

MU Guide

Biosecurity for Today's Swine Operation

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Disease control is one of the most challenging areas for producers and veterinarians in swine production. Biosecurity is often perceived as keeping diseases out of a swine herd. However, excluding disease from a herd is nearly impossible because of the natural presence of pathogens — the endemic pathogen load — in all swine herds. Therefore, the goal of a biosecurity program is to keep out pathogens that the herd has not been exposed to and to minimize the impact of endemic pathogens. With a good biosecurity program, optimal growth can be reached by minimizing the negative effects of subclinical illnesses. High reproductive performance can be achieved with a decrease of costly factors such as embryonic loss or preweaning mortality due to disease. This publication introduces key elements of an effective biosecurity program. A final plan can be developed in cooperation with your herd veterinarian to best accommodate constraints for a given operation.

Location

The herd should be located as far as possible from other swine, with a goal of 1.5 miles between operations. Attention should be given to wind direction and the location of other pigs or wildlife because pathogens can be spread through the air. Flat land without trees or other protection from the wind provides a greater risk for the spread of disease. In Missouri, wind direction generally is from the southwest during the summer and fall and from the northwest during winter and spring.

If there are other animals or livestock on the farm, the swine facilities should be located at least 100 yards away from the other animals. Other hog buildings on the same farm should be separated from each other by about 50 yards. In addition, buildings should be located at least 100 yards from any public road, especially if there is swine traffic on that road, to minimize exposure from animals in transit.

Facilities and flow

A chain-link fence should surround the perimeter of the operation to exclude unwanted animals and people.



To keep these pigs performing up to their genetic potential, their exposure to pathogens must be minimized. Minimum pathogen exposure is the objective of a complete biosecurity program.

The entrance should be gated and locked and have warning signs that the farm has a biosecurity policy.

People

The office and main entrance should be located near the fence/perimeter. The office should have a kitchen on the premises so that employees can have meals directly on the farm and need not leave the facilities during the workday. Employees should not live at another pig farm or have contact with pigs outside of the farm at which they work. Visitors should be kept to a minimum, and should have no pig contact for at least twenty-four hours before arriving on the unit.

A sign-in book for visitors should be maintained. The sign-in book should include when and where the visitor was last around pigs as well as their printed name and signature. The purpose of the sign-in book is to keep a running record of anyone who has been in contact with the herd so that if a disease should break out, it may be possible to determine where the pathogens came from. A buzzer or other device, such as a hand-held radio, should be available at the office entrance so that visitors can contact employees in the barn if no one is available in the office area. Doors should be locked, especially when employees are not on

the premises. Animals of any kind should never pass through the employee entrance.

All employees and visitors should shower in before entering the facilities. The shower should be located such that no entry into the building is possible without first taking a shower. The shower should divide the locker room in half such that the clothes and jewelry worn to the farm are left on one side (“dirty” side), a shower is taken, and then employees and visitors pass through the shower to the “clean” side, where the farm clothes are provided. When leaving, employees and visitors can shower out.

A washer and dryer should be kept in the office so that farm clothes can be cleaned on the premises. Clean clothes and boots should be provided on the “clean” side and should not leave the farm.

Daily chores should be completed in the order of highest health status to lowest health status. For example, nursery pigs have a higher health and biosecurity status than the breeding herd. The oldest sows have the greatest pathogen load. Therefore, nursery pigs should be taken care of before attending to the breeding herd, especially if there is only one person in charge of all ages of pigs. This procedure is necessary to prevent spreading the pathogen load from the breeding herd to the younger pigs.

An employee who does not come into contact with the main herd should take care of the pigs in isolation or acclimation. Alternatively, a person in contact with the main herd could complete isolation and acclimation chores at the end of the workday and maintain biosecurity from the main herd by wearing separate boots and clothes.

Pig flow

Pigs should be moved as a group during each production stage in an *all-in/all-out* manner. All-in/all-out flow is the concept of moving pigs of the same age at the same time. For example, a group of pigs is weaned from a farrowing room at the same time and moved to the nursery. After a set period of time, this same group of pigs is moved from the nursery to the grower and finisher. No pigs are added to the group or placed in a younger group and the facilities can be cleaned and disinfected before a new group enters. The use of all-in/all-out flow allows the pigs to be exposed to the same pathogens as their pen mates. The transition from continuous flow to all-in/all-out flow will improve feed efficiency and shorten days to market (see MU publication G2507, *Herd Management for Disease Prevention*).

When a group is moved from any facility, the area needs to be fully cleaned (including removal of feed), power washed, and properly disinfected. There should be an adequate period of time, a minimum of 6–8 hours, for the cleaned and disinfected area to dry before new animals are moved into the facility.

Newborn, weaned, feeder, and breeding pigs need

Elements of a biosecurity plan

Traditional disease-prevention techniques, including immunization and controlled biofeedback practices, are only a small part of an overall biosecurity plan. Today’s plans are intended to reduce the use of antibiotics on farms. Generally, biosecurity measures to ensure pathogen segregation should include the following practices:

- Clean all rooms thoroughly with a high-pressure washer and disinfect with a broad-spectrum product.
- Construct all rooms to avoid physical contact or shared air among pigs of different ages. Avoid common pits.
- In facilities with multiple rooms and pigs of different ages, sequence the care of pigs so that those with the highest health status (usually younger pigs) are cared for first.
- Workers must always wear clean clothing and boots to the site. Advise workers not to return to higher health status rooms after being in contact with a lower health status room without proper cleaning and sanitation of clothing and boots.
- Buildings should be rodent-proof. If rodents are present, a professional exterminator should eliminate them.
- Vehicles should not enter the premises unless they are cleaned and disinfected.
- Place dead animals outside the premises for removal by rendering trucks.
- Locate load-out facilities at the perimeter of the premises.
- Minimize the number of visitors, and require them to wear clean clothing and boots.
- Install a perimeter fence around the premises to keep out unwanted visits from people, pets and feral animals.

Source: Clark, L.K. SEW [segregated early weaning] - control or elimination of *Mycoplasma hyopneumonia* and viruses. Proceedings of Swine Disease Conference for Swine Practitioners, Ames, Iowa. November 1995; pp. 69–73.

to be housed separately because of the different health and biosecurity levels for each age group and stage of production of the pigs. Some diseases may cause few or no clinical signs in one age group but may be highly pathogenic to another group. In the farrowing house, limit cross-fostering to within the first twenty-four hours after birth. It is important not to back-foster and to properly euthanize any sick piglets. Reduce the age spread in a group or room of pigs as much as possible; less than a 14-day age spread is preferred. Because of differences in immune status and pathogen exposure, do not mix pigs from different farms. Any mortalities or euthanized pigs should be removed promptly.

Facilities. All buildings, especially naturally ventilated buildings, should have screens to keep out insects, birds and other domestic and wild animals. Buildings should be kept clean so that rats, mice and other rodents do not have access to feed or water. Cleaning removes

organic matter that can prevent most disinfectants from working. Power washing, particularly with hot water, is a good way to keep facilities clean, and disinfecting further reduces the chance of pathogen survival in the buildings (see MU publication G2507, *Herd Management for Disease Prevention*, for more information on disinfectants). In addition, materials and equipment should be durable and easy to wash. Any necessary tools or materials brought in to fix the facilities should be new. If used equipment is required, it needs to be disinfected before entering the facility. It is particularly important to educate off-farm maintenance personnel on the importance of biosecurity.

As another method of biosecurity, footbaths can be placed at the entrance of every individual room or building, especially if the production unit is not a confinement unit. In the farrowing house, when employees move from a room with younger pigs to a room with older pigs or vice versa, a footbath can be placed at the door of each room. The disinfecting solution should be changed regularly, and personnel should be aware that footbaths are effective only when the boots are free of organic matter (such as manure).

Not only should the inside of the buildings be kept clean, but the area around the outside of the buildings should also be maintained. Cleaning fan openings and trimming weeds will help to control rodents around and in the buildings.

Load-out facilities

Load-out facilities should be located on the perimeter or outside of the fence so that outside, nonfarm vehicles do not enter the farm. If load-out facilities are located outside the farm, a location of a mile or greater from the production unit is preferable. If possible, only farm vehicles should travel the road that connects the production unit to the load-out facility. If the loading truck, a nonfarm vehicle, travels to more than one farm, it needs to be washed and disinfected. The truck driver should wear clean clothes and boots each time, and especially to each individual farm. The truck driver should not enter the building and should load the pigs without any assistance from farm personnel. Farm personnel should not exit the building, nor should animals be able to re-enter the building. The loading facility should be washed and disinfected, ideally after each use, and should not drain into the building. If cleaning of the load-out facilities is done by farm personnel, cleaning should be done at the end of the day so that personnel do not need to re-enter the building that day.

Sick pigs

Isolate sick pigs, for example by creating a sick pen, so that they are not in continuous contact with the rest of the herd. If there is a disease problem in the herd, a postmortem examination may be beneficial in providing health information (contact your local veterinarian or

the State Veterinary Medical Diagnostic Laboratory for more information at (573) 882-6811). Examinations conducted by your veterinarian at the packing plant at the time of slaughter are another way to provide health status information.

Mortality

State regulations should be followed for all methods of animal disposal (see MU publication WQ216, *Dead Animal Disposal Laws for Missouri*). All dead stock should be taken care of daily, because they may act as disease reservoirs. To use a rendering service, farm personnel should deliver dead pigs to an off-site point where the renderer can pick them up. Alternatively, dead animals can be disposed of directly on the farm through incineration or composting (see MU publication WQ351, *Composting Dead Swine*). Be sure rodents and other animals do not have access to the dead pigs.

Feed

Feed bins should be installed so that feed trucks do not need to enter the farm unit. Feed delivery should take place first thing in the morning when the feed truck is clean, as it should have been washed the night before.

Waste management

An on-farm employee should remove manure from the facilities. Removing slurry with farm vehicles reduces the risk of contamination from other farms. If this is not feasible, an outside source can be used, but the equipment must be clean.

Introducing new animals into the herd

All new breeding animals should come from a single source using a genetic pyramid production system. In a pyramid system, the purebred animals at the top of the pyramid (nucleus herd) are the highest level of biosecurity and health status. Commercial production animals are at the bottom of the pyramid with multiplier animals in between. Animals should arrive at your herd from a higher level in the pyramid. When using artificial insemination and purchasing semen from an outside source, there is still a risk of disease transmission through the semen, especially reproductive viruses. While this risk is not as high as bringing in new animals, it is important to purchase semen from a boar stud that has a biosecurity program of its own in place. The biosecurity for a boar stud is much the same as the biosecurity program of a production unit, including the isolation and acclimation of new boars.

Isolation facilities should be located at least 500 yards from the main herd. Although there may be reasons for longer periods, a minimum of 30 days isolation and 30 days acclimation are necessary for good biosecurity. During isolation, the new animals should be

blood tested and observed for any signs of disease. If animals come from out of state, they are required to be tested for pseudorabies (PRV) and brucellosis. Additional diseases often tested for include *Mycoplasma hyopneumonia*, porcine respiratory and reproductive syndrome (PRRS), transmissible gastroenteritis (TGE), swine influenza (SIV), leptospirosis, and *Actinobacillus pleuropneumoniae* (APP). The specific tests for a given operation should be determined with the herd veterinarian. Be sure to evaluate test results with your veterinarian before moving any animals from isolation.

Acclimation may be done in the same facility as isolation, although only one group of animals at a time. During acclimation, the new animals need to be exposed to the pathogens present in the main herd through the use of manure (biofeedback) or placing cull animals or failure-to-thrive nursery pigs from the main herd in the same pen with new animals. You should be aware of the current disease profile of the main herd. Check with the supplier, or have your herd veterinarian check with the

supply herd's veterinarian, to be sure that the supply herd has not broken with any diseases since you received animals. The vaccination schedule for replacement animals can be arranged with your herd veterinarian.

The biosecurity measures described in this publication can be adapted to individual swine operations. A biosecurity program is not meant to rid a herd of pathogens, as there are certain levels of pathogens present in every herd. Rather, it is meant to reduce the risk of introduction of new pathogens into the herd and to minimize the impact of endemic pathogens. Overall, good management is the key to a successful biosecurity program and swine operation.

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