Swine Confinement Breeding Units
Michigan State University
Cooperative Extension Service

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December 1982
6 pages

Fact Sheet No. 19.45.15
Extension Bulletin E-1395, December 1982

# pork industry handbook

COOPERATIVE EXTENSION SERVICE • MICHIGAN STATE UNIVERSITY

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Reproductive performance is the weakest link in most swine operations. As confinement intensifies, reproductive performance tends to become more of a problem. While confinement technology is well advanced in the farrowing, nursery and finishing phases, it is not so in the breeding phase. The ideal confinement breeding system has not yet been designed or described; much has been learned, however, through research and producer trial and error.

The three major reasons for considering a confinement breeding unit are: (1) It provides alternative uses for land required for sow lots; (2) It maintains reproductive efficiency during stressful environmental conditions; and (3) Many producers desire to adapt a weekly farrowing schedule with the "all-in, all-out" building use concept.

This fact sheet will consider these reasons by examining management strategies, physiological considerations, and sample physical arrangements in the confinement breeding unit.

### General Considerations

In general, a confinement breeding system is accompanied by a hand-mating program. When a pen-mating system is chosen to reduce labor costs, however, modified confinement building systems may be more desirable. For example, many producers have taken advantage of existing facilities, such as a vacant cattle-feeding lot, where considerable concrete space and shelter is available, by converting the facilities to confinement breeding units. Also, many automated cattle-feeding systems may be converted for sow feeding. In most instances, this type of system is low cost. It also reduces land needs and eliminates mud problems. When manure builds up or if ice is present, however, slick footing becomes a problem during mating.

Another example of a less intense confinement system would be the use of a low profile, open-fronted building. Yet this system has disadvantages similar to the previous system. Boars should be rotated from one breeding pen to another every 12-24 hrs.

A totally confined, environmentally controlled breeding unit eliminates most of the problems associated with the weather; however, it generally requires hand-mating. Hand-mating is not a disadvantage because it enables the producer to plan a more precise farrowing schedule as compared to pen breeding.

### Management Strategies for Confinement Breeding

Each producer must deal with different management circumstances when considering a confinement breeding facility. One important consideration for all producers is return on investment. With present building costs, a total investment of $1500-$2500 per sow in breeding through finishing facilities is not uncommon. When farrowing crate or finishing space is empty because of a reproductive failure, the cost of the failure must be covered by the production from those stalls, crates or spaces which are occupied. Therefore, buildings must be occupied at 100% capacity for maximum return on the investment. Thus, a producer must plan a breeding herd program and provide the facilities and management that will consistently achieve a conception rate and litter size that insure an animal for every available space. This concept is especially important during periods of smaller profit margins.

Hand-mating is another important management consideration. For the purposes of this publication, hand-mating will be considered an integral part of confinement breeding. Most sows return to heat 4-7 days following weaning. First-litter sows generally take about 48 hrs. longer than older sows in returning to heat. Thus, if weaning occurs on Thursday or Friday, a producer can expect to breed the sows the following Monday through Thursday.

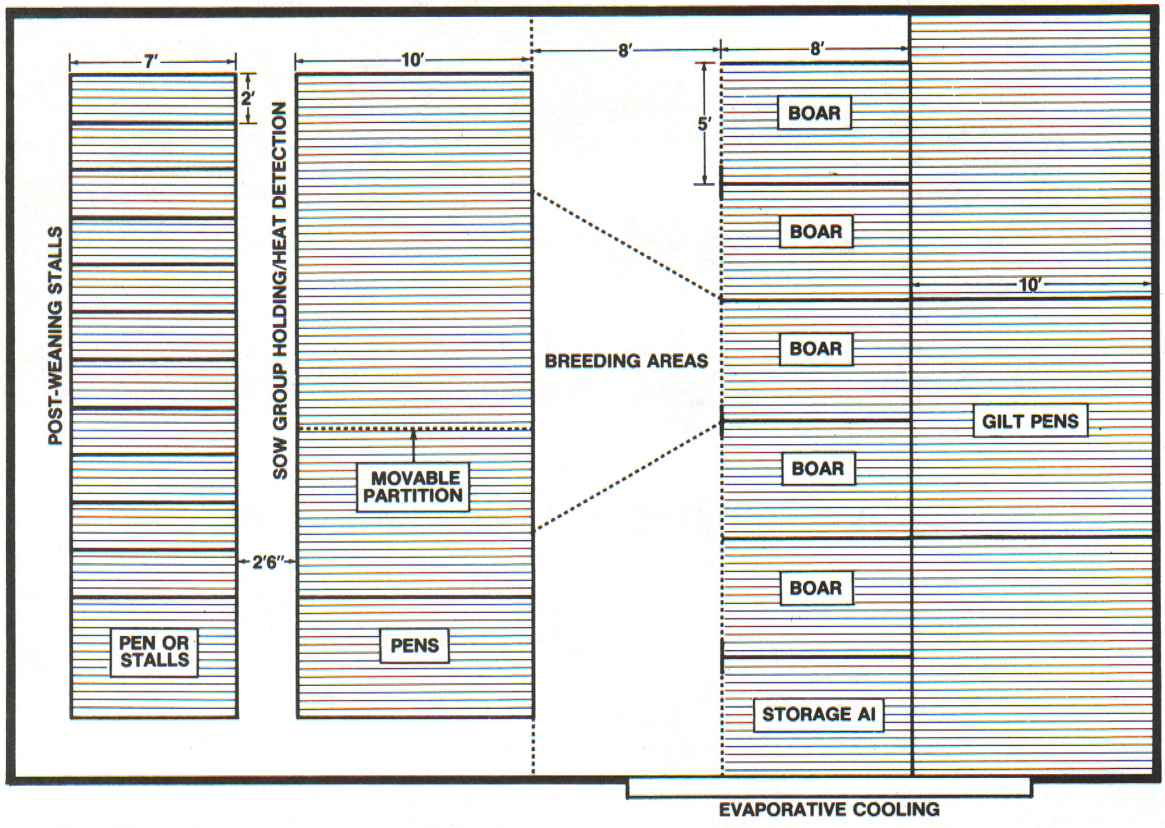


**Figure 1. Totally enclosed building with individual post-weaning crates and heat detection pen.**

Since a perfect synchrony is seldom achieved, the producer needs to check for heat and make some matings daily, including weekends. Since getting sows bred is essential to the entire operation, skilled labor must be available seven days per week. Some feel that labor should be paid an incentive bonus when conception rates consistently exceed a given level during each breeding period.

Records of breeding herd performance verify the results of management and are valuable tools for decision making. Good management insures that all spaces in the gestation area are filled on schedule with pregnant females. Also, records help identify breeding problems with boars and females at an earlier date. Record systems range from commerically available computers, record wheels and cards to various record card systems developed by individual producers.

Many production units are adapting the "all-in, all-out" concept for farrowing and nursery facilities. To accomplish this system, the number of matings must be controlled to insure that the proper number of females farrow each period. A weekly schedule appears to be an integral part of most confinement breeding systems when design and capacity are considered. For example, if 60 litters per month are desired, it is much more efficient to plan a breeding schedule for 15 sows per week for each of 4 weeks rather than breed 60 females in one week and then have the unit idle for the next 3 weeks. A weekly breeding schedule will also improve the use of boar power.

The effects of high temperatures on fertility, particularly in the boar, have been well documented. Additionally, weather problems associated with ice, snow and mud may reduce conception rates. A properly designed confinement unit eliminates most weather related effects, which, in turn, helps maintain a constant flow of animals.

Since hand-mating is used, boar power can be controlled to insure that boars are not overworked, that each sow is mated, and that each sow is mated twice at 12-24 hour intervals to different boars. This last requirement is known to increase conception rate and litter size.

The main reason, then, for considering a confinement breeding unit is to maximize production efficiency with a given set of facilities. Considerable managerial skill is required, however, so the decision should be carefully studied before adopting such a system.

## Physiological Considerations

Regardless of the specific design of the facility, several factors are known to affect reproduction and should be considered.

### Temperature

High temperatures (above 80-85 F.) cause lowered semen quality in boars, reducing conception rates and litter size, and may increase embryonic death loss in females. Heat stress can cause anestrus in females and decrease libido in boars. Therefore, some method of cooling should be provided during the hot months of the year. Cooling can be accomplished with sprinklers, ventilation fans, evaporative coolers or with mechanical air conditioning units. Less is known about the influence of low temperatures, but confinement breeding units should be maintained at a minimum of 40-45 F. to reduce maintenance requirements of the animals and to eliminate water freezing problems.

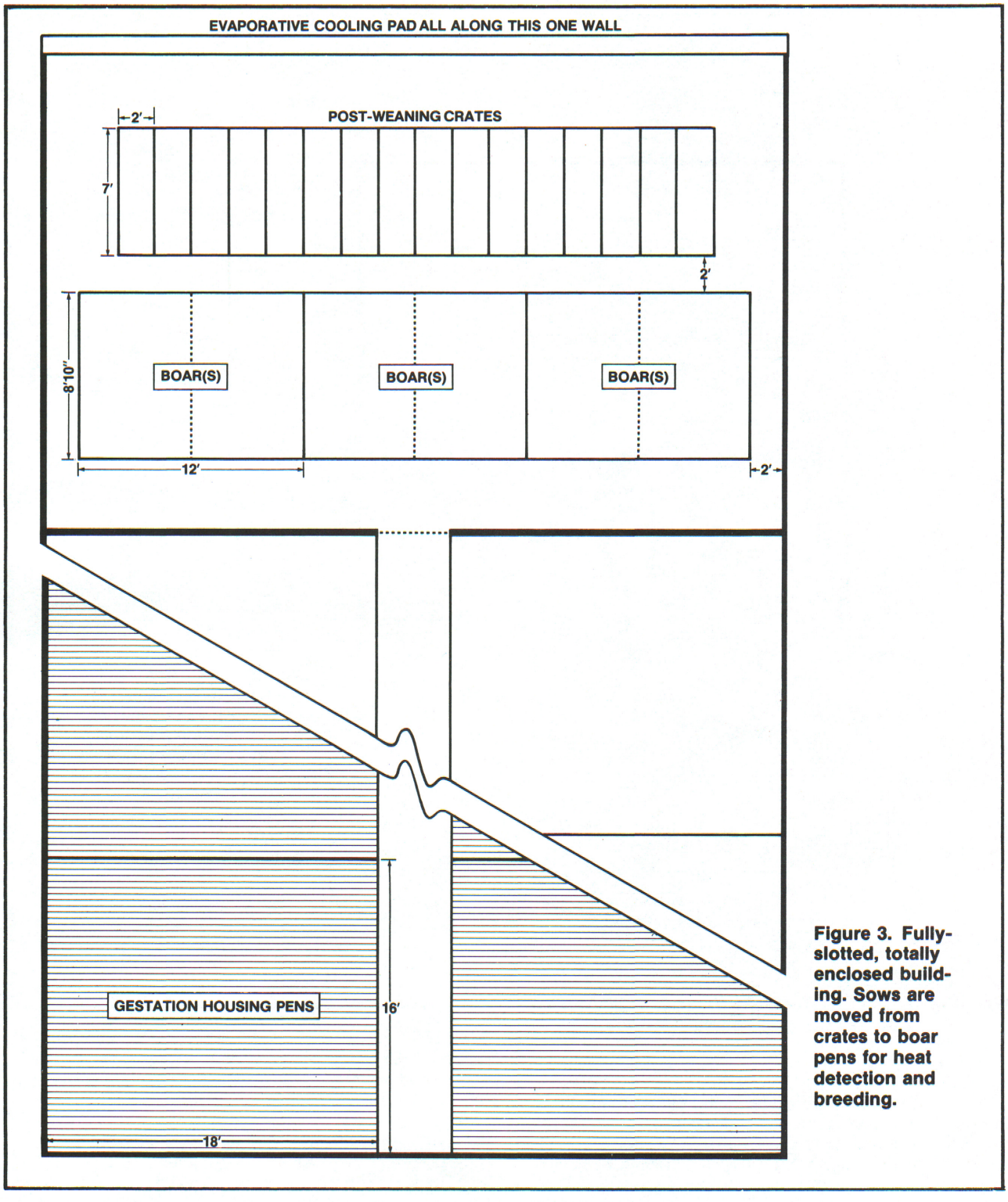


**Figure 3. Fully-slotted, totally enclosed building. Sows are moved from crates to boar pens for heat detection and breeding.**

with a slight crown in the center. The floor surface should prevent slipping during mating but should not be so rough as to cause footpad abrasion. A variation is the use of a roughened wide slat with a narrow (⅜ in.) slot or a special breeding gang slat.

A series of gates in the breeding area allows several sows to be mated at once. Individual pens are provided for boars. Individual housing of boars generally increases longevity and reduces unsoundness problems since each boar can be fed to maintain proper condition, and fighting and dominance are eliminated. To provide adequate back-up boar power, about one boar should be maintained for each 1.2-1.5 sows bred weekly. As shown in Figure 1 a boar pen could be converted to a storage or semen collection area for artificial insemination, if desired. If gilts are to be bred in the same unit, their pens should be located adjacent to boars, and adequate space (about 20 ft.$^2$) should be provided. A slotted floor with a manure storage pit or a flush system is generally used. Animals can either be hand or mechanically fed.

**System 2**

(Figure 2) This arrangement is also designed for use in an intensive breeding and farrowing system. The breeding

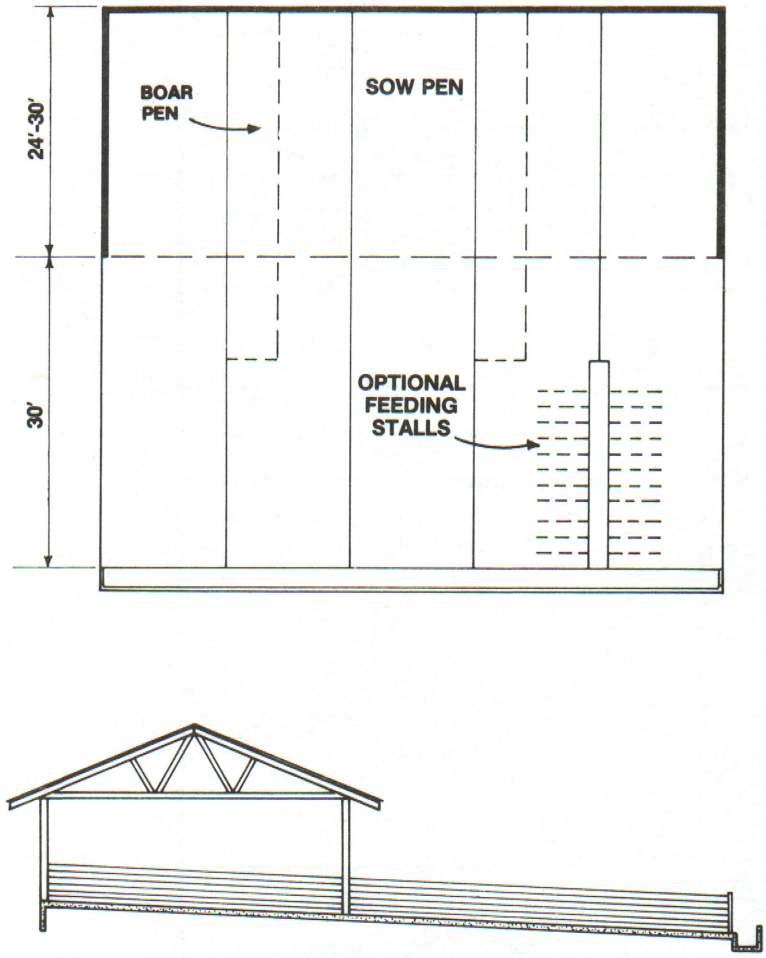


**Figure 4.**
**An open-front shed with outside run. (TOP) Plan view. Boar pens can be located between sow pens for hand mating. Feeding can be done on the floor or in feeding stalls between the sow pens.**

area is generally located at one end of the confinement sow gestation house. Sows are weaned on Thursday or Friday and moved to the individual post-weaning crates. The crates also serve as individual feeding stalls. The boar(s) is housed in the pen directly behind sets of 3 or 4 crates, which allows the boar(s) to aid in heat detection. Sows are turned out of the crate into the boar pen for mating to take place. Following mating, sows are put back into the crates.

The floor of this breeding facility is usually totally-slotted. A variation is the use of total slats for the post-weaning crates and a partially slotted floor for the boar pen.

**System 3**

(Figure 3) This arrangement is designed to provide maximum comfort for estrous females and working boars. It is also designed for an intensive breeding and farrowing schedule.

Post-weaning crates are aligned across one end of the breeding facility, approximately 3-4 ft. from the wall, which allows room for the feeding and handling of animals. This wall contains an evaporative cooling pad across its entire length. Sows are weaned from the farrowing house or sow-litter nursery and are then placed in the post-weaning crates, facing the wall. Sows are removed from the crate and placed in the boar pens for mating.

The floor of this breeding facility is totally slotted. Gates are placed at both ends of the post-weaning crates so sows can easily be moved in and out. Animals may either be hand or mechanically fed.

After all sows have been mated, they are penned individually in gestation crates or grouped together in a gestation pen, and a "clean-up" boar for heat-checking is placed with them.

**System 4**

(Figure 4) The open-fronted, low profile shed with outside run system is offered by some commerical companies, but it can be adapted from an existing building. Bedding is used inside during winter, while the outside runs

### Gilt development

Difficulties are often encountered in developing and breeding gilts in confinement. Although a perfect system has not been designed, it appears that three factors—boar exposure, space (ft. $^2$) and movement—may enhance cycling activity of gilts. It is recommended that the gilt pen(s) be located adjacent to boars and that each gilt be allowed about 20 sq. ft. Also, occasional movement of gilts from one pen to another may improve the percentage of gilts coming into heat.

Introduction of the desired number of gilts into the breeding herd before each breeding period is a difficult problem. One method is to maintain a gilt pool large enough to guarantee the desired number of bred gilts for each week. By adding gilts and selling those in the pool that have not cycled after 25-30 days, a producer can maintain a constant number without allowing noncyclic gilts to remain for long periods of time. There is little sacrifice in market price for such gilts if they are sold in the 250-275 lb. weight range.

Some production units have incorporated an open-front building in their breeding arrangement for gilt development, feeling that the environmental changes help stimulate gilts to cycle.

### Physical Arrangements and Management

There are several breeding building arrangements in use. Producers should consider their environmental conditions, production schedule, management ability and personal preference when selecting a building and floor plan. Consult with your Extension personnel and PIH-28, "Confinement Sow Gestation and Boar Housing," for breeding building arrangements in addition to those shown as follows.

### System 1

(Figure 1) This arrangement is designed for use in an intensive breeding and farrowing system. There are five components which could be arranged differently, depending upon the capacity and building width. Sows are generally weaned on Thursday or Friday and moved to the individual post-weaning crates or stalls. Some producers provide water, withholding feed for one or two days post-weaning while others provide limited feed during this period. On Monday, when heat detection and breeding commence, the sows are moved to the heat detection pen. As sows are mated, they are penned behind a movable partition. The breeding area is usually broom-finish concrete

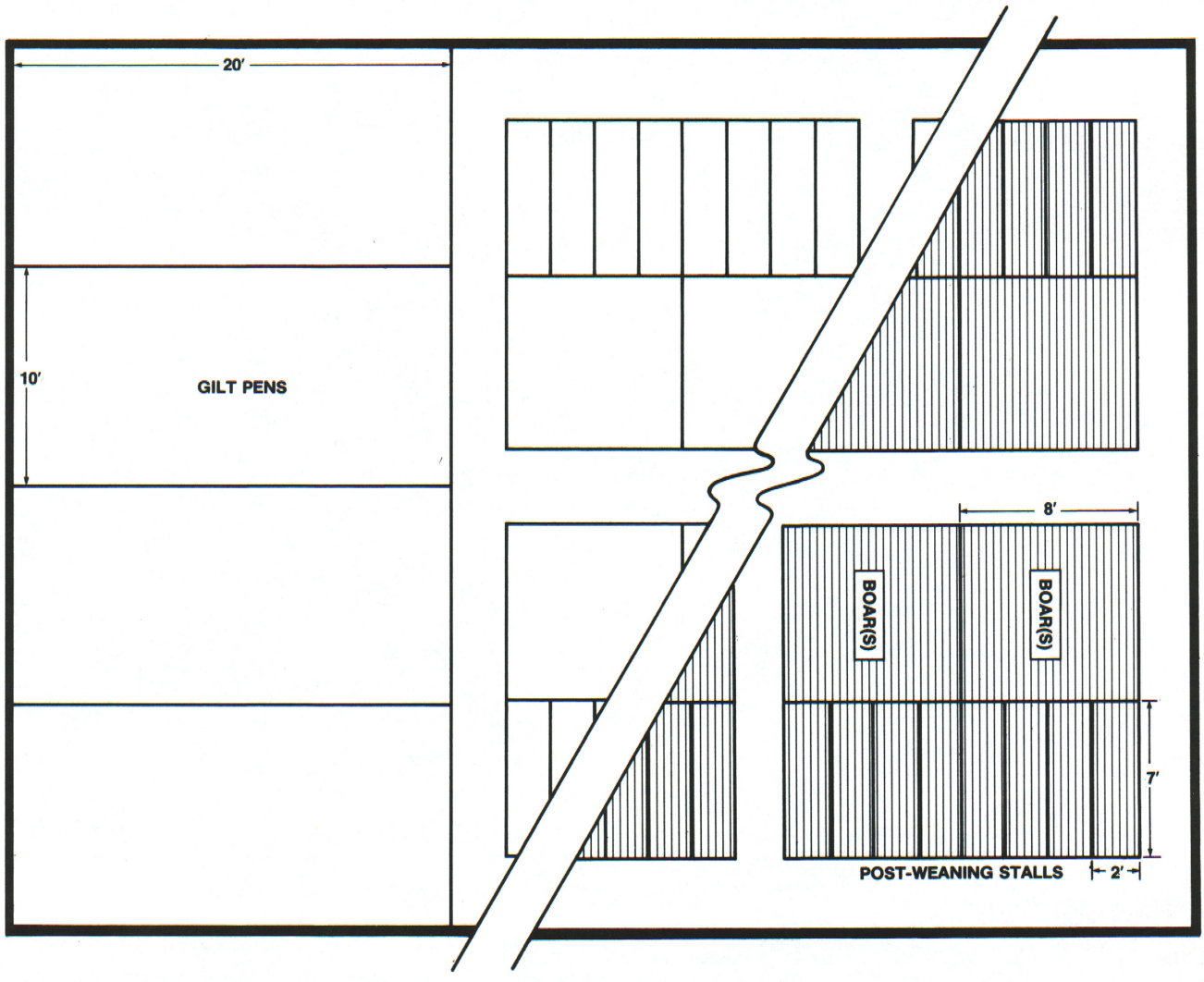


**Figure 2. Depending upon environmental conditions, this building could be either totally enclosed or curtain sided. Heat detection is accomplished by moving sows back into the boar pen.**

are scraped frequently. About 15-20 sq. ft. of housing area is allowed per sow, plus an equal or greater amount of paved area outside. If pen-mating is used, the boars are usually rotated daily. If hand-breeding is desired, Figure 4 shows a suitable arrangement. The sows can be hand-fed daily on the floor, individually-fed in stalls or interval-fed at self-feeders.

## Summary

The perfect confinement breeding unit has yet to be designed. The four layouts and their modifications presented in this fact sheet appear to be workable. Obviously, each management unit will have somewhat different requirements for a breeding unit.

Following are some points to keep in mind when considering a confinement breeding unit:

1. Total confinement generally dictates hand-mating.
2. Building and labor costs seem to favor a weekly schedule.
3. Consider the physiological needs of the animal in the building arrangement. (Boar exposure, temperature, flooring, stress reduction, etc.)
4. Plan arrangement for ease of animal movement and efficient use of labor.
5. Allow ample number of boar pens.
6. Design and use a good record keeping system.
7. Keep breeding area surface dry.



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Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8, and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Gordon E. Guyer, Director, Cooperative Extension Service, Michigan State University, E. Lansing, MI 48824.



*2P-2M-12:82-KMF-DP, Price 20 cents. Single copy free to Michigan residents.*