavy pelt which is discriminated against by the butcher or packer. The wool type as a whole, is rather angular in outline, lacks natural fleshing or muscling; hence this type does not produce the desired
thickness and fatness of mutton that the people demand. This type is rather late maturing, and produces a low dressing percentage of high priced cuts when sent "over the block." Since Merinos have been developed for the specific view of converting feed into wool instead of mutton, they are quite inferior to the mutton breeds as desirable feed-lot types; hence they should be avoided.

**Grades of Sheep.**

In selecting feeder sheep condition, quality, weight, form, age, section of country in which they have been grown, and thrift are factors to be considered. All of the above factors are economic points that should be given due consideration. Why is condition important in selecting feeders? It is important because one of the objects of the purchaser is to make a profit by increasing the value per pound of the original weight through the process of finishing. Quality is important because it means refinement throughout, hence an animal that has excellent quality will give a high dressing percentage when butchered. They are smooth of pelt, and compact of fleece. Packers and butchers pay a premium for the good quality kind. Market requirements are fairly strict as to the weight of various grades. A few pounds over weight or under weight throws the animal into a lower grade than if it were the most desirable weight. Types should be selected so that they are fairly well finished at the most desirable weights. Form should be given due consideration. Animals possessing the correct mutton form are usually good feeders. They put on a comparatively large amount of flesh on the high priced cuts and as a result command near top prices. Some feeders prefer yearlings or older sheep to feed, many prefer lambs. The purchasing price, feeds to be utilized, prospec-
tive selling price are deciding factors. Generally the older the animal, the higher the maintenance requirement. Native sheep should seldom be purchased as feeders, for they are often infected with internal parasites. The sheep that lacks snap and vigor, or has an unhealthy or laggard mood should be avoided. They almost without exception, are uneconomical feeders.

Fancy Selected Feeders.

This class is an unusually small one and is composed entirely of lambs. Their quality, breeding, and age would place them on the market for mutton direct from the range, but for some deteriorating influence that has reduced them in condition. They must be low set, wide, deep, symmetrical, uniform in breeding and markings and show an unusual amount of mutton blood. Their quality, as evidenced by clear-cut features, clean limbs, light and smooth pelts must be practically above criticism.

Choice Feeders.

A choice feeder is one that has the ability to finish into prime or choice mutton, and to produce gains at economical figures. They should be deep, broad, neatly made, of medium length, and low set. This conformation indicates early maturity, strong constitution, capacity for growth, and a likelihood of finishing into an attractive carcass with a relatively high percentage of valuable cuts. The choice feeder should be of medium length rather than very long or very short. Great length is usually attended with general ungainliness and a tendency to finish slowly. The unusually short lamb is often particular and "minky" as to its eating. It frequently presents a paunchy appearance. The choice feeder
should present a clean cut, typy appearance, a skin without folds or wrinkles and wool of moderate weight.

Good Feeders

A good feeder in a desirable condition shows thrift, and some flesh, but very little fat; vigor and health but not undue emaciation. Good feeders are usually coarse and more leggy than those considered choice. This grade often makes gains as good and occasionally better than the choice lambs, but chiefly because of their lack of quality, they do not reach top prices when they are returned as fat sheep.

Medium Feeders

Medium feeders often have heavy pelts. They are often leggy, and angular in form. This grade of feeder is discriminated against chiefly because of lack of quality as indicated by the thick wrinkled skins and dense, heavy fleeces.

Common and Inferior Feeders

The sheep that falls in these classes are under sized, very poor in quality, heavy in pelt, thin in condition, unthrifty, or they are staggy or coarse.
"What kind of Feeding Sheep to buy

After a feeder has decided on the class of sheep that best fits his conditions and experience, he is confronted with the task of selecting the individuals within the class. This selection should be based largely on weight, quality, form and condition. Since this paper deals only with "feed-lot type," weight and condition will be left out of consideration.

**Quality.** Quality holds an important place in the eyes of the experienced buyer. Indications of desirable quality are seen in a refined, clean-cut head, rather small neatly set ears, fine hair about the face and on the legs, small but strong bones, and most important of all, a lack of wrinkles and folds in the pelt. Many feelers use this last characteristic alone in determining quality. Sheep having thick skin that hangs in folds about the neck and throat, and an abundant coating of oily, frequently dirty wool, are said to be heavy-pelted, and are invariably discriminated against by killers, and should be by feelers. In the late winter or early spring, however, feelers who are looking for sheep that can be clipped and short-fed prefer these heavy-pelted fellows, because they are good shearers. The wool can be bought for a comparatively cheap price per pound on the sheep, and sold, after shearing, for a relatively high price. Packing-house buyers make their purchases on mutton qualities alone, and they know that a heavy-pelted sheep is a poorer dresser than one that is light or thin-pelted; hence a lower bid is placed upon it.

**Form:** Form is discriminated against only when it reaches undesirable extremes. Perhaps the two most common instances of undesirable...
able form in feeding sheep are seen in undue legginess and a heavy paunch. Either of these might make undesirable a feeder that was otherwise satisfactory. A desirable form is one that is well balanced, fairly compact, and low down, broad rather than long, and deep and well rounded, showing especially well-developed hind quarters. **Note**---The feeder that is a good judge of quality seldom need concern himself with form.

**Best Type of Feeder.**

"Lambs by Hampshire, Shropshire, Oxford or Southdown sire and out of Long wool---Rambouillet ewe. (There are not so many feeders of this type because lambs so red are usually sold direct from the range as fat lambs.)

Best Type of Feeders Found in Good Numbers---Longwool-Rambouillet cross---and perhaps a slight admixture of Down blood."—Prof. Coffey.

**Comments.** The feeder should keep the following facts in mind:

The strong constitutioned thick fleshed fellows top the market. The lambs must be uniform in size, type and density of wool to present the desired appearance in the sale pen. Constitution is a prime requisite in sheep, whether they are for the breeding pen, feed-lot or show-yard. The extended nostril, strong short neck, wide deep chest, and well sprung rib all indicate that the heart, lungs and digestive organs have plenty of room in which to do their proper and required work. It doesn't pay the average farmer to raise coarse poor feeders or those that fatten in patches, nor does it pay him to raise little bits of things either. The butcher wants the lamb which will dress out the largest percentage of natural flesh in the
most valuable cuts,—the back and hind-quarters. The straight back-ed, wide, thickly fleshed type is the sort most desirable.
CHAPTER IV

FEED-LOT TYPES IN HOGS

Introduction. The recent teniency in type is not meeting universal approval among hog feelers. Breeders of the leading breeds have a teniency to produce a type of hog that is an extreme—the tall, narrow backed, shallow bodied kind. A change from the "old medium type" or "fat back hog of a few years ago, to a hog of greater bone, size and stretch of body met the approval from both the breeder and farmer. A hog that would grow out to marketable weight sooner, produce large litters, forage to better advantage, and continue to grow profitably when it was best to hold him in the feed-lot for a longer time came into favor with but slight opposition. But when an attempt is made by the breeders to develop the extremely tall, narrow backed, shallow bodied type, the feelers confidence in them beyond a doubt begins to rightly wane.

The Feeder. The man who makes a business of feeding many head of hogs, and especially if he buys the bulk of his feed, necessarily has two angles to work from. In buying his feelers, he asks himself two questions—"will they give good return for feed consumed, and will they suit the buyer or butcher."

The hog that is likely to be most economical in the feed-lot is one that has size, vigor, and feeding ability. Is a hog a good
hogs (from the feeders' viewpoint) if it does not develop a middle until nine months or more of age? Experiments, as well as farmers who have had dealings with this type, know their feeding ability is not commensurate with their size, and they cannot in the feed-lot keep pace with their mates that have the deep middles.

Selecting Hogs for Type and Profit. The pork buyer wants weight and fat, and the fat put on an animal of desirable type in order to dress out a high percentage of edible meat. Why do pigs of the same litter differ in weight so very much after they are finished in the feed-lot? The most vigorous pigs will make the largest and most economical gains. It is the big, long, smooth, stretchy dams with plenty of width of head and a deep boiy that produce the thrifty vigorous litters.

It is easy to discuss the best feed-lot type, but the actual attainment of these ends in practice, however, is an extremely difficult matter. It would not be very difficult to breed a herd of hogs which would produce pigs of remarkable ability to grow fast, if we had no other requirements to bother with, and some breeders are apparently doing this very thing. To produce pigs which combine with the capacity for rapid gains, the additional features of quality and early maturity, is to do something which few breeders have achieved. The difficulty of doing this, is increased by reason of the fact that vigor and size seem to be opposed to quality and early maturity when either is developed to an extreme degree.

Must be Good Killing Type.

The kinds of pork which we as consumers desire determines the kind of pork and the kind of hogs most sought for at the markets. All packing house meat is classified and graded in strict accord
to the buying wants of the consumer. Hogs in turn are classified and graded on the availability of their pork to fill these particular meat requirements.

The ultimate end of the hog is the pork barrel and the price received for the finished hog is an important and necessary factor in determining the profits of the business. The market prefers and will pay the highest price for those hogs which will yield a large proportion of dressed to live weight, and a carcass which possesses the weight and quality which pleases the consumer. We recognize that type of finished hog which will give these results to be one which is fairly fat, which is moderately wide and thick of back and loin, deep in his hams and sides, one which is smooth and uniform in his width, neat about the head and jowl, and trim in his underline.

The ideal killers type must have quality and the aptitude to fatten when six to ten months of age.

An Analysis of the Dressed Hog. That percentage of the average hog is represented in the various cuts? This question was recently asked provision experts at the stock yards to find out what qualifications go to make a hog a better commercial commodity. By finding out the percentage of yield of the various cuts, feeders can see what parts of the hog should be most highly developed to make them appear more attractive to the killer.

The regular commercial cuts were taken into consideration, the kind that go over the counter in the butcher shop to the regular trade. To obtain the figures an average hog weighing 200 to 360 pounds was taken into consideration as this well represents the big
end of the marketable size of hogs.

The following table gives a list of cuts and the percentage of the total carcass which they represent. The hog in this instance returned a total yield of 73% or about the average hog dresses.

<table>
<thead>
<tr>
<th>Cut</th>
<th>Percent of Carcass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hams</td>
<td>13</td>
</tr>
<tr>
<td>Shoulders</td>
<td>10</td>
</tr>
<tr>
<td>Loins</td>
<td>10</td>
</tr>
<tr>
<td>Fat backs (salt or pickled pork.)</td>
<td>9</td>
</tr>
<tr>
<td>Belly (breakfast bacon)</td>
<td>12</td>
</tr>
<tr>
<td>Spare Ribs</td>
<td>1</td>
</tr>
<tr>
<td>Head</td>
<td>$4\frac{1}{2}$</td>
</tr>
<tr>
<td>Butts</td>
<td>3</td>
</tr>
<tr>
<td>Feet</td>
<td>$1\frac{1}{2}$</td>
</tr>
<tr>
<td>Lard</td>
<td>8</td>
</tr>
<tr>
<td>Lean Trimmings</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>73</strong></td>
</tr>
</tbody>
</table>

The foregoing table tells the tale of percentages. From the packers it is learned that the hams, bellies, and loins are the most expensive cuts. They are the stable cuts of the hog. The public uses these more generally than the others.

A ham can be used in many ways; hence it is a popular cut. It is a general purpose cut of meat. It is also found that the hams form the largest percentage of the total carcass. The price of hams is generally relatively high. The economical value of the product makes it in great demand. The bellies, which make the bacon, form 12% of the carcass. This product has led the list in selling price, which makes it one of the leaders in selling as well as being
second largest in point of percentage of the total carcass. While the average bacon obtained from a hog runs near 12%, some are heavier, depending upon the thickness of the cut, while others run smaller. However, in the aggregate they are well up toward the top of the list in the percentage column.

During late years bacon has grown in popularity. Its use has become more general and the increased demand has been mainly responsible for the strong position it holds in the price list. Of all the cuts secured from a hog, bacon sells for the most money per pound. Because of the present day popularity of bacon the killers ideal type has probably changed within the last few years. The old fashioned "fat beck" is giving way to a hog not so wide of back, but deeper and longer of side—a type that approaches the bacon type.

The pork loin is a cut that is in much demand. The loins produce the tenderloin, pork chops and loin roast. This, like the ham, is suitable for many ways of preparation and ranks well up in the price list as well as yielding 10% of the total carcass. Three cuts mentioned above in the aggregate form 35% of the average carcass or nearly one-half of the total dressed weight of the hog.

After an observance of the table of percentages it leads one to the conclusion that the hog that will yield the largest percentage of the highest priced cuts is an economical sort to handle for this type command high market prices. A hog that yields a good ham and a good belly for bacon purposes, makes an ideal type from being the packers' viewpoint. While these parts are developed, an animal with a comparatively small head is desirable, for the head has a low market value. The loins generally take care of themselves. A
hogs that is of the type that yield a deep, smooth side will generally yield a popular sized loin.

This same type of hog will produce just a medium or light fat back, not too much fat to make the sale slow, but will generally produce a thin product that is usually the easiest sort to sell.

---

Diagram showing where the cuts come from and the percentage each represents.

**Lard vs. Bacon**—Ten or even five years ago there were two distinct types of hogs, viz., Lard and Bacon. During the last five years there has been a rapid transition in type, especially the lard type, because of a number of economic reasons.

Day, in *Productive Swine Husbandry* (1915) states, "that a fat or lard type hog is characterized by a thick, deep, smooth body, remarkable for its depth and thickness rather than its length. The hams, back, and shoulders should be largely developed. On the
whole the lard type hog should possess compactness of form." Day states: "that in form, the bacon type of hog is very different from the lard type. It is longer in the leg and body, has less thickness and depth of body, and is lighter in shoulder, neck and jowl. The bacon type hog should be long from the back of the shoulder to the ham, but comparatively short from the back of the shoulder to the snout."

The above paragraph is true in the main, yet today, however, the gradual blending of types has made the contrast less sharp than they were a few years ago. Apart from the color, head, ear, and a few other rather distinct breed characteristics, the various breeds are gradually converging in type. Breeders are cognizant of the fact that the proverbial pork barrel is the ultimate end of pork production, and they are trying to satisfy the demands of both packer and consumer, as well as, attempting to get a practical type at the same time. Generally speaking, the packer does not favor any one particular color or breed of hogs more than another, but he does desire a certain definite type of hog. The day of the popular heavy market hog seems to be past. Meat from these hogs was disposed of in the past as "nigger meat" in the South, in the Eastern industrial centers among the poorer people, and in certain European countries. Today we find the Southerner raising more of his own pork. The laborer of the poorer class is able and willing to purchase the same kind of meat normally served on the table of others.

Lard compounds and substitutes have been introduced on the markets of the world to reduce the high cost of living and have somewhat curtailed the normal demand for lard. This of course is
another reason for the decrease in the popularity of the heavy market or the "fat back" hog. Constructive breeders almost without exception are clamoring for a "big type"—a big, growthy, rather upstanding smooth quality hog,—a type that is a medium between the old fashioned "fat back" and the true bacon type. They have learned that this type is far more prolific than the medium type. There seems to be a fairly definite correlation between prolificacy and stretchiness of body conformation. The prolificacy of the present day "big type" Poland compared with the prolificacy of the old, compactly built "medium type" Poland is a good example of the truth of this statement.

Until recently nearly all of the hogs sent to market were fed in the corn belt. This is true to a comparatively large extent today, but not to nearly so large an extent as was the case five or ten years ago. The World War helped to bring about this change. As a result of the war economic conditions of our country changed rapidly. The demand for pork increased. Prices began to soar. Various breed associations staged advertising or breed promotion campaigns. The result is that today we find not only hogs in the corn belt, but a fairly large percent scattered throughout most sections of the United States, outside of the corn belt.

Our Agricultural Experiment Stations have clearly demonstrated that it is unprofitable to feed the hog nothing except corn and water. Some bone building, frame developing feed is an absolute necessity for profitable hog feeding. Corn is extremely fattening and is low in bone building content. Animals fed on corn and water only, gain very slowly and uneconomically after a comparatively
short period of feeding. Those fed corn and water only also have a tendency to grow slowly in frame and produce a relatively large amount of fat. This is exactly the type of hog that the American meat eating public attempts to avoid today.

Education, high corn prices, abandonment of the breweries, and the utilization of more and more by-products of various sorts from year to year have been factors which revolutionized, to some extent at least, the hog feeding industry. The large varieties of feeds help influence the type. Breweries no longer make demand on the barley; hence many hogs are produced in barley growing areas. Whey, until recently was disposed of through the sewers. It has been proven that this by-product of the cheese factory is worth considerably more for hog feeding than the cost of hauling it back to the farm. Swine production is increasing in dairy manufacturing regions. Small potatoes when cooked and mixed with whey, alfalfa or clover leaves, oil meal or barley are exceedingly valuable for growing hogs. Soy beans, cow peas and forages of various sorts are being utilized to a greater extent as time advances. The feeds mentioned above are only a few that are being used to a comparatively large extent today. A few years ago hog feeders utilized but few feeds. Hogs fed a wide variety ration live under different environment from those fed the narrow ration of corn and water. Hence it is logical to assume that hogs fed so differently will gradually change in type.

Since a more varied ration has come into general use, it has been found that the medium type or "fat back," soon finishes or forms too much adipose tissue for the modern American meat eating
public; hence this type is discriminated against. The modern type lard hog, which in reality is a medium between the old lard type and the bacon, can utilize the great variety of feeds and the balanced rations to a better advantage than the medium type, (1) because they utilize their feed in the form of growth rather than fatness and (2) they are larger framed, hence have larger digestive capacity and can utilize a larger quantity of food.

Self feeders, have during the last few years gained ground rapidly. Practically all, or at least a large proportion of the larger feeders use them to economize on labor. The low set, short, compact type that was prevalent a few years ago was not well adapted to the self feeder. They "finished" too soon, at too light a weight.

The utilization of forage crops cheapens pork production. The "medium type" or "fat back" is a docile, slow moving animal. The fatter an animal becomes the more sedentary its disposition. The longer legged, stretchy type is more active, and decidedly better grazers. They undoubtedly utilize a greater amount of forage than does the medium type animals.

When a hog is "finished" it is unprofitable, because it requires a great amount of feed simply to maintain its "finished" weight. Hence when a hog is practically as fat as it can be made, extremely uneconomical gains can be made under the best of conditions. The medium type finishes at a comparatively light weight, unless precautions are taken. Market fluctuations within a comparatively short time vary greatly. If the feeder has a type of hog that finishes rather slowly, but keeps putting on weight in the form of growth, he can quite often tide over to a favorable market. The
approved specimens of the present day "big type" help greatly to solve this problem.

Advantages of the "big type" or a hog that approaches the bacon type.

1. They are more prolific than the medium type.
2. They are growthier, larger framed at same age than the medium type.
3. They are better adapted to the self feeder than the medium type.
4. They are more active, can move easier, than the medium type; hence are better foragers.
5. They can be tided over periods of low markets more economically than the medium type.

Disadvantages of the "Big Type".

1. They have a teniency to throw extremes, the tall shallow narrow bodied type which are invariably hard feeders.
2. They have a teniency to mature or "finish" at a heavy weight and late age.
3. They have a teniency toward coarseness of quality and greater percentage of bone.
4. They produce a lower dressing percentage than the medium type.

Views of Practical Feeders.

More than forty letters containing the following questions were sent to practical hog feeders to get their ideas on the "type" question. Twenty five replies were received.

Questions.

1. Do you prefer the "Big Type"—upstanding, stretchy type for the feed-lot to the finer boned, more compactly built type?
2. Which type makes the most rapid gains?
3. Which type produces pork most economically?
4. Which type does the packer seem to prefer?
5. Do the packers prefer a hog that approaches the bacon type
more than they did five or ten years ago?

6. What are some chief factors that you would observe if you were to select your ideal type of feeder hog? e.g. heavy bone, deep body etc.

7. Do you prefer crossbreds (first cross) or purebreds for feeders? e.g. cross between a Hampshire and Poland or a purebred "Big Type" Polani or Duroc?

8. Should the feeder pay more attention to quality or growthiness and stretch in feed-lot selection?

9. Is the "Big Type" hog as bred by today's breeders an economical and efficient hog for the feed-lot?

10. What do you consider the chief faults of the "Big Type" as a feeder hog? e.g. do not finish at best market weight.

11. Which breed if any do you give preference?

12. About how many hogs do you feed annually?

13. I shall appreciate it very much if you desire to comment or discuss any questions concerning the best feed-lot type of hog.

Facts Revealed By Questionaire.

1. Seventy five percent of the feeders prefer the big type, twenty percent the medium type, and five percent have no preference.

2. The question, which type makes the fastest gains was answered in the ratio of five to three in favor of the "big type!"

3. Seventy two percent of the return answers voted that the "big type" made the most economical gain, eighteen percent thought the "medium type" made the most economical gain and four percent did not vote.

4. Fifty eight percent seemed to think the packer preferred the "big type" in preference to the "medium type."

5. Eighty percent of the answers showed that the feeders thought the packers prefer a hog that approaches the bacon type more than they did five or ten years ago.

6. A rather heavy boned, fairly wide headed, deep bodied, smooth, stretchy, straight coated, active hog approaching the bacon type seemed to be the dominant ideal feeder hog in the minds of most of the feeders.
7. The question as to which they gave preference for feeders, crossbreds (first generation) or purebreds seemed to be evenly divided.

8. Thirty nine percent thought quality should rank above prospect for growthiness in selection of the feeder hog. Thirty three and one third percent did not think that the two could be separated and twenty eight percent favored prospect for growthiness instead of quality.

9. Seventy eight percent thought that the "Big Type" as bred by today's breeders are economical and efficient hogs for the feed-lot. Eighteen percent thought they were positively not economical and efficient pork producers and four percent didn't commit themselves to this question.

11. Polesis, Durocs and Hampshires ranked in the order named as the favorites in the feed-lot.

12. The average number of hogs fed annually by these feeders was 160.

Comments by Feeders.

"The little chubby type of hog finishes out too quickly on self feeders, and that is why I prefer a long type hog. I once used a Tamworth boar on Duroc sows and produced an excellent type of feeder for both range and feed-lot, and the weight was there when weighed. I have bought some Hampshire sows and am going to try out a few of them as feeders compared with the others. I believe that I shall want something along the line of grazers so I can utilize forage crops."* (feeds 250-400 annually)

"Here we use self feeders we find the big type will do better than the medium type. The medium type soon fattens and quits growing. We raised them for years before the big type came in style"—Frank Hicks, Lombard, Illinois. (Feeds 200 head or more annually)

"We like a hog that possesses lots of quality with large bone and frame—not too late maturing. Sold a sow on the Chicago market, Feb. 1919, weight 840 pounds for $172.10. She was never one of those extremely high up-late maturers." J. A. Countryman & Son.—Rochelle, Ill.

*Questionnaire not signed.
"Am managing two small farms one half mile apart. On one I have registered Big Type Polanis; on the other high grade Durocs. I find the Durocs better foragers and earlier maturing, but not as heavy as the Polans. Durocs shipped in January averaged 243 pounds; Polanis averaged 281 pounds. All were last of March farrow and all were fed alike. The heavy hogs sold twenty cents under the light hogs, even the lighter load was too heavy for market toppers."

"The big type can either be marked early or fed longer according to the demands of the market."

"Feeding hogs must first have size. We find it no trouble to get a good finish on most hogs. We have not been able to get them too rough for the packers. We also find that the big growthy hogs get more good of a forage crop than does the small compactly built hog. The small hog gets too fat at an early stage of the feeding period then becomes lazy and will not go out to pasture."

R.L. Steigler, Delavan, Ill.

Note.--The writer has discussed the question of type in hogs with a number of feeders, in Edgar County, Ill.--that feed from two to six carloads per year. They are almost invariably of the opinion that the large framed, smooth sided hog is the most profitable feeder especially during this period of market uncertainty.

Iowa Experiment Station Data.

"This Station has conducted some experiments relative to type in swine. However, we do not care to give any data until our work is more complete.

In general "big type" does not surpass the "medium type" until
the animals weigh more than 225 pounds. After this weight the "big type" surpasses both as to weight and economy of gains."

Kansas Experiment Station Opinion.

"Our experience this year has been that the big type hogs are more rapid gainers on the same amount of feed as the medium type pigs consume. This is merely a matter of observation as we have no exact and definite figures on the matter."—E. F. Ferrin—Associate Professor.

3's. Orion Cherry King 217259

Fourth prize aged Duroc Jersey boar, Ill., State Fair, 1919, also grand champion over all breeds at Richland, Co., Ill., fair 1919. Height 40 in., length 75 in., heart girth 77.5 in., flank 78 in. Actual weight at time photograph was taken 840 pounds.
Note his great digestive capacity. This boar is a very rapid gainer, and is a good representative of the conservative, easy feeding, deep sided, modern "big type" hog,—an excellent type for the breeder and feeder to keep in mind in the selection of a sire. This boar was partly developed and was fitted, shown and is owned by the writer.

Classification of Feeder Hogs. The term "feeder hogs" as applied in the following discussion refers to a hog comparatively thin in flesh,—the sort that is usually purchased by the corn belt feeder to convert corn and various feeds and by-products into pork. The following scheme based mainly on conformation, quality, and size divides the feeder hog into four grades. These grades are not distinct. There are all intermediate gradations which makes it rather difficult to determine where one grade should begin and another leave off.

Conformation is essentially expressed by proportions. It is a term expressing only dimensional relations, of which the ratio of length to breadth and depth are the most important. In a general way conformation may be divided into four types. Assuming that we have four animals of equal trunk length, we may designate these classes as (1). those with relatively deep but narrow bodies; (2). those with relatively broad but shallow bodies; (3). those with bodies that are relatively both broad and deep; and (4). those with bodies that are both shallow and narrow. Using these types as a basis we are able to express the general traits of conformation of an animal.

Quality may be divided into two grades or extremes. Necessarily there will be under this classification all gradations between
these extremes. (1). A feeder hog may be said to be excellent in quality if it possesses smooth, even sides free from wrinkles, well laid hams and shoulders, slightly arched back, straight underline, neat head, strong flinty bone and clear cut, sharply defined features throughout. (2). A poor qualified feeder is one that presents a rough, slouchy appearance. Wrinkly, heavy open shoulders, heavy hams, wasty underlines, and flabby flesh are specific points that classify poor qualified feeders.

By size, I do not mean weight, but the inherent factor for development of growth. A feeder may possess excellent conformation and quality, yet remain a poor feed-lot type simply because it does not possess that inherent factor for growth as the feeding period advances.

Size or Growth: Prospect for growth during the feed-lot period may be divided into two extremes, and all gradations imaginable between these two extremes. A feeder that shows excellent prospect for growth during the feeding period is one that possesses that mellow, young pig like appearance. In other words, if it were a human being we would say that it must possess a youthful appearance. Not only must a high class prospective growthy feeder possess "youthfulness" but also remarkable ruggedness, stretch and size of frame in comparison to its weight. A poor prospect for attainment of size or increase in development of frame-work is one that has an "old look" imprinted strongly on its features—a type that is finely built, or decidedly lacking in ruggedness, stretch and size of frame in comparison to its weight.

Choice Feeder Type

A choice feeder has a relatively deep and broad body, correlat-
ed with this conformation we find rapid gains and usually economical gains due to a low maintenance requirement, rather quiet temperament, a large capacity, and a tendency to be ready for market at any time—early maturity in other words. A feeder might possess the above conformation to near the ideal and yet should not grade as choice, because quality must be considered closely with conformation. The butcher not only wants a hog that will produce a high dressing percentage, but he wants also the type that produces a large portion of its meat in the high priced cuts and good quality meat. The clean cut, smooth, even top and underlined kind is the most desirable from his viewpoint.

A feeder type may be selected that meets the above descriptions for a choice feeder and yet it should not be called choice. It is admitted that the small framed hog—relatively broad and deep is a rapid and economical gainer for a short time. However, this "small type" soon carries considerable fat. The fatter the animal becomes, the higher its maintenance requirement; hence if because of poor markets or some other reason the hogs have to be held for a considerable period they prove uneconomical and inefficient as feeders. The choice feeder must not only possess the above described conformation and quality, but ruggedness and size which admits of growth or development of frame along with fattening throughout the feeding period.

Good Feeder.

Good feeders only too a limited degree the conformation, quality and growthiness of the choice feeders. They should have deep bodies but may be criticised for being somewhat narrow. Some men apply the name "sun-fish type" to hogs of this conformation. They have
not the capacity that a broader backed hog of similar frame has, and generally are somewhat more excitable or active, which increases their maintenance requirement somewhat. A good feeder may be a little rough and coarse, and have a teniency to finish somewhat slowly, but if kept in the feed-lot till finished they grade quite highly when sent to the market. The bulk of the present day "true Big Type" fall in this class.

Medium Feeders.

Medium feeders have comparatively broad, out shallow bodies. They do not have the digestive capacity that the choice or good feeders have and are often "tied in" around the heart girth, or wrinkled along the side. Quite often their coat is rough and indicative of lack of thrift to a more or less degree. They are a type that when finished does not dress out a large percentage of meat from the popular and high priced cuts,—they lack development of side.

Common and Inferior Feeders.

This grade or rather grades includes the feeder that is decidedly off in form, quality or prospect for growthiness,. Extremes—those that are unusually tall and angular,—the narrow and shallow bodied kind should undoubtedly fall in this class. There are really two extremes in this narrow, shallow bodied type. First, the finely built small boned, tall slender type, and second, the heavy boned coarse qualities, tall, slender type. Neither are economical producers of pork (1) they lack feeding capacity— are generally poor eaters, (2). their maintenance requirement is high because of their large body surface and generally nervous, ranty dispositions (3) they are late maturers, (4) they are undesirable from the packers'
view point because the quality of the meat is poor, their dressing percentage is low and the percentage of high priced cuts in comparison to the cheaper ones is low.

**Conclusion.** There are a great many economic factors that enter into the question of the best feed-lot type. The ultimate aim is to produce the popular kind of pork and produce it economically. In order to do this, sectional or local conditions have to be considered, as well as the market requirements. The lessened demand for lard and the increased demand for better quality bacon by the American people, the self feeder, utilization of a large number of by-products and a considerable amount of forage, and the constant enlargement of the hog belt outside the corn belt are factors which have brought about this change of type. Barring a comparatively few communities, handicapped by local or sectional difficulties, our country has been greatly benefited by this change in type movement. The danger lies, however, in carrying this change in type too far; thus sacrificing quality and feeding ability for size, extreme stretchiness or shallowness of body. The hogs that possess considerable scale, stretch and depth of body—not the extreme rangy or shallow belled kind—are excellent foragers, vigorous, prolific and continue to grow profitably when it is best to hold them in the feed-lot for a longer time. The conservative "big type" under most conditions is an excellent feeder type to keep in the foreground as a desirable feed-lot type.
BIBLIOGRAPHY

Following is a partial list of material used in the preparation of this paper. Many other sources have been consulted and some of those have been quoted or referred to in the course of the discussion.

BOOKS

Burkett, C.W., Farm Stock.
Castle, W.E., Genetics and Eugenics.
Child, C.W. Individuality in Organisms (1915)
Coffey, W.C., Productive Sheep Husbandry 1918
Curtis—-, Horses, Cattle, Sheep, Swine.
Davenport, E. Principles of Breeding.
Day, S.E., Productive Swine Husbandry.
Doane, D.H., Sheep Feeding and Farm Management.
Gay,—, The Breeds of Livestock.
Mumford, H. "", Beef Production 1908
Sisson, Sextimus, A Text Book of Veterinary Anatomy.
Stiles, P.G. Nutritional Physiology.
Wells, H.G. Chemical Pathology.
Papers


Gusler, Gilbert, - Some Internal Factors Causing Differences in Differences in Animal Production.

Mendel, L. B. - View points in the Study of Growth, Biochem, Eul. VI 1914, 56-176


Bulletins

Canada- The Bacon Hog and The British Market Pamphlet #31

Colorado Raising Hogs--Bul. 143

California Pork Production Vender Cal. Conditions-Bul. 237

Clemson College.--Swine Husbandry-Ext. Bul. 40

Idaho Hog Raising for the Idaho Farmer-Bul. 74

Ill. Market Classes and Grades of Sheep 1908-Bul. 129

Md. The Beef Cattle Industry in Maryland Eul. 121

Miss. Feeding Beef Cattle in Miss. Bul. 92

Miss. Feeding Beef Steers--Bul. 136


Mo. Corn Silage for Fattening Two Yr. Old Steers-Bul. 112

Mich. Pork Production Club Bul. 5

Nebraska Comparison of Breeds and Types-Bul. 132

Nebr. Economical Beef Production--Bul. 116

N. Car. Feeding Experiments with Beef Cattle--Bul. 219

N. Dak. Pork Production Under N. Dak. Conditions-Bul. 83
<table>
<thead>
<tr>
<th>State</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. Mexico</td>
<td>Utilization of Feed by Range Steers—Bul. 91</td>
</tr>
<tr>
<td>Ohio</td>
<td>Swine Judging for Beginners. Ext. Bul</td>
</tr>
<tr>
<td>Penn.</td>
<td>Steer Feeding Experiments.—Bul. 145</td>
</tr>
<tr>
<td>Purdue</td>
<td>Result of short vs. Long Feeding Periods. Bul. 130</td>
</tr>
<tr>
<td>Purdue</td>
<td>Steer Feeding—Finishing Steers. Bul. 142</td>
</tr>
<tr>
<td>Tenn.</td>
<td>The Relation of Steer Feeding to Farm Economics. Bul. 79</td>
</tr>
<tr>
<td>Texas.</td>
<td>Hog Feeding Experiments—Bul. 131</td>
</tr>
<tr>
<td>Wis.</td>
<td>Pork Production in Wis.—Bul. 342</td>
</tr>
</tbody>
</table>

Periodicals.

The Chester White Journal.
The Duroc Bulletin and Livestock Farmer.
The Hampshire Advocate.
The Poland China Journal
The Spotted Poland China Booster.
The Swine World.
Yorkshire Swine Monthly.