

March, 1916

Circular No. 26

# SUCCESSFUL SWINE RATIONS FOR THE CORNBELT



He ate all the corn he wanted in dry lot, but it was properly supplemented.

AGRICULTURAL EXPERIMENT STATION  
IOWA STATE COLLEGE OF AGRICULTURE  
AND MECHANIC ARTS

ANIMAL HUSBANDRY SECTION

AMES, IOWA

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# SUCCESSFUL SWINE RATIONS FOR THE CORN BELT

By John M. Evyard and W. H. Pew

"Just how much of protein and mineral supplements should be fed with corn to swine of various sizes, ages, and classes" is the big question which this circular considers.

Up-to-date practice is reflected in the rations presented; furthermore, these rations have been tested in actual practical feeding trials under the experimental supervision of the animal husbandry section of the Iowa Agricultural Experiment station.

The amount of concentrated supplements, such as skim-milk, tankage, linseed oil meal, wheat middlings, and others, to feed depends to a very large extent upon whether or not the swine are in dry lot or on high or low protein yielding forages or pastures.

It is quite evident in practice that corn fed swine running in high protein pastures, such as alfalfa or rape, require a minimum of protein and mineral supplement such as skim-milk or tankage; whereas those fed in dry lot or on low protein pastures, such as sorghum and dry bluegrass, demand the maximum. Unfortunately, for about 6 months of the year or from the middle of November to the middle of April, Iowa farmers are compelled by necessity to feed in dry lot because of the absence of green pasturage, due to climate.

To meet practical conditions, the amount of protein and mineral supplements to feed along with corn, are given, both for dry lot and for different pasturage.

## *DRY LOT FEEDS AND FEEDING*

Pigs, as they grow from suckling to marketing days in "greenless" fields and bare lots, secure but little of organic nourishment in addition to that supplied in the feeds allowed by the herdsman. The dry-lot-corn-fed pig does not have the chance of balancing his ration as does the alfalfa-pasture-corn-fed pig, and its comparative requirement for high priced supplemental feeds stands out strikingly.

One little realizes that small, young, weanling pigs, which do best in dry lot on a ration of about 25 pounds tankage to 100 pounds of corn, do equally well on only 5 pounds of the same tankage to 100 pounds of corn on alfalfa pasture, because the pigs eat enough of the high protein and mineral carrying alfalfa to make up the de-



**Fig. 1. THE IOWA SELF-FEEDER IN THE FATTENING YARDS.**  
These dry lot self-fed pigs in the absence of pasture have done well on the economical "Free-Choice" Iowa dry feeding ration of shelled corn, wheat middlings, 60% protein tankage, bone meal, charcoal, and rock salt allowed in separate feeders at free-will.

iciency,—equivalent to the 20 pounds of tankage. It is quite difficult to believe that the pig has eaten sufficient of cheaply produced alfalfa, harvesting it himself, so that it will not require so much supplemental feed, but this represents the facts and emphasizes two very definite propositions:

#### **TWO IMPORTANT FEEDING PRINCIPLES**

1. *The great necessity for a liberal allowance of supplemental proteins and minerals along with corn in dry lot feeding in order that the pig may "grow to the limit" equally as well as if he is fed corn on alfalfa or rape or other good forage.*

2. *The great practical saving in feed purchase money otherwise necessary for the laying in of concentrated supplemental feeds because of the forage,—alfalfa, rape, and others. The forage field is the economical place to grow the pig profitably. In Iowa corn is the most efficient grain to feed with the forage in order to grow and fatten pigs with most profit.*

### **SUCCESSFUL RATIONS FOR ECONOMICAL DRY LOT FEEDING**

#### **I. FATTENING AND GROWING HOGS FOR MARKET.**

1. Suckling Pigs,—5 to 40 pounds (fed in creep).
  - A. Corn 80, tankage 20, salt.\*
  - B. Corn 75, middlings 10, tankage 15, salt.
  - C. Corn self-fed, tankage self-fed, salt.
  - D. Corn self-fed, middlings self-fed, tankage self-fed, salt.
2. Weanling Pigs,—30 to 100 pounds.
  - A. Corn 80 to 85, tankage 20 to 15, salt.
  - B. Corn 75 to 80, middlings 10, tankage 15 to 10, salt.
  - C. Corn self-fed, tankage self-fed, salt.
  - D. Corn self-fed, middlings self-fed, tankage self-fed, salt.
3. Shotes,—100 to 175 pounds.
  - A. Corn 85 to 90, tankage 15 to 10, salt.
  - B. Corn 75 to 80, middlings 15 to 10, tankage 10, salt.
  - C. Corn self-fed, tankage self-fed, salt.
  - D. Corn self-fed, wheat middlings self-fed, tankage self-fed, salt.
4. Hogs,—175 to 250 pounds.
  - A. Corn 92 to 96, tankage 8 to 4, salt.
  - B. Corn self-fed, tankage self-fed, salt.
5. Fat Hogs,—250 to 350 pounds.
  - A. Corn 95 to 99, tankage 5 to 1.
  - B. Corn self-fed, tankage self-fed, salt, and charcoal.

\*All rations given on basis of pounds (or parts by weight) in a hundred total. The salt is to be allowed preferably at free will, as is the charcoal when mentioned.

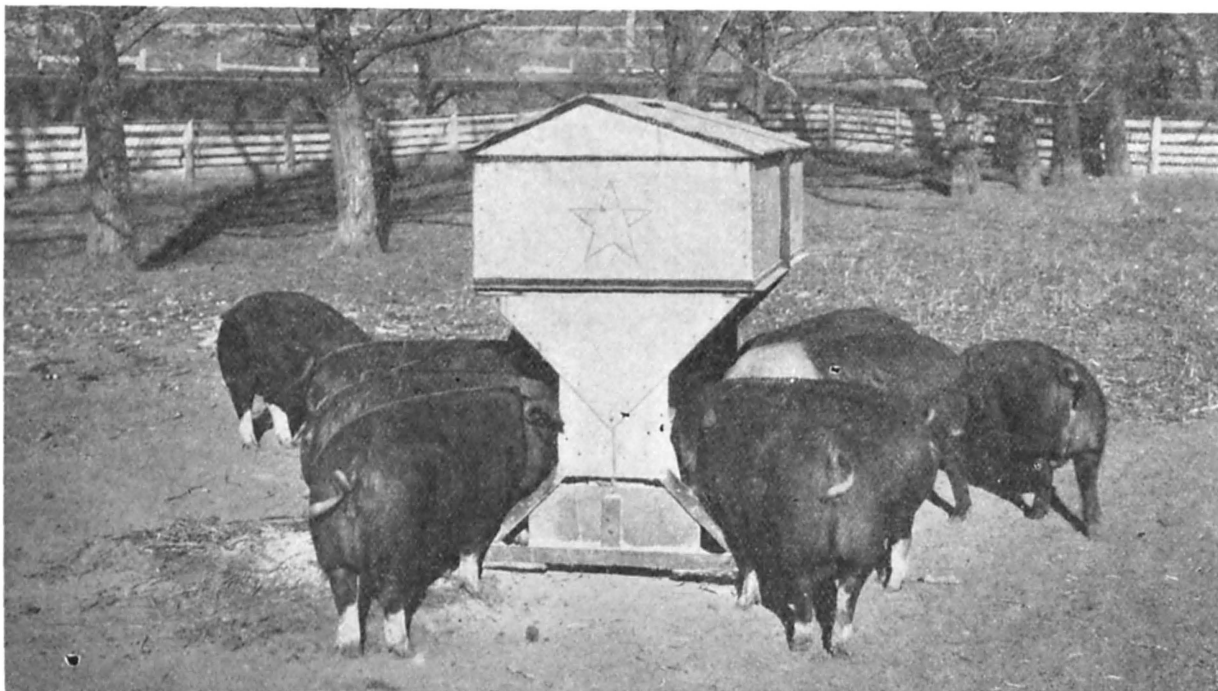


Fig. 2. SELF-FED GILTS DEVELOPING INTO PROFITABLE BREEDING STOCK

These pure bred gilts have an abundance of size for their age. They were self-fed for a considerable time. A good plan to avoid overfattening is to mix ground alfalfa, preferably, or ground oats or wheat bran, with the grain feeds but allow the tankage straight. The tankage can be so mixed if they tend to overeat it, to the extent of half a pound per head daily. The self-feeder is useful not only in fattening but in preparing for breeding.

## II. FATTENING SOWS FOR MARKET.

1. Yearling Sows (Gilts) After Weaning, "Fattening off".
  - A. In Poor Condition, and "Run Down".
    1. Corn 90, tankage 10, salt and charcoal.
    2. Corn self-fed, tankage self-fed, salt and charcoal.

Omit tankage last two or three weeks.
  - B. In Good Condition—Thrifty.
    1. Corn 92 to 95, tankage 8 to 5, salt and charcoal.
    2. Corn self-fed, tankage self-fed, salt and charcoal.

Omit tankage last two or three weeks.
2. Two-year Old or Older Sows after Weaning, "Fattening off".
  - A. In Poor Condition, and "Run Down".
    1. Corn 95, tankage 5, salt.
    2. Corn self-fed, tankage self-fed, salt.

Omit tankage last few weeks.
  - B. In Good Condition—Thrifty.
    1. Corn all will eat, preferably self-fed, salt.

## III. FATTENING STAGS FOR MARKET.

Stags may be fed about same as sows.

## IV. BREEDING SOWS, CARRYING (PREGNANT).

1. At Breeding Time—Flushing to Increase the Number in Litter.
 

Start 10 days before breeding.

  - A. Gilts.
    1. Corn self-fed, tankage self-fed, salt.  
(For a few weeks until bred).
    2. Corn 88, tankage 12, salt.
  - B. Older Sows.
    1. Corn self-fed, tankage self-fed, salt.  
(For a few weeks until bred).
    2. Corn 90, tankage 10, salt.
2. During Gestation or Pregnancy.
  - A. Gilts: Should gain about .6 to 1 pound daily.
    1. Corn 88 to 90, tankage 12 to 10, salt.
    2. Corn 50 to 75, alfalfa 50 to 25, salt.  
To insure consumption, grind and mix.
    3. Corn 65, alfalfa 30, tankage 5, salt.
    4. Corn 30 to 50, skim or buttermilk 50 to 70, salt.
    5. (For self-feeder). Corn, ground, 48; alfalfa, ground, 48; tankage 4; salt. Increase or decrease the alfalfa to govern fatness of sows.

#### IV. (Cont.) BREEDING SOWS, CARRYING (PREGNANT).

##### 2. (Cont.) During Gestation or Pregnancy.

##### B. Sows,—Yearling Sows or Older (Should Gain .5 to 1 pound daily).

1. Practically same as for gilts excepting slightly more corn may be fed, and somewhat less supplement. Old sows can "stand" more alfalfa hay if it is cheap enough.

#### V. SUCKLING SOWS.

##### 1. Gilts and Older Sows.

- A. Corn 70, middlings 15, tankage 15, salt.
- B. Corn, all will clean up with a separate mixture (may be slopped or fed dry) made up of middlings 3 and tankage 1 fed according to appetite, salt.
- C. Corn self-fed, middlings self-fed, tankage self-fed, salt. It may be well to soak some of the corn for the sows with pigs following. Limit the feed first week to 10 days, getting up to a full-feed as quickly as conditions warrant.

### FORAGE FEEDS AND FEEDING

There is considerable difference in the character of the various forages in so far as their supplemental value is concerned. Of all the forages which are practically grown in Iowa and the cornbelt in general the most successful ones, everything considered, given in order of merit are,—alfalfa; red clover or Dwarf Essex rape; bluegrass, preferably mixed with Alsike or white or other clovers; and sweet clover entire first year's or of the early second year's growth.

Alfalfa, rape, and red clover, along with tender bluegrass, are the standard pasture grass-



Fig. 3. SELF-FED ABUNDANT CORN AND  
SALT ON ALFALFA  
Weighed Over 200 Pounds at Six Months.



es of Iowa. Alfalfa, rape, and red clover are the most uniform in general composition from the beginning to the end of the growing season, whereas bluegrass differs markedly in the early spring, as compared to the middle of the summer.

Young, tender, shooting, green, succulent bluegrass, taken just as it begins to come thru the ground, oftentimes runs as high as 35 to 39 per cent protein in its dry matter, but, this period of protein prosperity lasts but a brief time. In a few weeks to a month the protein content drops down to 25 per cent; a little later in the middle of the summer, when it becomes dry and hard, from 8 to 10 per cent protein content in its dry matter is about the average.

Ordinary grazed alfalfa runs from 20 to 30 per cent protein in the dry matter of the edible portion thruout the season and good Dwarf Essex rape will run about the same.

It must be remembered that whereas real young, tender timothy runs high in protein that when this timothy becomes hard and fibrous it is quite low in protein; therefore, much more supplement should be fed in the latter stages of timothy growth than in the earlier ones. This is likewise true of bluegrass.

Fortunately it usually happens that these pastures such as bluegrass, timothy, rye, wheat, and others are especially rich in protein in the rapid growing season of the year, namely:—the spring or the fall following continuous showers, when the pigs are usually little—the spring or fall litters respectively coming on. Of course the very young pigs require a relatively high protein supplement in their ration; and it is luckily fortunate that the young, tender, shooting grass should be high in protein and growing rapidly simultaneously with the young, weanling pigs.

On high protein pastures much less high priced protein supplement is required than when the low protein pastures are depended upon. The rations most successful on the two different general classes of pasture follow.



Fig. 4. HAND-FED LIMITED CORN AND SALT ON ALFALFA

Weighed under 100 pounds at six months. It does not pay to limit the corn ration too severely, it being fed to this pig at the rate of 1 pound per hundred live weight of pig.

## ON HIGH PROTEIN PASTURES

Alfalfa; rape, Dwarf Essex; red, mammoth alsike, and white clover; young tender sweet clover; entire first year's growth and earliest stages of second year; quite early, tender, new coming timothy, rye, or wheat; and short, "shooting", tender, green, succulent bluegrass.

### I. FATTENING AND GROWING HOGS FOR MARKET.

1. Suckling Pigs,—5 to 40 pounds—Creep.
  - A. Corn self-fed, middlings self-fed, tankage self-fed, salt.
  - B. Corn self-fed, tankage self-fed, salt.  
It pays to give the suckling pigs a good start. However, on good alfalfa, or clover pasture they will eat but little tankage.
2. Weanling Pigs,—30 to 100 pounds.
  - A. Corn 0 to 95, tankage 10 to 5, salt.
  - B. Corn self-fed, tankage self-fed, middlings self-fed salt.  
When such pigs are self-fed on luscious, young alfalfa they eat about 94 to 96 corn and 6 to 4 tankage in going from weaning to 100 pounds weight.
3. Shoters—100 to 175 pounds.
  - A. Corn self or hand-fed, salt.
  - B. Corn, self-fed, tankage self-fed, salt.  
On good, high protein alfalfa such pigs will eat about 96 to 98 corn and 4 to 2 tankage.
  - C. Corn self-fed, middlings (only when relatively low in price) self-fed, tankage self-fed, salt.
4. Hogs—175 to 250 pounds.
  - A. Corn hand or self-fed, salt.
5. Fat Hogs,—250 to 300 pounds.
  - A. Corn hand or self-fed, salt.

### II. FATTENING SOWS FOR MARKET.

1. Sows, Fattening off—All Ages.
  - A. Corn hand or self-fed, salt.  
If in poor condition and not doing well feed same tankage or skim-milk or buttermilk until they get nicely started; the gilts will need somewhat more than older sows.

### III. STAGS, FATTENING FOR MARKET.

- A. Corn hand or self-fed, salt.

#### IV. CARRYING SOWS, BREEDING (PREGNANT).

##### 1. At Breeding Time and During Gestation.

- A. Corn with an addition of 5 to 10 per cent tankage until the sows are bred. Then put the sows on corn until about a month before farrowing time comes, when a limited amount of tankage or separated milk may be fed to them so as to encourage milk secretion. This method of feeding will also insure that there will be good strong, lusty, active new-born pigs.

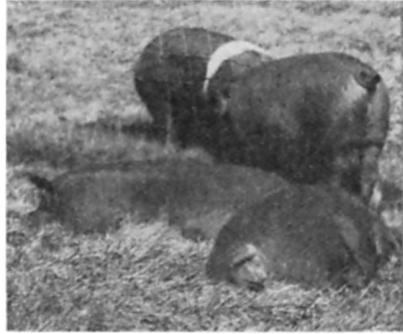


Fig. 5. OVER 200 POUNDS AT 6½ MONTHS

Self-fed corn and tankage and salt in separate self-feeders on bluegrass—Free-Choice System.

#### V. CARRYING SOWS, SUMMERING—TO BE BRED IN THE FALL.

##### 1. Fall Gilts and Yearling Sows.

- A. Corn limited ration, regulate according to gains and conditions desired. Change ration to corn and



Fig. 6. ONLY 72 POUNDS AT 6½ MONTHS

But they had plenty of tankage and salt, yet not enough corn,—only 1 pound per hundred weight daily on bluegrass.

tankage ten days before ing the sows liberally to encourage quick fertilization of many ova, in order to increase the number in the litter at farrowing time.

## ON LOW PROTEIN PASTURES

Dry, hard, fibrous bluegrass; sorghum; feterita; millet; timothy when over 4 inches high; ryè or wheat over 8 inches; or oats and barley over 5 inches, or beginning a couple of weeks before starting to joint; and sweet clover of second year's growth after ten feet high.

### I. FEED PRACTICALLY SAME AS RECOMMENDED FOR DRY LOT

These pastures will, of course, save some grain feed, but they are not high enough or well balanced enough in the substances such as protein, minerals, and essential feed accessories that balance the corn to permit the lessening of the proportion of supplement used.

## "HOGGING DOWN" CORN

Corn is "hogged-down" successfully in 99 of Iowa's 99 counties. The reason is not far to seek,—the pigs are superior corn harvesters. In general those swine best adapted to "hogging-down" purposes are forage grown spring shotes weighing from 100 to 150 pounds. Practically 95 per cent of Iowans who practice the economical "hogging-down" method prefer spring shotes, but, of course, other hogs can be used to advantage; in truth, any class of swine on the farm which are ready for fattening can be successfully turned into the cornfield.

### I. WELL-GROWN FORAGE SHOTES OF 100 TO 150 POUNDS.

- A. Standing corn in which rape, or rye, or wheat, or soy beans, or cowpeas (in south) is growing, salt. Allow tankage if supplemental green feed is not abundant.
- B. Standing corn with run of adjoining field of alfalfa, or clover, or rape, or "luscious," new, tender growth bluegrass, or a happy combination of all these. Salt.
- C. Standing "clean" field corn with tankage fed from a self-feeder, salt.

If fattening sows, or well-grown, heavy-muscled, big boned yearling hogs of the previous fall's farrow, are used very little if any supplemental tankage will be needed,—nor rape, rye, wheat, alfalfa, or other pasture. However, if these pastures are available they may be used to some advantage.

## SOME SUGGESTIONS WHICH MAY SIMPLIFY SUCCESSFUL FEEDING.

1. Ear corn is the best, most profitable all-around corn preparation; of course, shelled corn is excellent for the self-feeders, but ear corn will work splendidly if the self-feeder is paced on a "big enough" concrete, "non-wasting" platform.

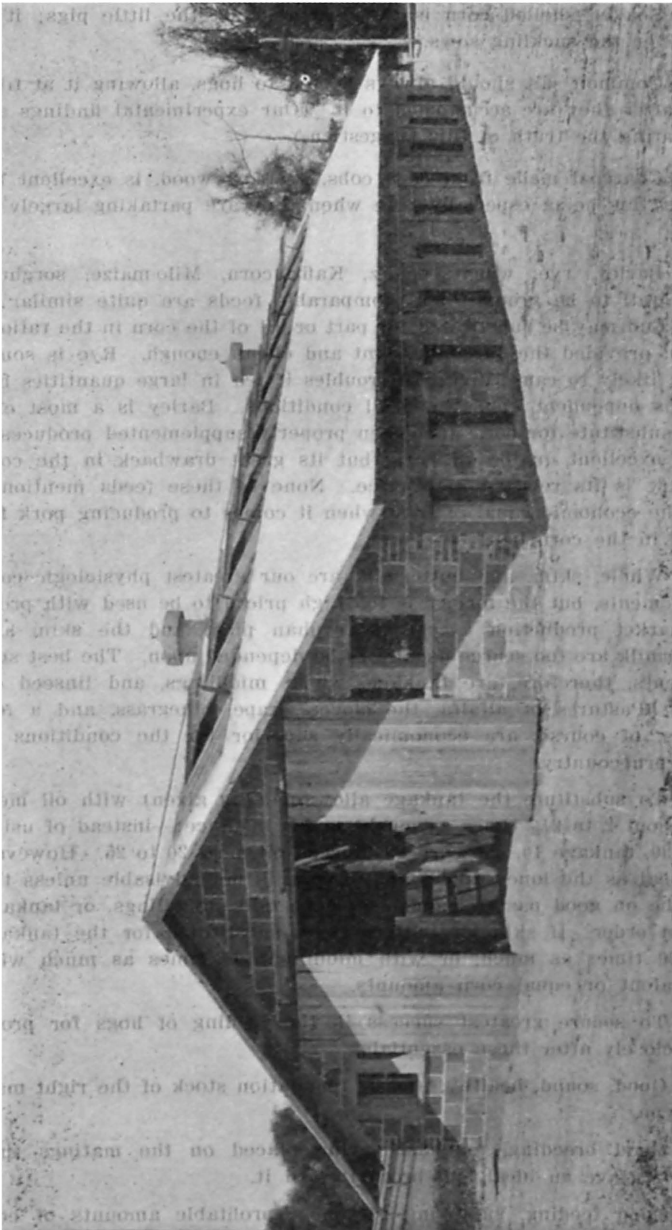


Fig. 7.—GOOD HOUSING, GOOD FEEDING AND GOOD BREEDING ALL COMBINE TO PRODUCE GOOD RESULTS.

2. Soaked shelled corn is excellent to start the little pigs; it is good for the suckling sows.

3. Common salt should always be fed to hogs, allowing it at free-will after they are accustomed to it. (Our experimental findings are indicating the truth of this suggestion.)

4. Charcoal made from corn cobs, or from wood, is excellent for swine, this being especially true when they are partaking largely of corn.

5. Barley, rye, wheat, speltz, Kafir corn, Milo-maize, sorghum seed, (all to be ground) and comparable feeds are quite similar to corn, and may be substituted for part or all of the corn in the rations given, provided they are abundant and cheap enough. Rye is sometimes likely to cause digestive troubles if fed in large quantities but that is dependent upon the local conditions. Barley is a most efficient substitute for corn and when properly supplemented produces a most excellent quality of pork, but its great drawback in the corn country is its relative high price. None of these feeds mentioned are the economic equal of corn when it comes to producing pork for profit in the corn belt.

6. Whole, skim, and buttermilk are our greatest physiologic corn supplements, but the former is too high priced to be used with profit in market production except for orphan pigs; and the skim and buttermilk are too scarce usually to be depended upon. The best supplements, therefore, are tankage, wheat middlings, and linseed oil meal. Pastures of alfalfa, the clovers, rape, bluegrass, and a few others, of course, are economically superior for the conditions in this corn country.

7. To substitute the tankage allowance (as given) with oil meal use about 2 to 2½ times as much, as for instance:—instead of using corn 90, tankage 10, use corn 90, linseed oil meal 20 to 25. However, oil meal as the lone supplement to corn is not advisable unless the pigs be on good pasture, and even here milk, middlings, or tankage are in order. If skim or buttermilk is substituted for the tankage use 20 times as much, or with middlings, 17 times as much with equivalent or equal corn amounts.

8. To secure greatest success in the feeding of hogs for profit look closely after these essentials:

a. Good, sound, healthy, prolific foundation stock of the right market type.

b. Good breeding, emphasis being placed on the matings that "nick". Have an ideal and breed toward it.

c. Good feeding, supplying the most profitable amounts of economical nutriment at the right time. This is a big problem which

demands eternal vigilance as the price of success. Self-watering is part of the successful feeding.

d. Good housing, comfortable, dry, well-lighted, and sanitary at all times.

e. Good, suitable, sanitary (worm and cholera free) range preferable or leguminous or similar pastures.

f. Good general management which will combine and recombine the many factors and forces at hand; the harmonious working of all the units so that the right thing will be done in the right way at the right time is the happy, profitable goal toward which to work.

TO BE MOST SUCCESSFUL IN THE SWINE BUSINESS ONE MUST LIKE IT, PUT HIS HEART INTO IT, YES—AND LIVE WITH IT.