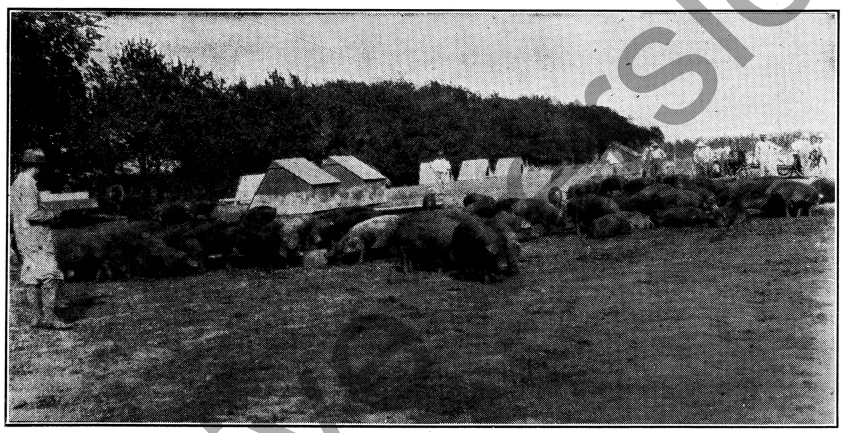
UNIVERSITY OF MISSOURI COLLEGE OF AGRICULTURE

AGRICULTURAL EXTENSION SERVICE

CIRCULAR 416 Columbia, Missouri MARCH, 1940

THE MISSOURI PLAN OF GROWING THRIFTY PIGS

J. W. BURCH



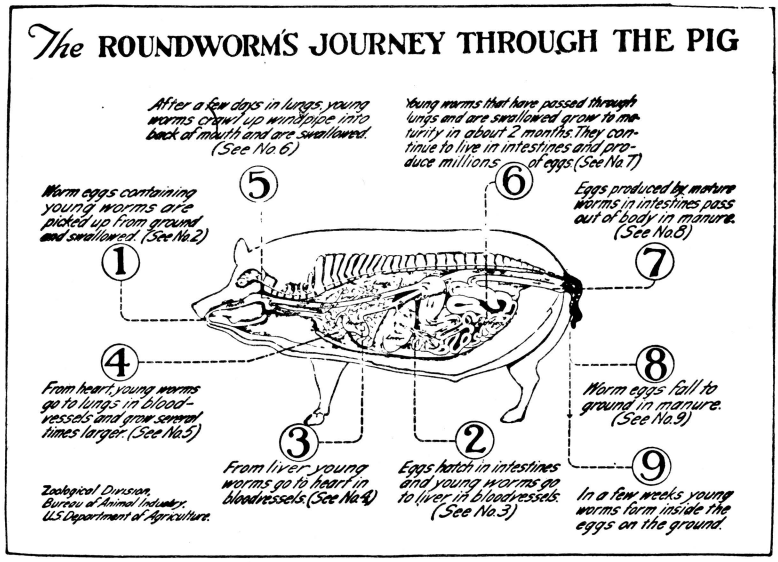
Reuben Yoder produced 142 pigs that averaged 251 pounds each when 180 days old.

It is becoming increasingly difficult in the corn belt to produce thrifty pigs. When the country was new, large, healthy litters were raised because such troubles as worms and necrotic-enteritis were rarely encountered. The constant use of the same fields and lots for a quarter of a century, in hog production, has caused such an accumulation of worm eggs and filth-born bacteria that a good thrifty bunch of pigs now is the exception rather than the rule.

One of the pig's worst enemies is the common round worm (*Ascaris Lumbricoides*). It infests the intestines, causing digestive and other disorders, and so lessens the vitality that the pig becomes readily susceptible to other diseases. The greatest damage is usually done to the pigs while they are small. They may become infested within a few days or even a few hours after birth. The old hog lots become so infested with worm eggs that a handful of the dirt, under a microscope, would be seen to contain thousands of the eggs. The pigs

may pick up these eggs while eating corn with the sow or if the lots are muddy they may take this worm infested dirt off the sow's teats when they nurse.

The round worm's journey through the pig is shown very clearly by the accompanying chart.



Courtesy, the United States Department of Agriculture

THE SANITATION SYSTEM

Much of the injury to the infested pig is done by the irritation caused by worms passing through the lungs, with pneumonia following in many cases. Since the pigs become infested early in life and no treatment can reach the worms in the lungs, the only practical control measure is prevention. In this case the proverbial "ounce of prevention" is certainly worth a pound of cure. The McLean County System as worked out by the U. S. Department of Agriculture, if properly used, is not only effective in preventing round worms but is also the best known method for the prevention of other parasites, as well as many filth-borne diseases such as necrotic-enteritis, bull nose, sore mouth, etc. The system is as follows:

1. Clean farrowing pens thoroughly, and scrub them out with scalding water and lye. Use one pound of lye to ten gallons of boiling water. The lye helps remove the dirt and assists in penetrating the egg so that the boiling water can kill the immature worm inside. Disinfectants have little or no effect on the worm eggs, but help in ridding the pens of lice and mites.

2. Wash the sides and udders of the sows, with warm water and soap, before placing them in the clean pens. Care should be taken to brush them dry in extremely cold weather.

3. Move the sows and pigs out to clean pasture, two weeks after farrowing. It will be best to haul the sow and pigs when it is necessary to cross infested areas.

4. Keep the young pigs on the clean ground until they are four months old. After that they do not seem to be harmed by the worms, and may be put back in the bluegrass lots, if the shade and water are better there than in the clean fields.

PROVIDING CLEAN PASTURE

There are certain problems that must be faced by every farmer before this system of sanitation can be put into practice. Providing clean ground is one of these problems. To make the system permanent and successful, three or four fields must be fenced hog tight and started on a definite crop rotation. Corn—oats—clover, for three fields, or corn—oats—wheat and clover, or corn—corn—oats and clover may be used for a rotation on four fields.

Fig. 3.—Modified A type movable hog house on clean pasture.

To show how this would work one could start with the fall pigs farrowed on stubble clover. This ground should be clean because it has been cropped with corn, oats, and wheat since hogs were on it. The August or September pigs could be left on the clover until December when they will be large enough to be brought into the regular quarters to be fattened during the winter. The following spring this same field can be used for the spring pigs. If the pigs are moved out to the pastures in March they can be carried there

until sold in August or September, or if water and shade are inadequate they can be moved back into the bluegrass pastures, where shade and water are abundant, by July 1 if desired. This clover field has then been used for two crops of pigs and should be plowed deep to cover worm eggs and bacteria. The field should then be put in corn. The cultivation, aided by the hot summer sun, kills out most of the infestation not plowed under. After a crop of corn the field can be sown to oats and clover and then it will be ready for another crop of pigs.

The extra expense of fencing, liming and phosphating, if necessary to insure a crop of clover, will be more than offset by the increased yield of corn, due to the manure from the hogs and the use of clover in the rotation, to say nothing of the saving of corn in feeding healthy pigs as compared to wormy ones.

MOVABLE HOUSES

Another problem is providing shelter on the clean pastures. This is done best by the use of the movable, individual or double hog houses. The Missouri Modified A type house shown in Fig. 3 is recommended. Plans for building these with a bill of material will be furnished, upon request, by the Missouri College of Agriculture, or by any county extension agent. The material for a 6x8 movable house will probably cost from $15 to $20. Native lumber can be used to good advantage for floors, runners and dimension material.

The movable houses may be used in conjunction with the colony house. The pigs may be moved out into the movable houses when two or three weeks old. In case no colony house is available, and the pigs are to be farrowed in cold weather the movable houses may be moved close together, possibly on the south side of the barn that will break the wind. By the use of woven wire, shock fodder or straw may be packed closely around the houses to add to the warmth. A lantern may be hung in the house to add heat, provided it is so hung that it cannot be knocked down or upset. After the pigs are a few days old the houses will be warm enough, and it is then that the sow and pigs may be moved in the house to the clean field. With every house there should be three hurdles to form a pen until the sow and pigs become accustomed to their new home. If only a few sows are turned out each day in the beginning, by the use of the hurdles, they will learn their own houses and the pigs will not mix with other litters and rob the smaller pigs.

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Another problem is encountered in providing water. Ponds should not be used, as they harbor disease. It is hardly probable that every field will have a well in it. Galvanized waterers mounted on runners are quite commonly used. Such a waterer that will hold 100 gallons can be bought for around $20.00. A home-made waterer can be constructed from an empty coal oil barrel and can be mounted on a wooden sled. A water tank mounted on a wagon can be used for large numbers of pigs.

ADDITIONAL PRECAUTIONS

Unless every known precaution is taken the pigs may become infested with worms, even though the sanitation plan has apparently been followed. Surface drainage from old lots to the clean pasture may carry worm eggs enough to infest the entire crop of pigs. The eggs may blow with the dust. Pigs on thoroughly cleaned floors have become infested from dust blown in from old lots around the hog house. The eggs may pass through chickens and birds and still hatch, making possible another means of carrying contamination from one lot to another. The sow will in all probability carry some worm eggs onto the clean surroundings. Sows are quite often spreaders of enteritis, a necrotic condition of the intestines. Troughs and other equipment may also spread enteritis. This disease is even harder to combat than worms. The only practical measure thus far discovered is prevention through sanitation.

The hog producer who expects to succeed without following every step in the plan is likely to be disappointed. There is a possibility that he may be disappointed even though he carried out each step. Many of the best hog producers in the state worm their pigs shortly after weaning time just as a matter of insurance in case the pigs have become infested with worms in some unexpected way. They use the castor oil and American wormseed oil mixture, using 1 part of the wormseed oil to 8 of castor oil. The dosage is ½ ounce to 50 pounds of weight. This treatment will remove worms, will help in case of enteritis and not only will do no harm but will tone up the pig's appetite even if there is no infestation.

SANITATION DOES NOT TAKE PLACE OF VACCINATION

Some have thought that sanitation would remove the necessity of vaccinating for hog cholera. This is not the case. Sanitation will, however, prevent most of the so-called "breaks" and death losses from vaccination. Vaccination of pigs infested with worms

and enteritis may result in considerable loss, but vaccination, by a competent veterinarian, of healthy pigs raised on clean ground should occasion no death loss and very little shrink.

EVERY STEP IN PLAN IMPORTANT

Results secured in Holt county show how important it is to carry out every step in the plan and how difficult it is to secure good results by attempting to do the job halfway. The four points emphasized in the Holt County work were:

1. Clean Sow
2. Clean Farrowing Pen
3. Clean Pasture
4. Push Pigs with Balanced Ration

Many farmers have thought they could leave out one or more of the above practices and still successfully produce hogs. In Holt county the county agent, by means of a questionnaire, received complete reports from 96 farmers as to their hog producing operations. Those that had marketed their hogs at a weight of 200 pounds at an approximate age of 6½ months were considered as having secured satisfactory results. On this basis the following information was obtained:

10 men used 4 practices—The results were 80% perfect.
8 secured satisfactory results.
2 did not secure satisfactory results.
18 men used 3 practices—The results were 61% perfect.
11 secured satisfactory results.
7 did not secure satisfactory results.
15 men used 2 practices—The results were 33% perfect.
5 secured satisfactory results.
10 did not secure satisfactory results.
31 men used 1 practice—The results were 3% perfect.
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22 men used none of the recommended practices.
None reported satisfactory results.

In other words, under Holt county conditions, where worm infestation is very prevalent and where there is considerable trouble from enteritis, a producer has 80 chances out of 100 of producing hogs successfully if he follows all four practices. He has 61 chances out of 100 if he follows three practices. He has 33 chances out of 100 if he follows 2 practices and only has 3 chances out of 100 if he follows only one practice.

Counties starting on the Grow Thrifty Pigs work have made surveys to ascertain the exact conditions relative to the thrift of the pigs. In Holt county a complete survey of three school districts gave the following results:

	15 farms using clean ground	39 farms using old ground
Total sows farrowed	299	759
Number pigs raised	1926	3437
Average No. of pigs raised per litter	6.44	4.52

In accordance with the above findings a farmer who wished to produce a carload of 84 or 85 pigs twice each year, by using the old

system and producing 5 pigs per litter would be required to keep 17 sows. By using the sanitation plan he could produce 7 pigs per litter and would need only 12 sows. He could, therefore, save the keep of five sows and produce the pigs needed. Under average corn belt conditions this would mean a saving of about $30 per sow or $150 per year on the keep of sows alone to say nothing of the saving in corn required to produce a 200-pound hog that is healthy rather than one that is wormy and unthrifty.

IT PAYS TO PUSH THE PIGS

The Missouri Plan of Growing Thrifty Pigs includes certain phases of management other than the sanitation system. It includes the idea that it pays to "push" the pigs to market just as rapidly as possible under practical conditions. There are several reasons why it pays to full feed the pigs.

1. Ordinarily the full fed pig will be the healthiest. He has the vigor and vitality necessary to throw off the diseases that might be contracted by a pig on a maintenance ration. Experienced hog feeders have long realized that a full stomach provided good health insurance for the pig. A pig kept on the farm 6 months has fewer chances of dying on the owner's hands than one kept on the place 10 months if other factors are equal.

2. It actually takes less grain to produce a 200-pound hog if he is full fed than if he is carried along and grown and fattened later. Results at three corn belt experiment stations show that pigs given one-half feed of grain on grass and finished in dry lot required 435 pounds of grain for each 100 pounds of gain as compared to 400 pounds of grain for each 100 pounds gain on pigs that had a full feed all the time. It is true that full utilization of pasture ordinarily cheapens gains on hogs. On the other hand, it is often necessary to finish hogs in a dry lot after being grazed, and gains in a dry lot are more expensive. Also the longer feeding period, as a result of this practice, increases the feed requirements for maintenance. These two factors account for the economy resulting from full feeding.

3. Perhaps the most important reason for pushing pigs lies in the fact that they usually reach the market at a season of the year when prices are higher. The hog producers in Missouri who are making the most money are having their spring pigs farrowed in February and March, pushing them to the August and September market, while their fall pigs farrowed in August and September

are sent to market in March. Figure 4 shows that, one year with another, this system will be the most profitable.

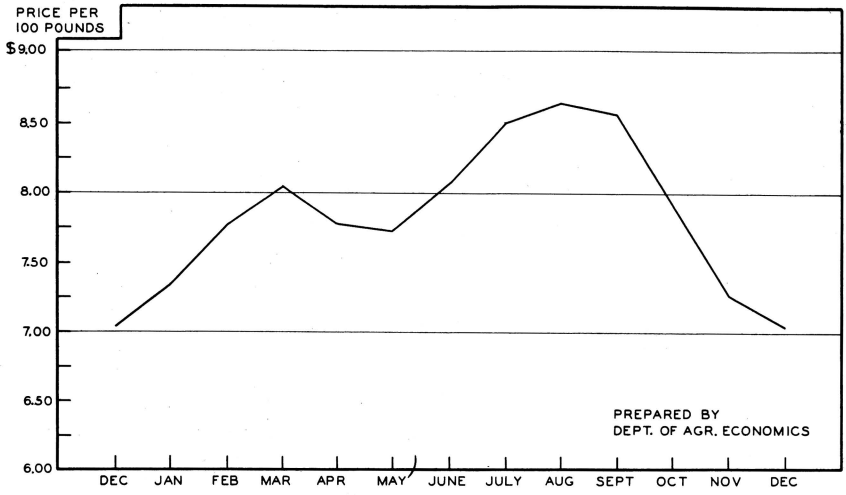

Fig. 4.—Normal seasonal movement of hog prices. Based on prices of good to choice, 200 to 220-pound hogs on the East St. Louis market, hog prices are seasonally lowest in December and highest in August. When hogs are selling at about $7.00 per hundred pounds in December, the price of hogs normally rises about $1.00 from December to March, and the August prices normally average about $1.60 more than the December low.

GOOD PASTURE SAVES GRAIN

In order that the spring pigs may be thrifty and reach the market by the time they are 6 months of age careful attention must be given their ration. It goes without saying that good clover or alfalfa pasture cheapens the gains. Results at the Missouri Station show that 15% of the grain bill on full fed hogs can be saved by the use of good pasture, while as high as 35% of the grain can be saved on hogs fed a limited ration as compared to hogs fed a similar ration in dry lot.

METHOD OF FEEDING PROTEIN SUPPLEMENT

Corn and other cereal grains will ordinarily furnish the fattening portion of the hog's ration in this state. Care should be given the selection of the protein supplement. Skim-milk is one of the best protein supplements, but few hog producers have enough to furnish the required amount of protein. Tankage is probably the most commonly used protein supplement. Excellent results may be secured by placing tankage in one compartment of a self-feeder and corn in another.

When the pasture is good, slightly more economical gains can be made by hand feeding the tankage. A system of feeding used by many hog men in this state entails the hauling of a load of corn out to a thin spot on the pasture and scooping out the corn to the hogs twice daily. Tankage is taken along on the wagon and fed in flat bottomed troughs at the rate of one-half gallon for each bushel of corn fed. The tankage should be fed at the same time and close to the corn. This method of feeding tankage has proven very economical and satisfactory when feeding on pasture.

Healthy pigs fed a corn and tankage ration on good pasture make uniform and economical gains. The following table gives a summary of 10 years demonstration work on Missouri farms. Records are included from practically every major hog producing county in the state. These figures indicate that healthy spring pigs fed

EARLY SPRING PIGS FED ON PASTURE

Year	No. of Demonstrations	No. of hogs	Bu. of corn per 100 lbs. gain	Lbs. tankage per 100 lbs. gain
1925	32	2166	6.09	17.9
1926	50	2909	6.08	20.7
1927	37	2685	6.15	18.8
1928	42	3006	6.10	20.3
1929	47	3032	5.93	21.5
1930	67	5087	5.95	23.6
1931	69	5429	5.94	22.6
1932	41	2697	5.85	20.1
1938	16	982	6.26*	22.6
1939	28	1239	5.34	20.5

*The higher feed requirement to produce 100 pounds gain in 1938 is due to records on three lots of unthrifty pigs. One lot of 106 pigs required 10 bushels of corn, a second lot of 44 head required 8 bushels, and a third lot of 15 head required 8 bushels. This was an average feed requirement of 9.15 bushels of corn. For the remaining 13 lots it took an average of 5.91 bushels of corn which is in line with results of previous years when all lots were thrifty pigs as well as being properly fed.

as described above will put on 100 pounds of gain for approximately 6 bushels of corn and 20 pounds of tankage.

Many protein supplements for hogs are on the market at the present time. Some are too low in protein content and some are too high in crude fiber. Most of them give very good results as far as rate of gain is concerned. The question the farmer should ask himself is whether he can buy protein as cheaply in one of the commercially mixed feeds as he can in milk or tankage. About the only rule that can be given is to buy the feed in which you can get protein at the lowest cost per pound, keeping in mind the quality of the protein. Tankage is 60% protein or has 60 pounds of crude protein in each sack. If a hundred pound sack costs $3.60 then one pound of protein would cost $3.60 ÷ 60 or 6 cents per pound.

Of course, only about 92% of the 60 pounds of crude protein is digestible, but with the exception of milk, practically all other protein feeds have a lower percentage of digestibility. Some such method of comparison should be used on any protein feed before it is purchased.

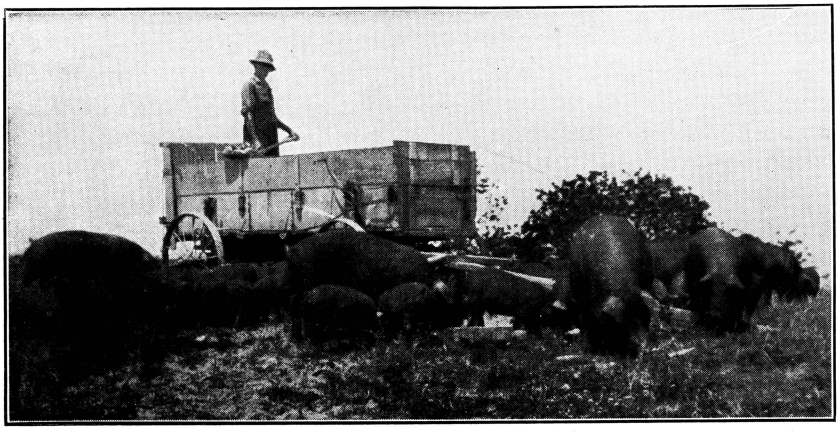

Fig. 5.—Hand Feeding Corn and Tankage.

FEEDING THE FALL PIGS

In the handling of the fall pigs every effort should be made to have them farrowed before October 1. August and September pigs probably give best results. They should be full fed to get as much weight on them as possible before cold weather. Early fall pigs farrowed on clean ground and fed properly will be large enough when cold weather comes to continue gaining instead of barely holding their own in weight, as is so often the case with the average late fall pigs.

FALL PIG FEEDING DEMONSTRATIONS

Year	No. of Demonstrations	No. of hogs	Bu. of corn per 100 lbs. gain	Lbs. of protein mixture
1928	13	732	6.87	29.9
1929	14	788	6.51	33.6
1930	12	643	7.36	30.0
1931	25	1578	6.51	31.3
1932	11	704	6.44	31.5
1939	10	478	6.57	34.6

The fall pigs should have some shorts along with their corn and protein mixture until they weigh fifty pounds. A protein supplement that has given good results with fall pigs is one composed of 200 pounds tankage, 100 pounds linseed oil meal and 50 pounds

green alfalfa meal. This may be self fed or may be hand fed at the rate of 6 pounds or about 1¼ gallons for each bushel of corn fed the pigs. When green pasture is available the alfalfa meal may be omitted. Fine green alfalfa hay fed in racks is just as good and much cheaper when it can be grown on the farm. It is poor economy to buy alfalfa in a sack at $2.00 per cwt. or $40.00 per ton if it can be grown on the farm.

The ration given above has given results that compare favorably with those secured when spring pigs were fed on pasture. The table on page 11 shows the results obtained by Missouri farmers working in cooperation with the College of Agriculture.

The efficiency of the winter ration used in the fall pig feeding demonstration is evidenced by the high average daily gains and the low feed requirement.

MINERAL MIXTURES

Hogs probably will not need any additional mineral if fed tankage on pasture, but the following mixture furnishes a convenient and safe way to salt them and is very inexpensive. The mixture has given good results and can be made by mixing equal parts of finely ground limestone, bone meal and salt. The steam bone meal fertilizer may be used. This mixture should be placed in a feeder and kept before the hogs at all times. Wood ashes and salt also make a very satisfactory mineral mixture.

RESULTS OF GROW THRIFTY PIGS PLAN

The results of Reuben Yoder of Cass county are concrete evidence of the practicability of the Grow Thrifty Pigs plan. Mr. Yoder followed the sanitation system in detail, moving the pigs out into movable houses as shown by the picture on page 1. The pigs had access to excellent alfalfa and clover pasture and were fed shelled corn and tankage until after threshing time in July when ground wheat was substituted for the corn. Self feeders were used even when the sows were suckling the pigs.

One hundred and forty-six pigs were marketed from the 17 sows. These pigs averaged 251 pounds per head at an average age of 180 days. He produced 2153 pounds of pork per litter on the average from his 17 sows.

It required 3.64 bushels of corn, 2.54 bushels of wheat, or 6.18 bushels of corn and wheat combined, and 20 pounds of tankage along with the legume pasture to produce each 100 pounds gain.

The 1939 Missouri Pork Production contest reached a total of 56 hog producers who had a total of 329 sows and 2,722 pigs, or a litter average of 8.27 pigs per sow.

The average weight per pig at 180 days on those receiving awards was 203.15 pounds on 1,110 pigs. The highest average was 267.9 secured by J. W. Mutti, Johnson county, on 37 pigs from four sows.

An interesting set of results was those of J. H. Mudd & Son who produced 8⅘ pigs per litter that averaged 253 pounds with a feed requirement of 5.77 bushels of corn, 5.4 pounds of oats, 4 pounds of bran, and 29.3 pounds of protein. In a previous year they produced 82 pigs from 9 sows that averaged 241 pounds at 180 days, with 5.78 bushels of corn and 27.3 pounds of protein. They have followed the practice of ear-marking their litters for a number of years.

All winners in the contest follow all four steps of the Missouri Plan of growing thrifty pigs.

UNIVERSITY OF MISSOURI COLLEGE OF AGRICULTURE AND THE UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

J. W. BURCH, Director, Agricultural Extension Service
Distributed in furtherance of the Acts of Congress of May 8, and June 30, 1914

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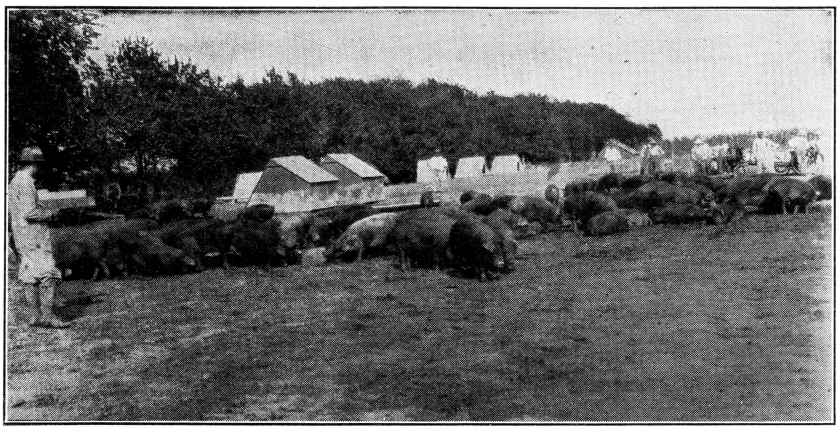

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Average No. of pigs raised per litter	6.44	4.52

In accordance with the above findings a farmer who wished to produce a carload of 84 or 85 pigs twice each year, by using the old

system and producing 5 pigs per litter would be required to keep 17 sows. By using the sanitation plan he could produce 7 pigs per litter and would need only 12 sows. He could, therefore, save the keep of five sows and produce the pigs needed. Under average corn belt conditions this would mean a saving of about $30 per sow or $150 per year on the keep of sows alone to say nothing of the saving in corn required to produce a 200-pound hog that is healthy rather than one that is wormy and unthrifty.

IT PAYS TO PUSH THE PIGS

The Missouri Plan of Growing Thrifty Pigs includes certain phases of management other than the sanitation system. It includes the idea that it pays to "push" the pigs to market just as rapidly as possible under practical conditions. There are several reasons why it pays to full feed the pigs.

1. Ordinarily the full fed pig will be the healthiest. He has the vigor and vitality necessary to throw off the diseases that might be contracted by a pig on a maintenance ration. Experienced hog feeders have long realized that a full stomach provided good health insurance for the pig. A pig kept on the farm 6 months has fewer chances of dying on the owner's hands than one kept on the place 10 months if other factors are equal.

2. It actually takes less grain to produce a 200-pound hog if he is full fed than if he is carried along and grown and fattened later. Results at three corn belt experiment stations show that pigs given one-half feed of grain on grass and finished in dry lot required 435 pounds of grain for each 100 pounds of gain as compared to 400 pounds of grain for each 100 pounds gain on pigs that had a full feed all the time. It is true that full utilization of pasture ordinarily cheapens gains on hogs. On the other hand, it is often necessary to finish hogs in a dry lot after being grazed, and gains in a dry lot are more expensive. Also the longer feeding period, as a result of this practice, increases the feed requirements for maintenance. These two factors account for the economy resulting from full feeding.

3. Perhaps the most important reason for pushing pigs lies in the fact that they usually reach the market at a season of the year when prices are higher. The hog producers in Missouri who are making the most money are having their spring pigs farrowed in February and March, pushing them to the August and September market, while their fall pigs farrowed in August and September

are sent to market in March. Figure 4 shows that, one year with another, this system will be the most profitable.

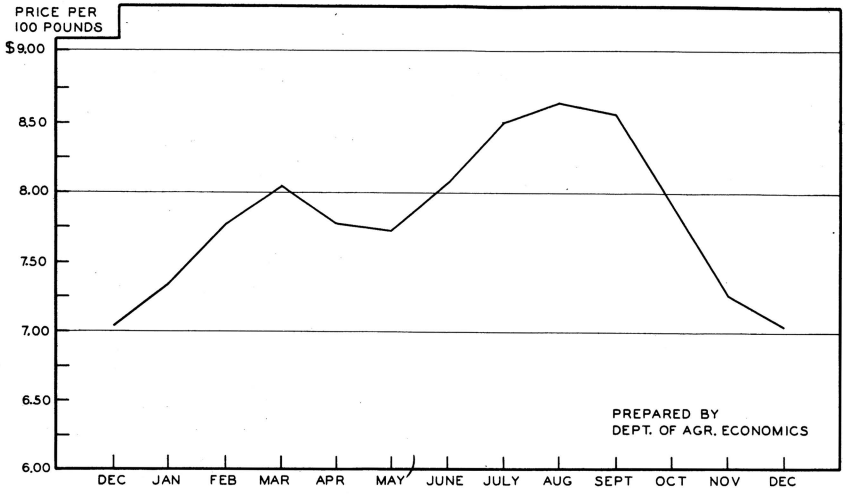

Fig. 4.—Normal seasonal movement of hog prices. Based on prices of good to choice, 200 to 220-pound hogs on the East St. Louis market, hog prices are seasonally lowest in December and highest in August. When hogs are selling at about $7.00 per hundred pounds in December, the price of hogs normally rises about $1.00 from December to March, and the August prices normally average about $1.60 more than the December low.

GOOD PASTURE SAVES GRAIN

In order that the spring pigs may be thrifty and reach the market by the time they are 6 months of age careful attention must be given their ration. It goes without saying that good clover or alfalfa pasture cheapens the gains. Results at the Missouri Station show that 15% of the grain bill on full fed hogs can be saved by the use of good pasture, while as high as 35% of the grain can be saved on hogs fed a limited ration as compared to hogs fed a similar ration in dry lot.

METHOD OF FEEDING PROTEIN SUPPLEMENT

Corn and other cereal grains will ordinarily furnish the fattening portion of the hog's ration in this state. Care should be given the selection of the protein supplement. Skim-milk is one of the best protein supplements, but few hog producers have enough to furnish the required amount of protein. Tankage is probably the most commonly used protein supplement. Excellent results may be secured by placing tankage in one compartment of a self-feeder and corn in another.

When the pasture is good, slightly more economical gains can be made by hand feeding the tankage. A system of feeding used by many hog men in this state entails the hauling of a load of corn out to a thin spot on the pasture and scooping out the corn to the hogs twice daily. Tankage is taken along on the wagon and fed in flat bottomed troughs at the rate of one-half gallon for each bushel of corn fed. The tankage should be fed at the same time and close to the corn. This method of feeding tankage has proven very economical and satisfactory when feeding on pasture.

Healthy pigs fed a corn and tankage ration on good pasture make uniform and economical gains. The following table gives a summary of 10 years demonstration work on Missouri farms. Records are included from practically every major hog producing county in the state. These figures indicate that healthy spring pigs fed

EARLY SPRING PIGS FED ON PASTURE

Year	No. of Demonstrations	No. of hogs	Bu. of corn per 100 lbs. gain	Lbs. tankage per 100 lbs. gain
1925	32	2166	6.09	17.9
1926	50	2909	6.08	20.7
1927	37	2685	6.15	18.8
1928	42	3006	6.10	20.3
1929	47	3032	5.93	21.5
1930	67	5087	5.95	23.6
1931	69	5429	5.94	22.6
1932	41	2697	5.85	20.1
1938	16	982	6.26*	22.6
1939	28	1239	5.34	20.5

*The higher feed requirement to produce 100 pounds gain in 1938 is due to records on three lots of unthrifty pigs. One lot of 106 pigs required 10 bushels of corn, a second lot of 44 head required 8 bushels, and a third lot of 15 head required 8 bushels. This was an average feed requirement of 9.15 bushels of corn. For the remaining 13 lots it took an average of 5.91 bushels of corn which is in line with results of previous years when all lots were thrifty pigs as well as being properly fed.

as described above will put on 100 pounds of gain for approximately 6 bushels of corn and 20 pounds of tankage.

Many protein supplements for hogs are on the market at the present time. Some are too low in protein content and some are too high in crude fiber. Most of them give very good results as far as rate of gain is concerned. The question the farmer should ask himself is whether he can buy protein as cheaply in one of the commercially mixed feeds as he can in milk or tankage. About the only rule that can be given is to buy the feed in which you can get protein at the lowest cost per pound, keeping in mind the quality of the protein. Tankage is 60% protein or has 60 pounds of crude protein in each sack. If a hundred pound sack costs $3.60 then one pound of protein would cost $3.60 ÷ 60 or 6 cents per pound.

Of course, only about 92% of the 60 pounds of crude protein is digestible, but with the exception of milk, practically all other protein feeds have a lower percentage of digestibility. Some such method of comparison should be used on any protein feed before it is purchased.

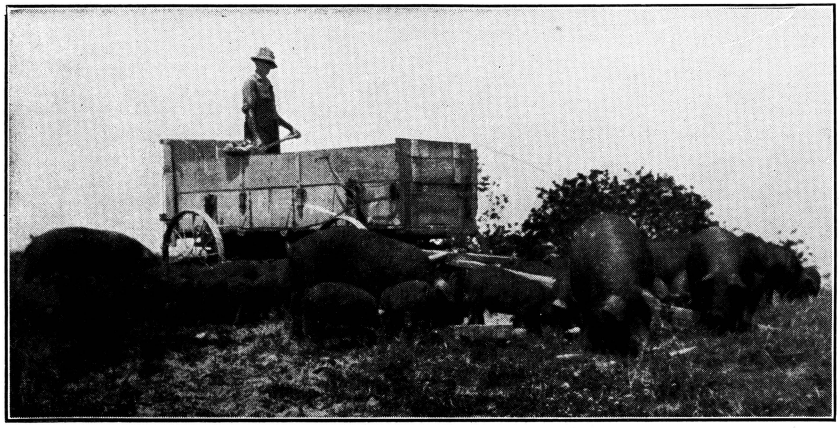

Fig. 5.—Hand Feeding Corn and Tankage.

FEEDING THE FALL PIGS

In the handling of the fall pigs every effort should be made to have them farrowed before October 1. August and September pigs probably give best results. They should be full fed to get as much weight on them as possible before cold weather. Early fall pigs farrowed on clean ground and fed properly will be large enough when cold weather comes to continue gaining instead of barely holding their own in weight, as is so often the case with the average late fall pigs.

FALL PIG FEEDING DEMONSTRATIONS

Year	No. of Demonstrations	No. of hogs	Bu. of corn per 100 lbs. gain	Lbs. of protein mixture
1928	13	732	6.87	29.9
1929	14	788	6.51	33.6
1930	12	643	7.36	30.0
1931	25	1578	6.51	31.3
1932	11	704	6.44	31.5
1939	10	478	6.57	34.6

The fall pigs should have some shorts along with their corn and protein mixture until they weigh fifty pounds. A protein supplement that has given good results with fall pigs is one composed of 200 pounds tankage, 100 pounds linseed oil meal and 50 pounds

green alfalfa meal. This may be self fed or may be hand fed at the rate of 6 pounds or about 1¼ gallons for each bushel of corn fed the pigs. When green pasture is available the alfalfa meal may be omitted. Fine green alfalfa hay fed in racks is just as good and much cheaper when it can be grown on the farm. It is poor economy to buy alfalfa in a sack at $2.00 per cwt. or $40.00 per ton if it can be grown on the farm.

The ration given above has given results that compare favorably with those secured when spring pigs were fed on pasture. The table on page 11 shows the results obtained by Missouri farmers working in cooperation with the College of Agriculture.

The efficiency of the winter ration used in the fall pig feeding demonstration is evidenced by the high average daily gains and the low feed requirement.

MINERAL MIXTURES

Hogs probably will not need any additional mineral if fed tankage on pasture, but the following mixture furnishes a convenient and safe way to salt them and is very inexpensive. The mixture has given good results and can be made by mixing equal parts of finely ground limestone, bone meal and salt. The steam bone meal fertilizer may be used. This mixture should be placed in a feeder and kept before the hogs at all times. Wood ashes and salt also make a very satisfactory mineral mixture.

RESULTS OF GROW THRIFTY PIGS PLAN

The results of Reuben Yoder of Cass county are concrete evidence of the practicability of the Grow Thrifty Pigs plan. Mr. Yoder followed the sanitation system in detail, moving the pigs out into movable houses as shown by the picture on page 1. The pigs had access to excellent alfalfa and clover pasture and were fed shelled corn and tankage until after threshing time in July when ground wheat was substituted for the corn. Self feeders were used even when the sows were suckling the pigs.

One hundred and forty-six pigs were marketed from the 17 sows. These pigs averaged 251 pounds per head at an average age of 180 days. He produced 2153 pounds of pork per litter on the average from his 17 sows.

It required 3.64 bushels of corn, 2.54 bushels of wheat, or 6.18 bushels of corn and wheat combined, and 20 pounds of tankage along with the legume pasture to produce each 100 pounds gain.

The 1939 Missouri Pork Production contest reached a total of 56 hog producers who had a total of 329 sows and 2,722 pigs, or a litter average of 8.27 pigs per sow.

The average weight per pig at 180 days on those receiving awards was 203.15 pounds on 1,110 pigs. The highest average was 267.9 secured by J. W. Mutti, Johnson county, on 37 pigs from four sows.

An interesting set of results was those of J. H. Mudd & Son who produced 8⅘ pigs per litter that averaged 253 pounds with a feed requirement of 5.77 bushels of corn, 5.4 pounds of oats, 4 pounds of bran, and 29.3 pounds of protein. In a previous year they produced 82 pigs from 9 sows that averaged 241 pounds at 180 days, with 5.78 bushels of corn and 27.3 pounds of protein. They have followed the practice of ear-marking their litters for a number of years.

All winners in the contest follow all four steps of the Missouri Plan of growing thrifty pigs.

UNIVERSITY OF MISSOURI COLLEGE OF AGRICULTURE AND THE UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

J. W. BURCH, Director, Agricultural Extension Service
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