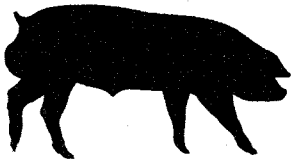
Sustainable Agriculture

Swine System Options for Iowa



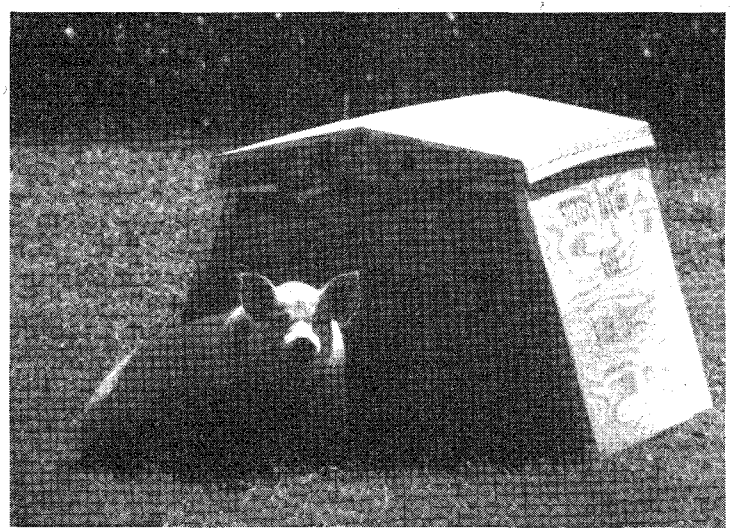
Outdoor pig production: an approach that works

Alternatives to large-scale hog confinement

Swine production is integral to Iowa's agriculture and economy. Despite recent trends toward large-scale hog confinement facilities, many Iowans believe that moderate-sized producers can raise swine profitably using other approaches. A diverse range of livestock production systems involving many modest-sized producers may be preferable to a few large-scale, industrialized confinement operations. Over the long term, such diversity and diffusion can help protect natural resources, producers' profits, rural communities, quality of life for producers and society as a whole, and the quality of pork produced.

Variety in Iowa's swine production approaches is possible largely because swine are so versatile. The lower fixed costs of some production systems can build on this versatility. Research and economic analysis suggest that independent, smaller-scale hog operations can compete in Iowa. But producers need information on alternative approaches, including issues such as marketing, manure handling, and animal husbandry.

To help provide that information, Iowa State University Extension and the Leopold Center for Sustainable Agriculture offer *Swine System Options for Iowa.* This series of publications will offer specific information on alternatives to current industry trends for producing hogs. This first installment describes outdoor alternatives for raising swine.



Inside:

The Leopold Center was created by the Iowa Groundwater Protection Act of 1987. The Center receives state funding from general appropriations and from fees on nitrogen fertilizer and pesticides.

IOWA STATE UNIVERSITY

The public's growing concern about animal welfare calls for innovative approaches and ethical judgment in the ways producers raise pigs.

Why are alternatives important?

Alternative swine production approaches have a place in Iowa agriculture for various reasons. One is the rapid change in the industry. From 1993 to 1994, the number of Iowa hog operations having more than 2,000 head rose by 11 percent, while operations having between 100 and 500 head declined by 18 percent. The trend toward leaner pigs is also strong, and smaller producers need tools to meet this standard. The public's growing concern about animal welfare calls for innovative approaches and ethical judgment in the ways producers raise pigs. Environmentally sound manure handling, with its implications for air and water quality, is of foremost concern to many Iowans. Air quality affects persons living close to odor-producing facilities and/or working in confined areas as well as the pigs in the facilities. Manure application to cropland at rates consistent with crop nutrient needs and water quality protection is essential for the long-term viability of Iowa's swine production, crop production, soil, and water quality.

Most alternatives to the large-scale confinement model rely on keen stockmanship and management skills rather than on resources such as buildings, equipment, energy, feed additives, or labor. The behavior and biology of swine must be taken into account in these systems to ensure their success. The producer's other crop and animal enterprises also need to be closely integrated with the swine enterprise.

"Alternative" does not mean returning to antiquated production methods. Instead, it means combining appropriate technologies into management-intensive systems customized for a specific set of soil, plant, animal, and human resources (usually consisting of a farm and a farm family). These livestock alternatives involve a cropping component in the operation, provide year-round employment, increase financial diversification, distribute risk, and cycle nutrients. Swine are an excellent choice for diversified livestock operations because Iowa's farms grow corn and soybeans—the major feed ingredients for swine—and swine manure nutrients can be recycled onto ample cropland. The swine infrastructure of packing plants, markets, feed companies, veterinary expertise, and knowledgeable, hard-working farmers also is well established.

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Rapid change in the swine industry is providing opportunities for profitable, distinctively Iowan alternative systems of swine production. These competitive alternative swine production approaches have the potential to benefit Iowa's environment, producers, pigs, and rural communities.

Overview

Note: "pasture farrowing" and "outdoor farrowing" are used interchangeably here.

Some Midwest farmers successfully farrow and raise swine on pasture during warmer months in individual, floorless huts. Pigs are fed to market weight on pasture or moved to confinement for feeding. This system of outdoor rearing was traditionally thought to involve high labor, low cost, and low management. Once widespread, outdoor farrowing now accounts for only 5 to 10 percent of Iowa's hog production, although in some areas—Dubuque, Delaware, and Washington counties in Iowa; Henry County, Illinois; and Cass County, Michigan—it is still widely practiced. Recently, outdoor farrowing has increased dramatically in England. Today's outdoor production systems differ markedly from those of the past. Modern outdoor rearing offers advantages that make it a competitive alternative to confinement.

These systems require simple, portable housing; watering systems; and feeders. Pigs and huts are moved with a tractor, loader, hydraulic cart, or all-terrain vehicle. Low cost, portable electric fencing works well. Sows are managed individually within groups with the aid of plastic ear tags. Structures are dispersed over several acres, and animals distribute manure naturally. Straw, corn stalks, or discarded newspapers can serve as bedding. Pasture farrowers typically stock 7 to 15 sows and litters per acre, and labor demand per litter is low. In addition, pasture farrowing provides a more stimulating environment for the sows than do standard confinement systems, and reproductive performance is similar (although this is weather dependent).

Two traditional systems are widely used: the one-litter or all-gilt system and the two-litter system. In the one-litter system, gilts are farrowed once, usually in summer, and sold. Their gilt pigs are raised and bred to farrow one year later. In the two-litter system, sows farrow in spring and fall, generating two litters per year but avoiding summer and winter climate extremes. (A few innovative producers are stretching the pasture farrowing time frame by using insulated huts to farrow in the winter.)

With intensive management, pasture feeding of pigs is a profitable system. To date, investigations show

- lower initial and annual costs for capital improvements,
- minimally higher labor costs,
- lower energy costs,
- fewer odor and manure handling/storage problems,
- slightly poorer weight gain and feed efficiency with outdoor feeding than in confinement rearing, and
- slightly higher costs for feed (and the additional cost for bedding).

Outdoor production also is well suited for sandy, well-drained soils and other land that is marginal for row crop production. Small, low-input, outdoor swine operations can be excellent supplementary enterprises and sources of employment in rural areas.

In short, outdoor production of swine works well for some Iowa producers. The following information can help you decide whether it's right for you.

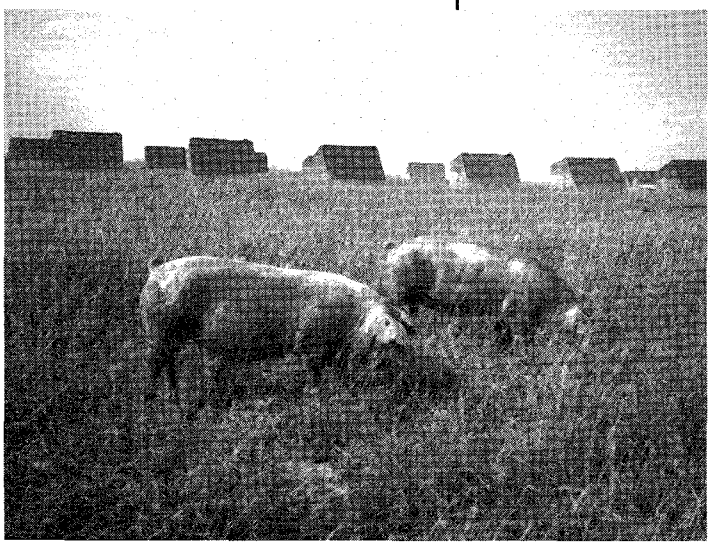
Huts placed on pastures provide for pigs' freedom of movement and distribution of manure nutrients.

Management Strategies

Feeding

Feed currently accounts for 60 to 70 percent of the total cost of producing hogs farrow to finish. It is a major variable between low-cost and high-cost producers.

Lower fixed and production costs of outdoor operations more than compensate for reduced litter size and poorer feed efficiency. Although analysis of Iowa Swine Enterprise records from 1989 to 1993 showed that outdoor farrowing herds required 20.6 pounds more feed per hundredweight (cwt.) of live gain (or 51.5 pounds more feed per 250-pound pig marketed)



than did indoor farrowing herds, this lower feed efficiency may have been due to larger groups of pigs being fed at once because outdoor producers tend to farrow in large groups. Simple facilities often do not moderate the environment as much, and more internal parasite infestations can occur in pigs raised on dirt. Also, much of the feed is consumed during cold seasons (because pigs are born during warm seasons, more feed is needed to maintain body heat months later), and feed may be wasted due to mud, wind, rodents, spoilage, birds, difficulty in keeping feeders adjusted, more gilts in the sow herd, or fewer pigs per sow per year.

Including alfalfa in a corn-soybean rotation can help control crop pests and contribute valuable nitrogen to the soil, reducing commercial fertilizer costs. The alfalfa can be fed to swine, particularly the breeding herd, with good results. Feeding gestating swine alfalfa hay or alfalfa haylage can maintain or even improve reproductive performance.

Grazing: Livestock grazing instead of row crop production can conserve soil and help protect water quality. A recent four-year ISU study investigated the feasibility of grazing gestating swine on alfalfa. Although not widely practiced, presumably because swine are not ruminants, grazing of gestating swine has potential because their energy needs are low relative to their intake and their digestive tracts can utilize fibrous feeds.

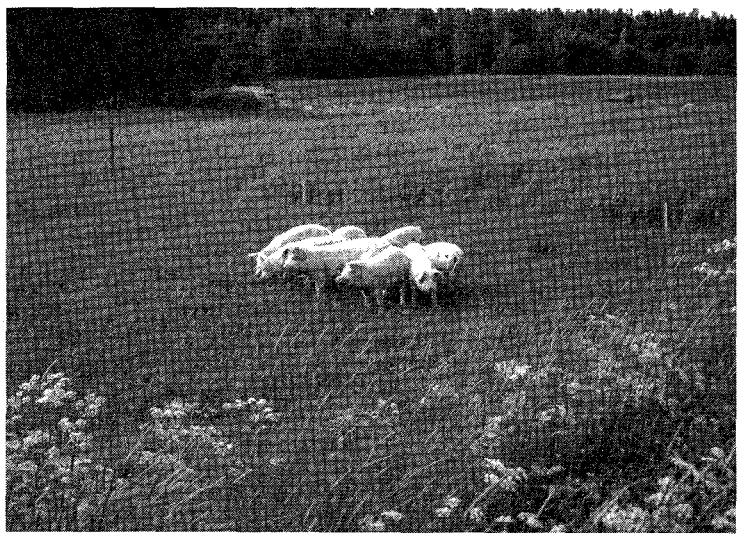
In this study, mid gestation gilts grazing alfalfa needed 1.5 to 2 pounds of corn/day (plus phosphorus and salt) to match the gains of gestating gilts in drylot that were fed 4 pounds/day of a standard corn-soybean meal diet. Daily feeding resulted in higher weight gains than interval feeding. Interval feeding increased alfalfa intake. Reproductive performance was not impaired by alfalfa grazing.

When four-paddock rotational grazing techniques were used (25 gilts/acre/week plus a central drylot with water, shade, and feeding areas) along with snout rings, the alfalfa stand decreased by 0.5 plant per square foot per year.

Overall costs between drylot and grazed gilts were similar. Maintaining gilts on pasture eliminates manure hauling, reduces purchased feed inputs and handling, and includes alfalfa in the crop rotation.

Watering: Either a trough and float or a tank may be used for watering. Self-feeders should be used after farrowing; most sows don't need feed or water carried to their huts. Use low-cost, above-ground plastic pipe to pipe water to pastures.

Stocking rates should be adjusted to account for soil type, slope, rainfall, vegetation, and duration of the system at each location.



Manure

If mismanaged, swine manure can pollute air and water. Yet it can also be the key to nutrient cycling. In confinement operations, high-quality manure is more easily recovered and maintained, but it is more costly

to handle. In outdoor swine production, the swine spread their own manure, and its nutrient value is exploited through crop rotation. Odor is usually not a nuisance with well-managed outdoor swine operations.

Health

Producers who use pasture farrowing often have lower swine health expenses than producers using confinement systems, where the animals' close proximity encourages disease transmission. In pasture farrowing, as well as in alternative production methods that use indoor housing, disease prevention should be emphasized over treatment.

Because the sow has more freedom on pasture, mothering ability is a major genetic priority.

Strict all in/all out grouping of swine is very beneficial to the health status and growth performance of swine. This procedure works best when pigs are born in a narrow time window; this is also important for successful pasture farrowing because it avoids cross-suckling of older and newborn pigs. Proper layout of outdoor facilities can provide this all in/all out advantage.

The majority of swine herds have internal parasites. Because the eggs of many internal parasites (worms) persist in soil for years, rotating pastures and hog lots is not totally effective. Consequently, outdoor herds need a rigorous parasite control program. Injectable, water, and feed dewormers are available. For best results, producers and veterinarians should follow a year-round, whole-herd, life-cycle health program. Post-mortem exams of pigs, fecal samples, slaughter checks, and blood tests can help diagnose the pathogens and parasites active in a given herd.

Iron injections may not be needed on pasture, where pigs can get adequate iron from the soil.

Genetics

Outdoor producers often favor using a percentage of dark breeds or lines (for example, Duroc, Hampshire) in their sow herds' genetic makeup. While these breeds aren't known for maternal traits such as litter size or weaning weights, they are rugged and possibly better equipped to withstand the variable outdoor environment.

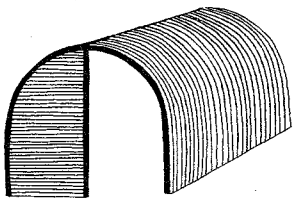
White swine breeds or lines (Yorkshire, Landrace, Chester White), which usually are superior in maternal traits, should form the basis of the sow herd. For outdoor producers, sows with superior leg soundness, overall width, and rib capacity are especially important. Because the sow has more freedom on pasture, mothering ability is a major priority. Other outdoor producers are good sources of seedstock. Artificial insemination is an excellent way to bring in new, superior genetics or extend boar usage during heavy breeding periods.

Choice of housing for swine is usually not based on greater profitability or improved animal performance but on operator preference.

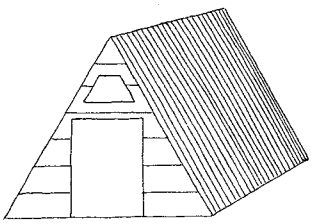
Terminal breeding programs offer maximum hybrid vigor in pigs. Terminal boar breeds or lines should be selected to improve traits related to growth rate, leanness, muscling, or meat quality. The 1995 National Pork Producers Council's National Genetic Evaluation gives a comprehensive, unbiased evaluation of major swine terminal sire lines.

Housing

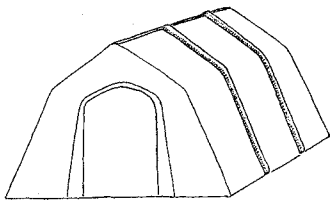
Choice of housing for swine is usually *not* based on greater profitability or improved animal performance but on *operator preference*. Confinement housing substitutes capital (for buildings and equipment) for labor and management. Pro-



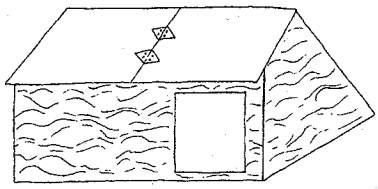
Quonset (curved steel)



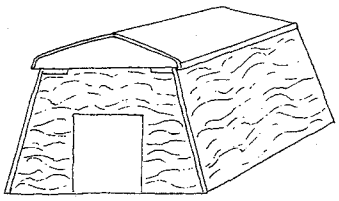
A-frame (wood)



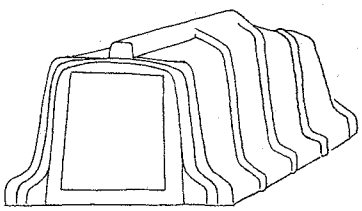
A-frame (plastic)



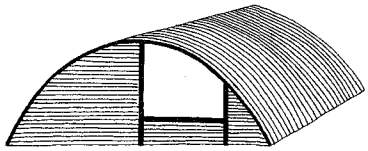
Modified A-frame



Pig-saver (plywood)



Pig-saver (plastic)



English style (steel)

ducers using confinement avoid weather and predator risks, but may increase their financial risks and human health risks from poor air quality and liquid manure handling.

Several types of simple individual farrowing huts are available to producers who farrow pigs on pasture. Hut design, construction, and cost vary, but the primary considerations are the hut's ability to moderate temperature extremes, keep pigs dry and draft free, and minimize pig crushing by the sow.

An ISU study at the ISU Western Research Farm at Castana, Iowa, compared several floorless hut types: a homemade A-frame with a steel roof; two Quonset-shaped steel models (one with an open front and one with a half front and a roller to keep pigs inside); two commercial plywood huts of slightly different dimensions; a steel European-style arc hut, and two types of plastic huts. All huts were bedded with oat straw and faced south. Each hut was equipped with thermometers, and a weather station recorded outdoor temperatures. Highs in huts ranged from about 5.5 to 17 °F greater than the average outdoor high temperature. While A-frame plastic huts recorded the highest temperatures, temperatures for the rest of the huts were similar. Table 1 provides cost comparisons. (Some manufacturers are listed at the end of this publication.)

When choosing a hut type, consider

- Ease of use: does sow have room to enter, farrow, and nurse?
- Ease of access to sow/litter by herd worker.
- Protection from temperature extremes and precipitation.
- Ability to protect pigs from crushing by the sow.
- Portability for moving, placement, and storage.
- Long-term durability; maintenance or repair needs.
- Cost.

At the ISU Western Research Farm, pig crushing losses by hut type were noted during the first 10 to 14 days after farrowing. This study has used only first-litter gilts. There seems to be a relationship between larger huts and lower pig crushing losses. This relationship may be most important for older, larger sows.

Table 1. Cost and size comparisons for pasture farrowing huts; pig crushing losses by hut type (279 total litters born; 11% overall average crushing rate).

	Relative cost*	Floor space (sq. ft.)	# litters born	% live pigs crushed
Quonset[1] (curved steel)	1-1.5	33.8	83	12
A-frame[1] (wood)	1.1	36.0	29	21
A-frame[1] (plastic)	2.0	37.4	30	16
Modified A-frame[1] (plywood)	1.3	42.0	93	8
Pig-saver[2] (plywood)	3.0	42.6	24	7
Pig-saver[2] (plastic)	3.5	32.5	10	9
English style[3] (steel)	2.3	49.5	10	7

*Based on 1995 prices; [1]data from 1990-1995; [2] data from 1991-1995; [3]data for 1995 only.

Bedding

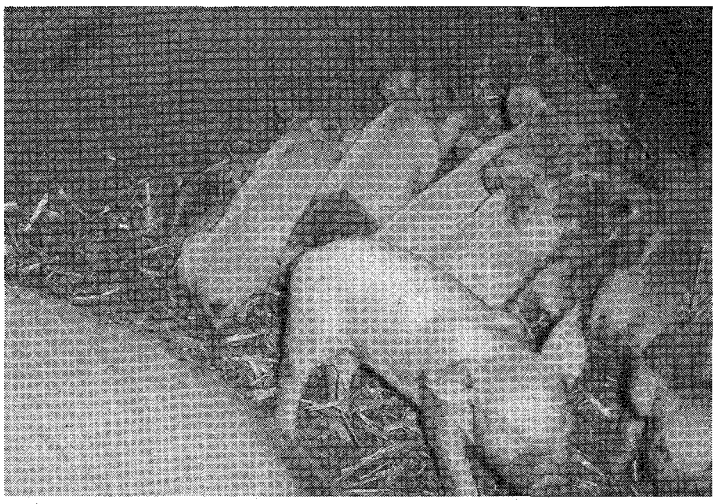
Bedding options include low quality grass hay; whole or ground corn cobs; baled cornstalks; baled, shredded newspaper; and straw. Bedding is very important in wet, cold, or muddy conditions to help the pigs create a dry, draft-free microenvironment.

For large pig shelters, large round bales of hay from grassed waterways are readily available, low in cost, and easy to handle. Although a loader is required for initial placement, the hogs then shred the bales as needed. The bales are dusty and can mold if stored outside, and they may not fit under building roofs. They also require significant floor space. Large, round bales should always be placed on their flat end rather than horizontally because pigs eat around bales. Bales placed on their sides are undercut by pigs; the heavier uneaten top can then collapse all at once from above, possibly burying smaller pigs.

Whole or ground corn cobs are another low-cost option, though their availability may be limited. They are not dusty but they can be difficult to place, and their abrasiveness makes them unsuitable for small pigs. Some Illinois producers fill huts with shredded cornstalks, which the sows use to make a thick, nest-like mat that keeps pigs dry. Additional bedding can be added as needed.

Shredded newspaper is dust-free, costs little, is very absorbent, and makes an excellent bed. It is generally available but can "snow" during transport. Large, square bales of newspapers are also available.

Straw requires hand labor unless large bales are used. It can be unavailable, expensive, and dusty.



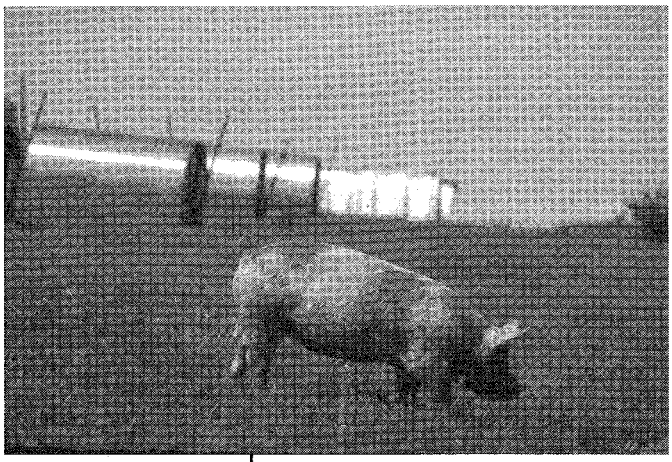
Hut types differ in their pig crushing losses. There seems to be a relationship between larger huts and lower pig crushing losses.

Fencing

Electric fencing is used in pasture farrowing because it is easily installed, removed, and stored. One type consists of individual fiberglass or metal posts with smooth wire. Another comes in rolls of 21-inch netting with fiberglass posts every 12.5 feet. While the former costs less and is easier to use and store, it also requires more training of the pigs, and it will not work for very small pigs. The latter type is quite visible and works for pigs of all sizes, but it costs more. Both styles are powered by a New Zealand-type charger, either a battery or a plug-in model. Fencing can be used to divide pasture into groups of sows having pigs of the same age, an important advantage in successful pasture farrowing.

Marketing

Marketing outdoor-reared pigs is similar to marketing pigs raised indoors. Often, outdoor-reared pigs are born from spring through fall and go to market from fall through spring. Historically, the hog market is lowest in the fall, but seasonal



There is a need to identify lean, rugged genetic lines of pigs suited to the variable conditions of Iowa's climate.

fluctuations in market prices have become less accentuated because there are more confinement facilities that farrow and market pigs year-round. Some producers are joining marketing networks to help assure market access and receive higher bids. Specialty or "niche" markets may also be available for outdoor-reared pigs.

Consumers and packers demand leanness. There is also a trend toward heavier slaughter weights. However, some producers question whether extremely lean pigs are able to thrive in outdoor conditions. There is a need to identify lean *and* rugged genetic lines of pigs suited to the variable conditions of Iowa's climate.

Because pasture farrowing produces large numbers of pigs of the same age, some producers contract their pigs to other farmers for feeding. This strategy helps to alleviate finishing space demands. Many contract feeders prefer outdoor-reared pigs because they are healthy and vigorous.

A subsequent publication in this series will address marketing issues in greater scope and detail.

Labor

Labor needs and total costs are difficult to compare between pasture and confinement systems because baseline values vary widely among individual producers. Some estimates for pasture farrowing labor suggest 10 to 13 hours/litter—higher than the 7 hours/litter average for confinement operations. *But a 1990 survey of three successful Iowa pasture-farrowing producers showed that their labor needs averaged about 3 hours per litter, not including feed preparation and delivery.* Labor demands were seasonal but low on a per litter basis for pasture farrowing herds of more than 180 sows. (Wet weather can raise labor demand because pigs need repeated bedding; in hot weather, they need wallows or wetting.)

Pasture farrowing operations not only have lower fixed costs; they also have potentially lower labor costs, suggesting that well-managed pasture farrowing is competitive with confinement operations.

These producers noted that even though peak labor demand for pasture farrowing occurred during the cropping season, there was not a major conflict. Planting was generally completed before June farrowing began. Although June was a busy month for farrowing, the producers worked with their swine on days unsuitable for field work. In addition, they described their work as "intense" for only three to five weeks; farrowing was then nearly complete until the next year.

The survey showed that producers spent 12 to 15 percent of their time on building repairs, 5 percent on miscellaneous (bedding, breeding), 24 to 30 percent on farrowing management, and 18 to 28 percent in actual feeding. Sorting and moving varied the most among producers (14 to 36 percent), due to differences in physical layout and management style.

Overall, large (greater than 180 litters), well-managed, one-litter pasture farrowing systems in Iowa require about three hours of labor per litter farrowed until weaning (not including feed grinding, mixing, or delivery). Labor costs account for 10 percent and fixed costs account for 30 percent of the difference in profitability between the top profit one-third and the low-profit one-third of Iowa swine producers. Pasture farrowing operations not only have lower fixed costs; they also

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These larger pasture farrowers have developed "systems" for their operations—for example, by arranging all huts in the same pattern in each paddock, with the same number of huts per row. The paddocks are the same size so fencing and water lines can be premeasured to save time. By streamlining production and farrowing more sows at one time, labor requirements can be reduced, and seasonal labor demands for pigs can be adjusted to mesh with those of crop farming.

By streamlining production and farrowing more sows at one time, labor requirements can be reduced and seasonal labor demands for pigs can be matched to crop farming.

Logistics

Bred sows should be moved to pasture one to two weeks before farrowing. Nose rings also should be used in sows to reduce rooting.

Process pigs (castration, teeth clipping) in the hut before seven days of age (3 to 5 days is best). As soon as possible, separate sows that farrow together in the same hut. Large shelters can be used for sows and older pigs so that huts can be used more intensively. Although pigs are usually weaned between 5 and 8 weeks of age, they can be weaned earlier.

Consider an all-terrain vehicle for all-weather access to pigs and huts, and establish wide access alleys or roadways to the pastures to allow easy movement of feed, bedding, people, and pigs. Roadways on high, well-drained land are best in wet weather.

Economics

Feed costs and fixed costs (which depend on the housing system used) are the two main factors determining swine operation profitability in Iowa. One survey found that farrow-to-finish outdoor farrowing producers enrolled in the Iowa Swine Enterprise records program from 1989 to 1993 weaned fewer pigs per litter, weaned fewer pigs per sow per year, and had poorer whole herd feed efficiency than indoor confinement producers. *However, the outdoor operations had lower fixed costs and overall had a lower cost of production* (a lower break-even price). *These lower costs dramatically overshadowed the reduced litter size and poorer feed efficiency.*

In one ISU study, outdoor operations had lower fixed costs and overall had a lower cost of production (a lower break-even price). These lower costs dramatically overshadowed the reduced litter size and poorer feed efficiency.

Fixed costs were $3.33 less per pig weaned for outdoor herds than for indoor. The total production cost to produce a market pig was $1.95/cwt. or $4.88 per 250-pound pig less for the outdoor herds. Production cost reflects feed, labor, repairs, utilities, health, and fixed costs.

Overall, fixed costs were an estimated 30 to 40 percent lower for pasture systems than confinement systems. Total costs were about 5 to 10 percent lower on pasture than confinement. The number of weaned pigs per litter was 5 to 10 percent lower on pasture, but sow mortality was usually lower in outdoor operations.

Producers should strive to keep fixed costs low, improve feed efficiency, and increase the number of pigs weaned per litter. Feed efficiency can be improved by aggressive parasite control, phase feeding, split sex feeding, or feeder adjustment. The number of pigs weaned per litter can be improved through intensive management and stockmanship, tighter control of the breeding season, improved larger huts, and ample bedding. Both litter size and feed efficiency may be improved with genetics. Sows with superior mothering ability would be particularly helpful in outdoor farrowing systems.

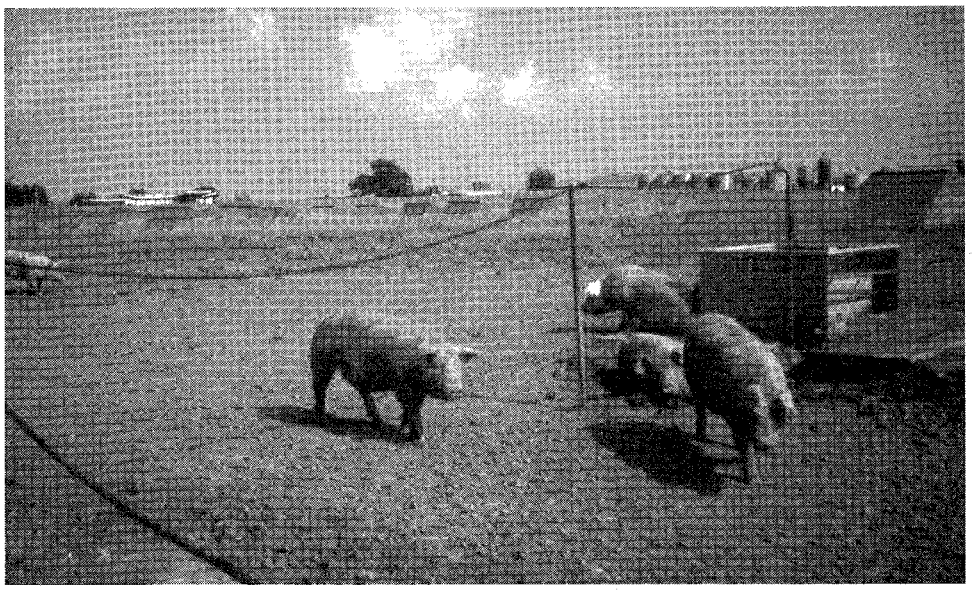
Social Implications

Environment

Properly managed outdoor swine production can be environmentally friendly. Land that is less well-suited for intensive corn/soybean cropping can be converted to a three-year corn/oats/pasture-pig rotation, which provides oat straw for bedding, oats for sows, a legume seeding (usually red clover or alfalfa for farrowing), and corn to utilize nutrients from the swine manure and legumes. Adding a one-year hay crop before the pigs can extend the rotation.

Stocking density and duration, soil type, slope, vegetation type, and climate all interact to determine the amount of vegetation on the pig pasture. This vegetation is important for reducing soil erosion. For example, on sloping land with a thin or young seeding, pigs should stay only for short periods, or pig density must be kept low. This is critical on soils with a high clay content or during wet periods when pigs tend to destroy vegetation. Mud and erosion problems are most easily avoided on sandy, well-drained soils. A slight slope aids drainage, but on steep slopes, pigs can roll out of the huts (or to one side). Buffer strips of grass or forage are helpful in slowing water movement off swine lots and pastures and providing roadways for machinery. In Illinois, farmers are using ryegrass or tall fescue for pasture because it is more resilient to pig traffic.

The portability of outdoor swine production allows producers to make quick changes in response to—or in anticipation of—changes in the markets.



Outdoor pig production on a moderate scale also can be an excellent way to employ family members.

Community

The comparative lack of odor with moderate-sized, outdoor swine operations can have a positive impact on relationships with neighboring swine producers and other neighbors and community members.

Outdoor pig production on a moderate scale also can be an excellent way to employ family members. Children can check and bed huts; older children can help build fence, feed, bed, and water livestock. Family members can work together to move pigs. Frequently, neighbors join forces to set up pig pastures; place huts, shelters, water lines, and feeders; and round up pigs for weaning or castration.

The local economic impact of moderate-sized livestock enterprises is clearly positive. Veterinarians, farm supply stores, feed companies, and livestock truck-

ers all directly benefit; other businesses benefit indirectly. The swine enterprise returns, in terms of both labor and management, accrue directly to the producer, as do the value-added benefit of grain and bedding produced on the farm and the beneficial impact of manure. These profits can then be spent locally. A livestock-based rural economy employs and supports more people than does a grain-farming-based rural economy, both off and on the farm.

Animal husbandry

Various organizations are encouraging more humane approaches to pork production, including systems in which swine can move about and receive no growth-enhancing or disease-preventing medication. Farrowing in pens or on pasture addresses these concerns.

Improving producers' understanding of animal behavior can help producers adapt their systems to their advantage. The pigs' behavior and physiology can be a central part of the system, rather than something to be overridden with equipment, drugs, or other constraints. Pasture farrowing is a viable choice for those who prefer to adapt their systems to the animals' innate behavior.

Improving producers' understanding of animal behavior can allow adaptations in production systems that work to producers' advantage.

Pros and Cons

Pasture farrowing can work well for beginning, part-time, or risk-averse producers, in part because it allows expansion with low investment. Low energy costs relative to hog confinement constitute another advantage.

Seasonal labor demands allow time for planning, vacation, other farm enterprises, or off-farm employment. The variable labor demand also helps avoid producer burnout.

The number of pigs weaned per litter may be slightly less with outdoor farrowing. Weaning performance of outdoor herds also can be more variable year by year, probably because of Iowa's variable climate and seasonal constraints. In a typical outdoor system, if the producer farrows in less than six-month intervals, the sows will soon be farrowing in extreme hot or cold seasons.

Disadvantages include adverse weather conditions (mud, cold, heat, rain), predators (coyotes), and the fact that all-gilt systems need new boars every year. But these must be weighed against numerous advantages: no manure handling or odor problems, flexibility to expand or downsize, low capital overhead requirements, low production costs, healthier pigs, and outdoor working conditions.

Pasture farrowing can work well for beginning, part-time, or risk-averse producers, in part because it allows expansion with low investment.

Getting Started . . .

- Develop a management style to fit specific characteristics of your operation.
- Minimize investment in overhead, start small, and grow slowly to reduce risk.
- Use portable buildings and equipment, so production can be easily changed to adjust to changing markets, feed prices, or labor supply.
- Rotate crops to maximize benefits to both the crops and the pigs.
- In cold months, select the best sows to farrow inside; on all-gilt systems, market first-litter sows as breeding stock; raise your own replacement boars using artificial insemination.
- Handle large groups of pigs from pasture farrowing by pasture feeding, selling feeder pigs, or contract feeding.
- Use 7 to 15 huts per acre, considering soil type, rainfall, slope, and vegetation.

Other Information

The following list of manufacturers is supplied for reference; it does not constitute endorsement for particular products.

SOURCE	PRODUCT
Premier Supplies, Ltd., Box 89, Washington, Iowa 52353	electric netting, stranded wire, fiber posts, energizers
Bohlmann, Box 369, E. Hwy. 30, Denison, Iowa 51442	sow feeders and waterers
Pride-of-the-Farm, Hawkeye Steel Products, Box 2000, Houghton, Iowa 52631	feeders, waterers, huts, shelters
Port-A-Hut, Storm Lake, Iowa 50588	shelters, huts

Other hut sources: Osco Lumber, Osco, Illinois; EZ Hutch, Kettersville, Ohio; Seivers Pig Saver, Meppin, Illinois; Hosch's Hog Huts, Cascade, Iowa; Hampel Corp., Germantown, Wisconsin.

Additional reading

**Alfalfa grazing by gestating swine: a four-year summary.* M.S. Honeyman and W. Roush. 1995. ASL-R1260. Swine Research Report. AS-627. ISU Extension Service. Ames, Iowa.

Outdoor pig production. K. Thorton. 1988. Farming Press, Ipswich, U.K.

**Outdoor vs. indoor pig production in Iowa: an economic and production comparison.* Honeyman, M.S. and A. Penner. 1995. Swine Research Report. AS-627, ISU Extension Service. Ames, Iowa.

**Pasture farrowing labor use study.* M.S. Honeyman and M. Duffy. 1991. ASL-R868. Swine Research Report. AS-619. ISU Extension Service. Ames, Iowa.

Pasture farrowing systems. Port-A-Hut, 14 Peterson Drive, Storm Lake, Iowa 50588 (1-800-882-4884).

Pork industry handbook. 1994. Iowa State University Extension Service, Ames, Iowa.

**Rape grazing with gestating gilts* and *Segregated early weaning of pasture farrowed pigs.* M. S. Honeyman, A. Penner, and W. Roush. 1996. ISU Western Research Farm 1995 Progress Report.

**Sustainable swine production in the U.S. corn belt.* 1995. M.S. Honeyman. Journal of Alternative Agriculture, 6 (2):63-70.

**Whole hog management.* M. S. Honeyman. Sept./Oct. 1990. The New Farm.

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File: Animal Science II [B] 11/98

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SA-9 | Revised | May 1996