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Guide to Raising Healthy Pigs

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Swine production has long been a staple of Wisconsin agriculture. Like many other parts of the upper Midwest, Wisconsin's swine industry has changed over time and, in many cases, has come full circle. Hogs have been an integral part of many farming operations for years. Swine producers have long thought of their operations as the proverbial "mortgage lifters" for their farms.

The swine industry started with most farms having a few hogs to supply pork for the family table. Over time, many swine operations changed to meet changing family needs. Many backyard operations still feature farrow-to-finish operations in which the animals are raised from birth to market hog (around 6 months of age and 265 pounds) and are then sold to market. However, many operations focus on only one part of the process. Feeder pig producers have farrowing operations and sell their pigs when they reach 40–60 pounds. Market hog finishers buy feeder pigs privately or through sale barns, finish the animals to market weight, and sell them to market. Farrowing operations require more labor and investment than simple market hog operations.

In recent years, the industry has changed to include both larger operations with confinement buildings and smaller family-sized operations that fill niche markets with their pigs. While swine production on any scale offers the opportunity for rewards and risk, there is still room for everyone in this fast-paced industry.

Facilities

The choice of facility type primarily involves a balancing of capital investment, labor requirement, and management expertise. Animal and worker welfare are primary concerns for producers, regardless of the type of facilities chosen. The key to good swine care rests more on the producer's ability to properly manage housing than it does on the specific type of housing provided. Using existing facilities is one way a small operation can produce pork economically. An old dairy barn or machine shed with a concrete floor is a good place to start. Whatever the facility, housing must supply adequate space for each pig (table 1).

Table 1. Swine space requirements

Type of floor	Nursery pigs (20–60 lbs)	Growing pigs (60–150 lbs)	Finisher pigs (150–265 lbs)	Gestation sows
Solid	3–4 sq ft	6 sq ft inside 6 sq ft outside	8–10 sq ft	11–12 sq ft inside 11–12 sq ft outside
Partial slotted	2–4 sq ft	5–6 sq ft	8 sq ft	14–16 sq ft
Totally slotted	2–4 sq ft	5–6 sq ft	8 sq ft	14–16 sq ft

Pork Industry Handbook, Housing #55

For farrowing a sow, use an A-frame or portable hut in the pasture. Single housing units provide isolation for farrowing and the ability to move to clean ground or pasture in the warmer months of the year. Sandy pasture soil makes this system work, as the water drains through the soil instead of creating mud holes. Farrowing in the cold months requires heat lamps or mats for the newborn pigs. Deep-bedded straw and/or a corner hover can provide piglets the opportunity to get away from their mother so they do not get laid on and crushed.

Temperature is important for pig survival, so pigs may need supplemental heat in winter months. The optimal temperature varies based on the age of the pigs: 80°F–85°F for piglets, 70°F–75°F for just-weaned pigs, 60°F–70°F for grow finisher pigs, and 60°F for sows and boars.

Finishing pigs will keep a sleeping area clean if they have enough room to dung in a drafty area by the water source and if feed is available in a self-feeder away from drafts. Be sure to provide enough waterers for the number and size of pigs (table 2). The self-feeder should allow four pigs per feeder hole for grow finisher hogs (table 3). Many self-feeders used on small hobby farms are old and have poor adjustments. Because feed comprises more than 65% of the cost of raising pigs, feeders should be adjusted to allow a small amount of feed in the trough at all times. Too much feed in the trough will allow pigs to root it out and scatter it on the floor by the feeder. If the feeder cannot be adjusted, put it on bricks or blocks of wood to raise it off the floor. The pigs should have to reach up into the feeder to eat, preventing them from playing in the feed and wasting it.

Reproduction

Biosecurity may be the most important factor to consider when starting your herd. It is important to buy sows and gilts (young female swine) that come from reputable sources to help prevent disease and other problems from entering the farm. The same holds true if you decide to purchase or rent a boar for breeding. Sharing boars between multiple operations increases the potential for disease to enter into the operation. The profitability of keeping a boar on your farm will also need to be addressed. If you cannot or do not want to deal with a boar, artificial insemination (AI) is certainly an option and even has some advantages: it minimizes disease risk, is convenient, and allows for the selection of superior genetics.

Good reproductive management of your herd will be important to your success. Genetics will influence important traits such as litter size, litter weights, growth rate, feed efficiency, back fat thickness, pork quality, and structural correctness.

Gestation

If you plan to farrow at a specific time of year, you must consider the timing of when you breed your sows. The information that follows should help you make that timing decision. The estrous (heat) cycle in sows and gilts is the time between the onset of one estrus and the onset of the next. The cycle length is normally 21 days but can range from 18 to 24 days. Length of estrus, or heat, varies and may last from only 12 hours in gilts to 60 hours or more in sows.

The average gestation length, or time from conception until farrowing, is 114 days (3 months, 3 weeks, and 3 days). During gestation, the piglet grows into a fully formed individual, weighing from 3 to 3½ pounds.

Table 2. Pigs per nipple waterer

Pig weight (lbs)	No. of pigs
12–30	10
30–75	10
75–100	12–15
100–finish	12–15
Sows & boars	12–15 head

Pork Industry Handbook, Housing #32

Table 3. Pigs per feeder space

Pig weight (lbs)	No. of pigs
12–15	2
25–50	3
50–120	4
120–280	5

Pork Industry Handbook, Housing #32

Litter size and generation intervals

While many factors may influence the size of the litter, an average litter size in the United States is approximately 10. Weaning of piglets can take place from 10 to 70 days of age, depending on the operation. A typical weaning age falls between 28 and 35 days for smaller producers. However, larger confinement systems may wean between 14 and 30 days. Most sows will return to their estrous cycle within 4–6 days, with some exceptions for early-weaned sows and sows that just weaned their first litter. Therefore, it is possible to have sows producing two litters a year.

There are many resources available that discuss reproduction in more detail, and it is important to remember that each operation will be unique. Determining how you are going to deal with reproduction in your situation will be an important step in your whole farm plan.

Nutrition and feeding

Working closely with your feed supplier will be valuable throughout the early stages of your operation. Feed is the major production input in the pork production process. In fact, feed accounts for more than 65% of all production expenses. Dietary needs for pigs vary by age, weight, and specific function of the animal being fed. Swine rations are typically formulated using cereal grains as base ingredients because they are low in fiber and high in energy. Required nutrients are energy, protein, amino acids, minerals, and vitamins.

Usually, the first feed offered to pigs is a specialized creep feed, given to pigs before they are weaned. This pelleted feed is formulated as a complete ration and provides high levels of protein and the amino acid lysine. As the pigs get older, most people switch to a grind-and-mix feed to provide nutrients for the pigs. As a general rule, it is more economical to have feed delivered in large quantities and in bulk rather than bagged. Of course, this may not be possible in a very small operation.

When your sows are in gestation, they usually need only 4–6 pounds of feed per day, unless it is very cold or the pen is full of manure, mud, or dust and the sows are unhealthy. During lactation, a sow can eat 7–17 pounds of feed, with the average being 10–12 pounds. Lack of water, hot weather, or farrowing complications may reduce intake.

Using homegrown grain or other products around the farm is often tempting and cost saving. A supply of old bread, waste candy, or by-products available for free can reduce expenses. Working with a local nutritionist or your county agent can help you formulate the ration for maximum gain. Vegetable scraps and waste milk should be limited. Some waste products can cause poor performance and reduce meat quality. Keep in mind that pigs need amino acids, not protein, to grow and develop.

Breeds

There are numerous breeds of swine in the world. In fact, swine are found everywhere in the world except Antarctica. Many commercial operations have developed a crossbreeding system involving a variety of breeds to optimize reproductive and growth traits. The following information is broken into two categories: maternal breeds and carcass breeds. Each section looks at the overall characteristics and examples of breeds that represent the ability to either raise piglets or produce meat. It is important to note that the breed examples given are a reference or starting point, and most breeds can fit in either category. More information on these and other breeds is available on the Oklahoma State University swine breeds Web site.

Maternal breeds

Maternal breeds are characterized by their ability to produce litters and successfully raise those litters into healthy pigs. Size, disposition, milk production, and other reproductive traits may be considered when choosing a maternal breed. Examples of maternal breeds include Yorkshire, Landrace, Chester White, and Tamworth.

Carcass breeds

Carcass breeds are characterized by their ability to produce a quality meat product. Many characteristics can be looked at when choosing a carcass breed, including feed efficiency, rate of gain, ruggedness, durability, tenderness, lean muscling, and other meat quality characteristics. Examples of carcass breeds include Hampshire, Duroc, Berkshire, Poland China, and Spotted.

Biosecurity for small operations

Preventing the introduction of disease is a constant challenge for all pork producers. It can be particularly problematic for farms on which hogs are either housed outside or have access to outdoor lots, as is often the case in smaller operations. In this circumstance, it is very difficult—if not impossible—to control pig contact with wildlife, stray animals, insects, rodents, and people. Even so, there are some things that can be done to improve the odds of maintaining a healthy herd.

The greatest risk of disease introduction is associated with the addition of new animals. The quickest way to spread disease is through direct contact between infected and non-infected pigs. Isolation of incoming animals affords producers an opportunity to observe them for signs of disease before they are given the opportunity to infect the rest of the herd. It also provides the opportunity for testing and vaccination of new animals and allows them to become acclimated to the health challenges on the farm. All-in, all-out pig flow can also help prevent the spread of disease from pig to pig. While some disease agents can survive in the environment for some time, most are killed fairly quickly as they dry out in sunlight.

Another avenue for disease introduction is the airborne spread of pathogens from another swine operation. Generally, this hazard can be avoided by locating your unit at least two miles from other pigs.

While it is extremely difficult to control pig contact with birds, wildlife, rodents, and insects if your pigs have access to the outdoors, there are some things you can do to minimize the risk. Controlling weeds and vegetation, cleaning up spilled feed and debris, promptly removing mortalities, and eliminating insect breeding areas can all make your operation less attractive to pests.

Every swine operation has some animals that die during the year, from piglets to mature breeding animals. Rendering services, if available in your area, will normally pick up mature animals heavier than 100 pounds. Composting mortalities on site seems to work well. You can obtain specifics at your county Extension office or by visiting reputable pork production Web sites (see the list of additional resources at the end of this publication).

Finally, limiting human and vehicle traffic through your operation can help reduce the risk of disease transmission from those sources. Keep feed trucks, market transport vehicles, and rendering trucks as far from your hog facilities as is practical. Don't allow people who have contact with other swine operations to enter your farm for 24 hours after their most recent contact. If you transport your own pigs to market, be sure to thoroughly clean the vehicle before returning to the farm and use separate clothing and boots to enter the unloading facility. Although smaller swine operations have a significant challenge in maintaining biosecurity, such practices will certainly help.

Manure handling

Manure from swine operations provides an effective, low-cost source of nutrients for crops and pastures. However, manure handling can present a challenge on swine operations. Depending on the situation, manure can be handled as either a solid or a liquid on the farm. Most small operations handle manure as solids, spreading the manure throughout the year using conventional manure handling equipment such as shovels, tractor-mounted loaders, skid loaders, and manure spreaders. Manure consistency varies according to the age of the animals, the type of feeds provided, and the type of bedding used in the operation. Confinement operations concentrate the manure, while manure in pasture operations tends to be less concentrated. Many larger swine operations handle the manure in the liquid form, which calls for different types of equipment and structures for collecting and spreading the nutrients on fields.

Swine manure is a valuable by-product that can be used to enhance field crop production. Here are some useful facts regarding production rates and nutrient contents of swine manure:

- A 150-pound pig produces 9.5 pounds of solid waste per day, or 1.7 tons of manure per year.
- A 150-pound pig produces 1.2 gallons of liquid waste per day, or 440 gallons per year.
- Solid manure contains 7 pounds of nitrogen, 6 pounds of phosphorus, and 7 pounds of potassium per ton.
- Liquid manure contains 17 pounds of nitrogen, 10 pounds of phosphorus, and 16 pounds of potassium per 1000 gallons.
- Swine operations with 100 (150-pound) animals on hand year-round produce 170 tons of solid manure, or 44,000 gallons of liquid manure annually. This manure would supply nutrients for approximately 10 acres of field corn on an annual basis and would require little additional purchased commercial fertilizer to meet crop needs.

Hog behavior and handling

Research, along with common sense, tells us that handling our food animals gently will result in higher levels of productivity. This is certainly true of swine production. In fact, hogs are particularly susceptible to becoming over-excited due to aggressive handling. Outside of daily activities such as feeding or observing hogs for health issues, hogs tend to be handled at specific times in their lives such as processing at birth, castration, weaning and moving to the nursery, moving to the finisher, and marketing. Breeding stock is handled at breeding, pregnancy checking, vaccination, and weaning.

Hogs have a strong natural urge to escape and will try to squeeze through any gap that they detect. They also have a natural tendency to follow each other and maintain visual or body contact. In addition, hogs are very easily frightened. Bright light, shadows, darkness, and loud noise can all startle hogs. Hogs raised in artificial light will often refuse to enter bright sunlight. Eliminate loose equipment, slick floors, moving or shiny objects, and water puddles from the handling area. Also, be sure to avoid aggressive handling behaviors, including using electric prods, yelling or making loud noises, moving pigs too fast or in groups that are too large, overcrowding them, and allowing excessively long periods of inactivity.

Handlers who understand the concepts of flight zone and point of balance will be able to move animals more easily. The flight zone is the animal's personal space, and the size of the flight zone is determined by the wildness or tameness of the animal. Completely tame animals have no flight zone and allow people to touch them. Animals that are not completely tame will begin to move away when the handler penetrates the edge of the flight zone. An animal's flight zone will vary depending on its level of calmness. The flight zone increases in size when an animal becomes excited and is also larger when the animal is approached "head on."

A hog's point of balance is at its shoulder. All species of livestock will move forward if the handler stands behind the point of balance. They will back up if the handler stands in front of the point of balance. Many handlers make the mistake of standing in front of the point of balance while attempting to make an animal move forward in a chute. Groups of pigs in a chute will often move forward without prodding if the handler walks in the opposite direction, past the point of balance of each animal in the chute. It is not necessary to prod every animal. If the animals are moving through the chute by themselves, leave them alone. Often, tapping the side of the chute will prompt them to move.

Remember: When handling hogs (or any livestock), life will be a lot easier if you remain calm, move slowly, speak softly, and move only a few animals at a time.

Marketing

When pigs reach a weight of approximately 265 pounds, producers sell them on a live-weight basis at either terminal markets or auctions. No matter which marketing system you use, prices are generally determined by supply and demand. Historically, there have been few government subsidies to support producers in times of low prices. If supplies are low and/or demand is high, prices will be high. If supplies are high and/or demand is low, prices will be low. Pig prices vary cyclically and seasonally.

Many smaller producers develop a list of customers who buy half or whole market hogs for home consumption. Working with an inspected slaughterhouse can provide price protection for producers who have a limited number of animals. For pigs that are 125 pounds or larger, another option might be to market them for pig roasts or sparnfarkles. Developing outlets for your product can move you from simply accepting prices offered at the market place to actually marketing pigs at a more profitable price.

Additional resources

ADM Alliance Nutrition
www.admani.com/allianceswine

Iowa State University, University Extension—livestock budgets for 2008
www.extension.iastate.edu/publications/fm1815.pdf

NichePork
nichepork.org

Oklahoma State University—swine breeds
www.ansi.okstate.edu/breeds/swine/

Penn State Agriculture Alternatives—Enterprise Budget Analysis
agalternatives.aers.psu.edu/publications/enterprise_budget_analysis.pdf

Pork Checkoff/National Pork Board
www.pork.org or 1-800-456-7675

Pork Industry Handbook, Purdue Extension

Pork Information Gateway
wipork.porkgateway.com

Swine Care Handbook
www.pork.org/documents/swinecarehandbook.pdf

Wisconsin Pork Association
www.wppa.org/ or 1-800-822-7675

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