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Swine production on Small Farms
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Swine Production on Small Farms

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Cooperative Extension Service, Michigan State University

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Swine raising historically has been one of the most profitable farm enterprises. Small swine operations have often proved to be an effective means of supplementing the family income.

Efficient production can be maintained in small operations. Less expensive facilities can be used. Generally, there are fewer disease and bacterial infections that interfere with performance in small herds than in large ones. More attention can be given to each animal at times when special care is important.

With good management, the average number of pigs per litter is generally higher in small herds than in large units. There are better opportunities to take care of details that help to improve litter size, growth rate, etc.

One of the main disadvantages of small operations is the inability to purchase feed, drugs and other needed items as economically as for large units. However, wise shopping and careful purchase of supplies that will keep for 2 to 3 months helps offset this problem. Sow supplement, salt, minerals and some drugs will keep under proper storage. On the other hand, baby pigs are quite sensitive to musty or moldy feeds, so pre-starter and starter rations should not be purchased in extremely large quantities. These rations store better when purchased in bags than in bulk.

Profit Potential of Small Swine Enterprises

Net income per feeder pig or finished hog varies widely from time to time. Generally, out of every 4-year price cycle period, there is one poor year when it is difficult to make a net profit beyond average farm wages. Then, there will be one year of exceptionally good returns. This is quite often followed by two years of reasonably good profits that gradually decline at the end of the second year.

If an 80 to 90% conception rate is maintained and 8 to 8½ pigs per litter are raised to market, there have been only rare instances when all costs, including interest on investment and labor, could not be recovered from raising swine. Another advantage is that the duration of low profitability has been shorter than for most other farm enterprises.

The most important factors associated with profitability of swine production are the number of pigs per litter sold and the feed required per feeder pig or 100 lbs. of market hog sold. It generally requires marketing 5 to 8 pigs per litter, depending on economic factors at any given time, to pay all costs. Pigs sold per litter above this number are mostly profit.

Limit feeding bred gilts and sows and keeping feeders properly adjusted minimize feed waste and increase profits. Also, raising a large number of pigs per litter not only increases the profit of each litter but improves feed efficiency since it reduces the amount of sow feed charged against each pig sold.

The future looks bright for raising swine, even in small numbers. In fact, this appears to be one of the few farm enterprises that can be profitable in smaller units. This is due to the difficulty of maintaining the level of efficiency (that can be achieved with good small operations) when numbers are increased 2, 5 or 10-fold.

The Breeding Herd

A crossbreeding program is recognized to be superior in raising feeder pigs or market hogs. Litter size, survival and growth rate are improved from 12 to 14% by multiple crossing (using 3 or more breeds) as compared to the average of the pure breeds used in the cross. Using three breeds in a rotational cross is preferred by most producers.



Portable farrowing house.

LYNN D. GOULD
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One of the most popular crosses is Yorkshire, Duroc and Hampshire. Yorkshires are generally recognized as one of the most prolific breeds — they generally farrow and raise more pigs per litter. Durocs grow well on a minimum of feed. Hampshires are one of the meatiest breeds of hogs.

By using a system of rotating from one breed of boars to another from one generation to another through all three breeds and repeating that sequence continuously, a rotational crossbreeding program is maintained. For example, Yorkshire gilts might be selected to start the herd and these mated to a Duroc boar. Gilts selected from this Yorkshire-Duroc cross would then be mated to a Hampshire boar. Gilts selected for replacements from this cross would then be $\frac{1}{4}$ Yorkshire, $\frac{1}{4}$ Duroc and $\frac{1}{2}$ Hampshire. These would then be mated back to a Yorkshire boar to start the sequence again.

Every breed can contribute some useful traits to the herd. Selecting three breeds, one excelling in litter size, one in growth rate and another in meatiness, should result in a successful breeding program. In addition to the three breeds mentioned above, Chester Whites, Spots, Polands, Berkshires and Landrace have all been used successfully in crossbreeding systems. Often, the availability of breeds in a given area helps determine the system of crossing.

For many characteristics, there are often more variations within a breed than between breeds. For example, the most prolific Durocs will farrow more pigs per litter than the least prolific strains of Yorkshires. Not all members of a high growth rate breed are fast growing. Not all of the pigs of a meaty breed are as muscular as some of the heaviest muscled pigs in a less meaty breed.

Improvements can be made by selecting individual herd boars that excel in those traits most needed in a given herd. It is likewise important to place emphasis on selection of these same characteristics in each set of replacement gilts. Quite often, one of the sources of superior boars is the



Farrowing pen in a barn.

Table 1. Recommended Space Requirements.

Recommended Feeder and Waterer Size

- Self feeders — one space per 4 pigs
- Supplement feeders — one space per 15 pigs
- Sow feeders — $1\frac{1}{2}$ to 2 ft. per sow
- Feeding stalls — details on pages 59 & 60 of the Midwest Plan Service Booklet.
- Waterers — one space for each 20 to 25 pigs.

Recommended Floor Space (in a building)

- Gestating sow . . . 15 sq. ft.
- Boar . . . 15 to 20 sq. ft.
- Sow and litter . . . Stall, pen or crate
- Pigs to 40 lbs . . . 3 sq. ft.
- 40 to 100 lbs . . . 4 sq. ft.
- 100 to 150 lbs . . . 6 sq. ft.
- 150 to market . . . 8 sq. ft.

Pasture Space

- 10 gestating sows per acre
- 7 sows and litters per acre
- 25 growing-finishing pigs per acre depending on rainfall and fertility

Shade Space

- 15 to 20 sq. ft. per sow
- 20 to 30 sq. ft. per sow & litter
- 4 sq. ft. per head to 100 lbs
- 6 sq. ft. per head over 100 lbs.

Swine Evaluation Station. Also, some individual breeders collect growth, feed conversion and meatiness data on boars that they sell.

As long as a good selection program is used when each set of replacement gilts is saved for the sow herd and superior boars are acquired, the rotational crossbreeding program can be continued for many, many generations without starting over with purebred gilts again. There is no evidence to suggest that starting over with purebred gilts at any point will contribute anything to the sow herd that selection and rotational crossing cannot successfully accomplish. There is only one instance when it is desirable to maintain a straight breed of hogs. That is to become a purebred breeder to raise and sell breeding stock for use by commercial and other purebred breeders.

Facilities and Equipment

Recommended space requirements are given in Table 1. These figures are taken from the Midwest Plan Service Booklet on Swine Housing which is an excellent source of information on all aspects of buildings and equipment for swine. This is available through the Cooperative Extension Service office in your county.

Breeding herd facilities

It is not essential to provide warm, enclosed housing for the breeding herd. Portable shelters are adequate, even in winter, if properly bedded and

located where drainage moves away from the entrance. Shelters must be closed on all sides with the exception of a small ventilator in the back and an opening or door in front. Each sow needs 15 to 18 sq. ft. for winter housing and the same amount of shaded area in the summer. Old barns and sheds provide satisfactory housing for sows. Concrete floors are not essential but do minimize dust and make it easier to take care of sows. A 2-in. hardwood floor is best for portable houses, but is not essential.

One heated water fountain on a concrete slab per 20 to 25 sows is the best means of providing water. If the slab is large enough, the breeding herd can be hand-fed on the concrete quite satisfactorily.

Farrowing facilities

Most farms have a barn or other building that can be converted to farrowing quarters. Insulation and ventilation are essential parts of a winter farrowing facility. Four inches of batt insulation in the walls and 6 in. in the ceiling are recommended. A small fan to remove stagnant, moist air in the winter is essential. Supply about 5,000 B.T.U.'s of supplemental heat per sow and litter. One good space heater protected from fire danger in the farrowing quarters is desirable. Heat lamps and straw bedding are a serious fire threat. Straw, wood shavings, sawdust or ground corn cobs make good bedding materials. They minimize the amount of supplemental heat needed in the winter.

The farrowing house should be maintained above 60°F, preferably 65°. If it has a partial or fully-slatted floor, 75° is essential to prevent drafts and chilling of pigs.

Concrete floors or concrete slats are preferred in renovating buildings for farrowing. Concrete slats 5 in. wide, spaced 3/8 in. apart, make the most suitable floor, but cost more money. Bedding is generally used in pens with concrete floors while no bedding is used in slatted farrowing crates or pens. Concrete floors should be sloped 1/2 in. per ft. from the front to the rear of the crate or pen to allow for drainage.

Farrowing crates save more pigs per litter than pens with guard rails, particularly if sows farrow unattended. Farrowing crates are usually 5 ft. wide by 7 ft. long while pens are more satisfactory if they are 6 ft. wide by 7 ft. long.

Well insulated portable houses can be used for farrowing most of the year. These are often the least expensive farrowing facilities.

In the one-litter system, where gilts are farrowed anytime from mid-April to October, shades or enclosed shelters provide the least costly facilities. Quonset-type units made from two sections (half circles) of a 7 ft. diameter steel bin make excellent shelters or shades. With a back fastened to them, farrowing has been successfully carried out in cool weather.

Nursery Facilities

Warm, insulated housing is essential for raising pigs from weaning to the 40-60 lb. size. Pigs require 3 sq. ft. each up to 40 lbs., then 4 sq. ft. from 40 to 100 lbs. Supplemental heat is needed in the nursery for taking care of pigs at this stage of life; a temperature of 75° is ideal for pigs from 15-30 lbs., 70° from 30-60 lbs. and 65° from 60-100 lbs. There should be one feeder space per 4 pigs and one water cup per 25 to 30 pigs.

Growing-Finishing Facilities

When raised in enclosed housing, pigs require 6 sq. ft. per head from 100 to 150 lbs. and 8 sq. ft. from then to market. In open housing, where feeders are on concrete outside a building, 6 sq. ft. per pig is needed inside for sleeping and 6 sq. ft. outside for eating. Bedding open shed type facilities will pay. Pigs in open housing grow faster on less feed when bedded in the winter.

Growing swine in pasture fields with shelters is one of the least expensive methods. If pigs are farrowed from April to early June, very little housing is needed in the winter. Shelters to house growing pigs through November and part of December will be necessary.

One feeder space per 4 growing pigs and one water cup per 20 to 25 market hogs are recommended.

Feed Requirements for Swine

Corn and protein supplement are the major ingredients in diets for most classes of swine. The 10 to 20 lb. nursing pig is normally provided with a commercially prepared creep ration. Table 2 lists recommended protein levels for various classes of swine. Table 3 is useful in budgeting corn and supplement requirements for the total swine enterprise.

Feeding, Managing Replacement Gilts

It is best to earmark potential replacement gilts from among the best litters near weaning time. When the final selection is made at 210 to 230 lbs., or at regular market time, the rate of improvement in performance will be greater.

Replacement gilts do best if grown at least a month, preferably two, in an outside lot from the time of selection until breeding. They should be limit-fed 1 lb. of a good sow supplement (38 to 40% protein) and 4 lbs. of corn or the equivalent in other grain per head per day. This would be equivalent to 5 lbs. per day of a 15% protein ration.

It is generally recommended to vaccinate gilts for leptospirosis 3 weeks before breeding to minimize the risk of this reproductive disease. If erysipelas

has been a problem in the area or in the herd where breeding stock was acquired, gilts should normally be vaccinated for this either before breeding or within the last 30 days of pregnancy (but follow manufacturer's recommendations).

Gilts can be "flushed" by self-feeding or hand-feeding 8 lbs. per day 10 days before turning the boar in with them. This induces more to come in heat at one time and tends to increase litter size by about one pig per litter. Breeding gilts on the third heat increases litter size 1½ pigs per litter over breeding on the first heat. They are commonly 7½ to 8 months of age by the time they come in heat the third time. Heat periods occur each 21 days.

Herd Boar Selection, Feeding and Management

It is important that a new herd boar be selected and purchased at least 3 weeks before use. A well-known reputable breeder is the most reliable source of breeding stock. Select a boar that has met good performance standards in an evaluation station or on-the-farm test. Remember, the boar contributes half of the genetic material to the entire pig crop. Beyond a certain level, improvements in growth and feed conversion rates will come only through purchasing performance tested boars that met high standards.

Boars should be hand-fed 4 to 6 lbs. of a 15 to 16% protein ration per day, depending on condition. Leptospirosis and erysipelas vaccinations of boars in the off-season are equally as important as for the sow herd.

A dry, draft-free house is needed for winter and a cool shade for summer. A cool place is an absolute must if the breeding season in hot weather is to be a success. A woodlot is generally preferred during

Table 2. Recommended Protein Levels for Swine.

| Ration | Pig Wt., lbs. | Protein in ration, % |
|----------------------|---------------|----------------------|
| Creep | 10-20 | 18 |
| Starter | 20-40 | 18 |
| Grower | 40-125 | 16 |
| Finisher | 125-220 | 13 |
| Sows & Gilts | | |
| Breeding & Gestation | | 13 |
| Lactation | | 16 |
| Boars | | 16 |

July and August — in some years, this is not cool enough for successful breeding during hot weather.

It is important that the first service of a young boar be successful. Quite often a small sow that is in standing heat is the best way to get him started. A new boar should be handled with care and watched carefully to see that successful breeding is occurring. Sometimes a young boar gains aggressiveness if he is first placed in a lot with a barrow that is smaller than he is.

A young boar under a year of age can be expected to breed no more than 8 gilts or sows when the litters are weaned in a group. A mature boar will service up to 12 in a short period of time. Hand mating two services per female, once at the end of the first day of heat and once at the end of the second day of heat has improved conception rate and litter size over pasture or pen mating.

Feeding, Managing Sows During Gestation

Maximum efficiency is maintained by breeding sows during the first heat after litters are weaned.

Table 3. Estimated Corn and Supplement Requirements for Swine.

| | Avg. Daily | | Per Litter | | Per Pig Raised* | | |
|----------------------------------|------------|-------------|------------|--------|-----------------|--------|-------|
| | Days | Feed Intake | Corn*** | Suppl. | Corn*** | Suppl. | Creep |
| Gilts to breeding age** | | | | | | | |
| Actual Amount | 75 | 5.0 | (329) | (46) | | | |
| Amount required per Sow Replaced | — | — | 82 | 12 | 10 | 2 | |
| Breeding Season | 7 | 7.0 | 42 | 7 | 5 | 1 | |
| Gestation | 114 | 4.5 | 428 | 85 | 54 | 11 | |
| Lactation | 35 | 12.0 | 313 | 107 | 39 | 13 | 10 |
| Starter (20 to 40 lbs.) | 18 | 2.3 | — | — | 32 | 14 | |
| Grower (40 to 125 lbs.) | 56 | 4.5 | — | — | 189 | 63 | |
| Finisher (125 to 220 lbs.) | 56 | 7.0 | — | — | 327 | 65 | |
| Boar (48 litters) | | 6.0 | 40 | 8 | 5 | 1 | — |
| | | | 905 | 219 | 661 | 170 | 10 |

* These amounts are based on 8 pigs raised per litter and 382 lbs. of feed used in the entire swine operation per 100 lbs. of market hogs produced.

** Amount of feed required for gilts to breeding age per sow replaced is ¼ the actual amount needed per gilt because it is assumed that sows farrow an average of 4 litters before being replaced.

***Refer to Extension Bulletin E-357 "Swine Feeds and Feeding" for substituting other grains for corn.



Quonset shelter for field farrowing.

This is generally within 3 to 5 days after weaning.

Many successful producers vaccinate sows for leptospirosis each time they are let out of the farrowing crate or pen. Erysipelas vaccination is generally performed once a year at the same time unless this disease is severe in a herd. In this case, sows should normally be vaccinated during the last 30 days of pregnancy unless the manufacturer of the vaccine recommends otherwise.

Sows need $\frac{1}{2}$ lb. of a good sow supplement and $3\frac{1}{2}$ lbs. of corn or its equivalent per head per day during gestation. If sows are thin from the previous lactation, an additional $\frac{1}{2}$ to 1 lb. of corn per head daily may be needed to get their weight up for the next lactation. However, sows should not be allowed to get fat. This increases farrowing and lactation problems.

It is wise to worm sows during pregnancy to prevent passage of worms into the newborn pigs. This can be performed about 60 days after sows are bred. Dichlorvos or piperazine are two of the popular wormers used during pregnancy. Lice and mange need to be eliminated at the same time. Lindane is one of the most effective treatments but sometimes must be repeated for success.

Sows should be moved into the farrowing quarters on the 109th day after the previous litter was weaned (provided sows were bred on the first heat after weaning). This will allow the sow to become accustomed to the crate or pen for 4 to 5 days before farrowing.

Feeding, Managing Sows During Lactation

Before moving sows in, the farrowing quarters should be thoroughly cleaned and disinfected. This is generally best done right after the previous litters were removed from the unit. Successful disinfecting requires that all manure, bedding and debris from previous litters be thoroughly removed. Sometimes soaking and scrubbing with hot detergent water is essential in cleaning. High-pressure

sprayers that pump 500 to 800 lbs. of pressure per sq. in. are excellent for cleaning swine buildings and floors.

A good disinfectant is essential to prevent bacterial carry-over from one farrowing to the next. Carefully follow directions on disinfectants so that no harsh chemicals are left where the sensitive skin of pigs may come in contact with them.

Sometimes it is necessary to use wheat bran or some bulk in the sows feed to prevent constipation at farrowing time. If bran is used, it should replace half of the regular feed by measure (or $\frac{1}{3}$ by weight). Plenty of fresh water is needed for each sow in the farrowing pen. This is essential at farrowing and throughout lactation.

Sows should be gradually brought up to a full feed during lactation. If they nurse 8 or more pigs, they should consume 10 lbs., or more, feed daily. It is best to feed them as much as they will eat so they can be bred on the first heat after weaning the litter. This eliminates the need for feeding them 21 days to get them in condition to breed again.

A 5-week nursing period is the most popular but the range is anywhere from 3 to 7 weeks. Leaving some litters on the sows longer and weaning the late farrowing ones younger seems to be one of the few ways to help get the sows back into a close farrowing group again.

Feeding, Managing Baby Pigs From Birth to Weaning

Attention to details is essential for success in raising large litters of pigs to weaning. This requires labor and determination. The following practices are not all absolutely essential but the most successful producers perform nearly all of them:

1. Catch each pig at birth, remove the membranes from the nose and start the pig breathing. Breathing is induced by holding a pig up by his hind legs and slapping him on the side. A firm slap is needed but not to the point of bruising the muscles.

2. Clean and dry each pig, clip the needle teeth, cut the tail off to $\frac{1}{2}$ -in., treat with wound protectant, or iodine, tie the naval cord (monofilament fishing line works best), clip the cord off to about $\frac{3}{4}$ -in. long and dip both the cord and tail in tincture of iodine.

3. Place each pig under the heat lamp until farrowing is completed. If the sow continues to farrow for more than one hour, it may be necessary to place the litter on the sow. The level of antibodies which may be absorbed from colostrum decreases significantly with time.

4. Check the sow to see that milk let-down has occurred. If not, it may be necessary to administer a hormone (pituitary extract) to stimulate milk let-down. Be careful with this drug as an overdose has

been known to kill some sows.

5. Make certain each pig receives its share of colostrum milk to protect it from disease and infections.

6. Switch pigs among the litters farrowed at the same time to make them more uniform in size and number.

7. Clean pens daily as needed to prevent manure and bacterial build-up. *Give each pig an iron shot at three days of age in the ham or neck muscle. This should be in the form of iron dextran or iron dextrin and supply 100 to 150 mg. of elemental iron. IRON IS AN ABSOLUTE MUST TO PREVENT ANEMIA, POOR PERFORMANCE AND DEATH OF SOME PIGS.*

8. Supply gilt litters and litters on poor nursing sows with a pre-starter feed when pigs are 7 days of age.

9. Furnish a starter for litters where sows are nursing well at 7 to 10 days of age. Place only small amounts out at a time. Pellets become stale and unpalatable in a day or so. Supply all the feed pigs will eat (self feed).

10. Some highly palatable feeding forms of iron help get pigs started onto feed and eliminate the need for a second iron shot.

11. Castrate boar pigs at 2 to 3 weeks of age. Disinfect the area before castration and spray the wound with a disinfectant. Pens must be kept clean during the healing process to prevent bacterial infection from castration.

12. Identify potential replacement gilts from the largest litters of most uniform pigs. This is indicative of the heaviest milking sows.

13. Wean at 4 to 6 weeks and continue to provide a good pelleted 18% starter ration in a self-feeder.

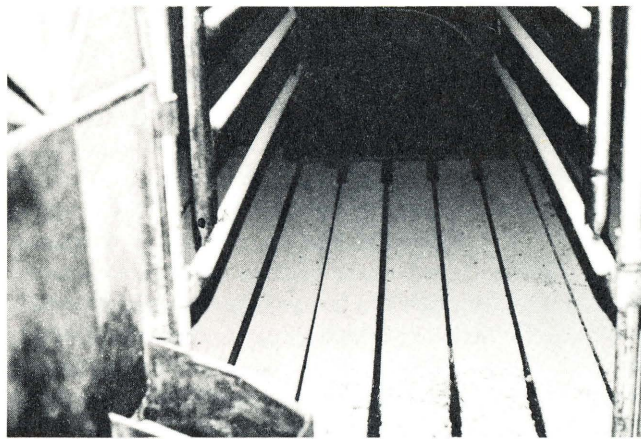
14. Switch the pigs to a 16% corn and supplement or corn-soybean meal fortified ration when pigs reach 30 lbs.

15. Vaccinate the pigs for erysipelas one to two weeks after weaning.

NOTE: For more complete details on ration formulation and feedstuffs, see MSU Extension Bulletin E-537 "Swine Feeds and Feeding."

Selling Feeder Pigs

Feeder pigs generally command the best prices when sold at 40 lbs; however, sometimes in the fall buyers prefer heavier feeders. Large lots of uniform



Farrowing crate with slatted floor.

pigs free of lice and mange with a fresh hair coat command the best prices. When pigs are well-bedded or kept in clean housing, their appearance is improved. Washing and oiling feeder pigs in warm weather often makes them look sharp and sell for a higher price.

Feeding, Managing Pigs from Weaning to Market

Growing pigs should be full-fed at all times from before weaning to market weight. This is the most efficient feeding system.

Good meaty pigs require a 16% ration up to 125 lbs. and a 13% ration from that point to market. However, when the cost of supplement is high in relation to corn, and with average or below average quality of pigs in terms of meatiness, the 16% ration is generally fed up to 75 lbs., a 14% ration is then fed from 75 lbs. to 125 lbs. and a 12% finishing feed used thereafter. Careful attention is needed to ensure that adequate floor, feeder and water spaces are supplied growing-finishing swine; otherwise, performance may be unsatisfactory. One feeder space per 4 hogs and one water cup per 25 are adequate. When pigs are overcrowded, tail-biting, ear-chewing and injuries are more evident. However, when the essentials are supplied to pigs, there generally is no more than a 2 to 3% death loss from 40 lbs. to market. The main needs are keeping the feeders full and taking care of a sick pig as soon as it needs help. When all of the essentials are carried out with determination, raising swine can be a pleasure as well as an economic success.

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