

Biosecurity in Small-scale U.S. Livestock Operations

Animal health is closely related to profitability, since healthy animals are more productive and introduction of disease to a naïve herd or flock can have negative economic consequences.

Biosecurity is a system of practices designed to reduce the risk of introducing disease to an operation and prevent disease spread among animals. Because disease transmission to even one animal can affect the health of animals on the entire operation, biosecurity practices are an important part of the health management plan of all operations. Ideally, operations should work with a veterinarian to develop practical and cost effective biosecurity practices. Good biosecurity practices include

- proper handling of new animals and visitors,
- regular veterinary consultations,
- limiting contact with outside animals,
- use of animal identification, and
- knowledge of interspecies disease transmission.

The U.S. Department of Agriculture's National Animal Health Monitoring System conducted the Small-scale U.S. Livestock Operations, 2011 study. The study focused on operations that raised livestock and had gross annual sales from \$10,000 to \$499,999. Based on the NASS 2007 Census of Agriculture, approximately 350,000 farms in the United States fit this definition of a small-scale livestock operation. Livestock included cattle, poultry, goats, sheep, swine, horses, aquaculture, and other farm animals raised for sale or home use. For the study, 8,123 small-scale operations from all 50 States¹ responded to the survey.

¹**States/Regions:** Regions were based on Sustainable Agriculture Research and Education regions:

North Central: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin

Northeast: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia

South: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia

West: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.

Multiple livestock species

The presence of multiple livestock species on an operation can have implications for disease transmission. For instance, several domestic and foreign animal diseases can infect multiple ruminant species, and some influenza virus strains might be transmitted between swine and avian species. In addition, some species can be carriers of a disease without showing clinical signs of disease, yet can still transmit the disease to other species.

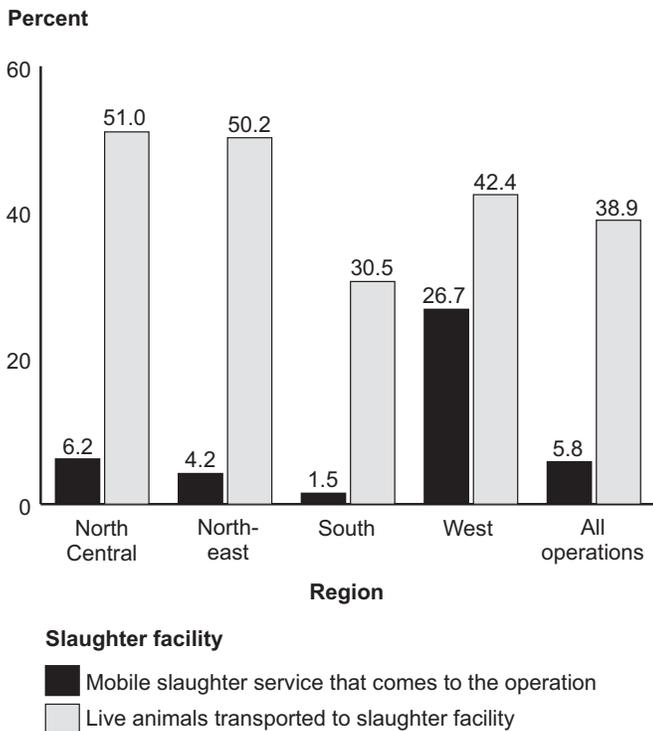
The majority of small-scale operations (87.2 percent) raised beef cattle during the 12 months prior to the study survey, and about half of operations (47.1 percent) had more than one type of livestock during the same time period. The West region had a higher percentage of operations with more than one type of livestock species compared with operations in the other regions. Operations in the West region commonly kept both beef cattle and horses.

Slaughter facilities

Some regions of the United States do not have enough slaughter facilities to meet the needs of local small-scale farmers (Goodsell, 2010). A mobile slaughter unit is a self-contained slaughter facility that travels from site to site and is an alternative to using a stationary slaughter facility. Mobile slaughter units, however, can increase the risk of disease transmission between farms or animals. For example, disease spread can occur if the unit's equipment is not properly decontaminated between operations. Using mobile slaughter units can also decrease the risk of disease spread because animals processed in these facilities do not go to market and are, therefore, not exposing other animals before being slaughtered.

Overall, 5.8 percent of operations used a mobile slaughter service for livestock or poultry and 38.9 percent had live animals transported to a slaughter facility. A higher percentage of operations in the West region used a mobile slaughter service (26.7 percent) compared with operations in the North Central, Northeast, and South regions (6.2, 4.2, and 1.5 percent of operations, respectively) [figure 1]. Operations that did not use a mobile slaughter service or transport animals to slaughter might have sold animals through an auction instead.

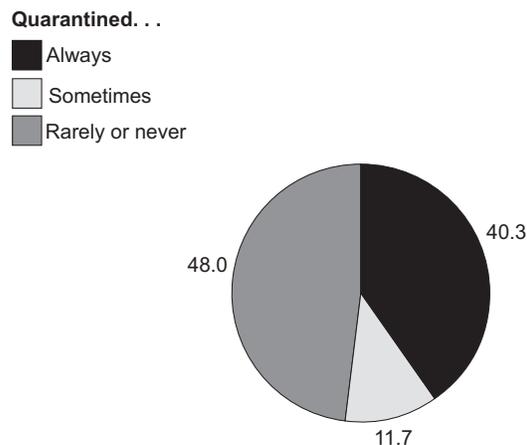
Figure 1. Percentage of operations by facilities used for slaughtering livestock or poultry for home use or sale, and by region



poultry onto the operation increased as farm sales² increased, ranging from 37.4 percent of low-sales operations to 68.3 percent of high-sales operations. High-sales operations were also more likely to have had livestock or poultry move off the operation and return (22.3 percent) than low-sales operations (13.5 percent).

Overall, 40.3 percent of operations that brought on new animals or had animals leave and return always quarantined the new or returning animals, but almost half of operations (48.0 percent) rarely or never quarantined new or returning animals (figure 2).

Figure 2. For operations that brought on new livestock or poultry or that had livestock or poultry leave the operation and return during the previous 12 months, percentage of operations by how often new or returning animals were quarantined



Movement and quarantine

The addition of new animals to an operation is a potential route for disease introduction. In addition, animals that leave the operation and then return may have had contact with other animals, which presents the risk of introducing new disease. Proper quarantine of new or returning animals can prevent the introduction of acute infectious diseases to the herd or flock.

During quarantine, animals should be kept separate from the remainder of the herd or flock and be observed regularly for disease symptoms or fever. Separate equipment and clothing should be used when caring for quarantined animals. Operators should care for the established animals first and care for the new or returning (quarantined) animals last. Some diseases that do not manifest acute clinical signs, such as Johne's disease in cattle, cannot be effectively prevented by temporary quarantine. For these diseases, laboratory testing or other techniques can be utilized to help prevent disease introduction.

Overall, about 4 of 10 operations (39.3 percent) brought new livestock or poultry onto the operation during the 12 months prior to the study, and 13.9 percent of operations had livestock or poultry move off the operation and return during the same time period. The percentage of operations that brought new livestock or

A quarantine period of at least 21 to 30 days for new or returning animals is recommended for most livestock species. Operations that always quarantined new or returning animals during the previous 12 months kept the animals quarantined for a longer period (25.3 days, on average) than operations that sometimes quarantined new or returning animals (17.5 days, on average).

Barriers to implementing quarantine

As mentioned previously, about half of operations that added animals or had animals leave the operation and return rarely or never quarantined the new or returning animals, even though the introduction of disease can be very costly. Operators were asked to provide the reasons for not quarantining animals. For operations that **sometimes quarantined new or returning animals**, inadequate labor or time was cited as a reason for not always quarantining animals by 18.1 percent of operations. Trust the source of the new animals or the place from which animals returned was given as a reason for not quarantining animals by 67.5

² Farm sales categories (gross annual sales in 2010):
Low: less than \$100,000
Medium: \$100,000–\$249,999
High: \$250,000–\$499,999

percent of these operations (see table below), and lack of a separate enclosure or extra equipment was a reason for not quarantining on 29.5 percent of operations.

About 1 of 10 operations **that rarely or never quarantined new or returning animals** (11.4 percent) had “other” reasons for not isolating animals. The most commonly cited “other” reasons were all-in-all-out production and the belief that isolation was not necessary for their circumstances.

All-in-all-out production refers to a management practice in which all animals are removed from the operation, barn, room, or pen before new animals are brought in. The practice is common in poultry and swine production. All-in-all-out production is an effective biosecurity measure for preventing disease spread, especially when barns and equipment are cleaned and disinfected before new animals are introduced.

Interestingly, less than 6 percent of respondents believed that isolation is not beneficial, but some respondents felt that it did not apply to their situation.

For operations that sometimes or rarely or never quarantined new or returning livestock or poultry during the previous 12 months, percentage of operations by reason animals were not quarantined

Reason	Percent Operations Quarantined. . .	
	Sometimes	Rarely or never
Do not have a separate enclosure or extra equipment for isolating animals	29.5	27.9
Trust the source of the new animals or the place from which the animals are returning	67.5	64.8
Have inadequate labor or time to implement isolation	18.1	9.0
Don't believe isolation is beneficial or prevents disease	4.1	5.7
Other	5.6	11.4

Contact with other animals

Exposing animals to livestock from other operations in a commingled pasture or through fence-line contact are other routes for introducing disease to a herd or flock. Overall, only 8.4 percent of operations had livestock or poultry share a pasture at the same time with livestock or poultry from another operation during the previous 12 months. The percentage was higher in the West region (22.4 percent of operations) than in the North Central, Northeast, and South regions (8.8, 5.1, and 5.8 percent, respectively).

Having a perimeter fence and preventing fence-line contact with livestock from other operations reduces the

risk of introducing infectious diseases. Overall, about half of operations (51.8 percent) had a perimeter fence and no fence-line contact between their livestock and livestock from other operations. Fence-line contact with other livestock is not always preventable. Although a second fence can be constructed to prevent fence-line contact with neighbors’ animals, it can be very expensive.

Fencing is a more important biosecurity feature for some livestock species than for others. For example, swine and poultry operations often use a barn rather than fencing as a barrier for keeping out other animals. Barns are more effective than fences for preventing wildlife and outside animal access. Additionally, fencing is not relevant to biosecurity on some operations with “other” livestock species, such as aquaculture or bees.

Access to a veterinarian

Veterinarians, as resources for animal health, play an important role in the productivity of small-scale operations and the safety of the U.S. food supply; however, there might be a shortage of food-animal veterinarians in some rural areas. To address this issue, in 2010 the USDA implemented a plan which offered to repay the student loans of veterinarians who practice in underserved areas.

During the study, operators were asked about the distance to the nearest veterinarian that worked with their type of livestock, regardless of whether or not the operation actually used that veterinarian. Overall, 82.0 percent of operations had a veterinarian that worked with their type of livestock available within 29 miles of the operation. In the West region, about one of four operations (24.2 percent) was located 30 to 99 miles from the nearest veterinarian that worked with their type of livestock. For 0.9 percent of operations, no veterinarian was available or the nearest veterinarian was 300 or more miles away from the operation. Considering that there are about 350,000 small-scale livestock operations in the United States (NASS 2007 Census of Agriculture), this means that about 3,150 operations (0.9 percent x 350,000) either have no access to a livestock veterinarian or would have to travel 300 or more miles to reach one. Of operations that reported no veterinarian was available for their type of livestock, about 25 percent raised “other” livestock species such as aquaculture, fur-bearing animals, or bees.

About 7 of 10 operations in the North Central and West regions (72.8 and 71.2 percent, respectively) had used a veterinarian for their livestock or poultry during the previous 12 months, compared with fewer than 6 of 10 operations in the Northeast and South regions (59.0 and 54.8 percent, respectively). Overall, 62.0 percent of operations had used a veterinarian during the previous 12 months. Producers who did not use a veterinarian were asked why. Of the 38.0 percent of operations that did not use a veterinarian, only 12.4 percent did not use a veterinarian because it was too expensive. About two of three operations (65.8 percent) did not use a

veterinarian because there was “no disease or other need for a veterinarian,” and 44.2 percent did not use a veterinarian because the operator provided the animals’ health care.

Contacts in the event of a disease outbreak

If a foreign animal disease outbreak, such as foot-and-mouth disease, were to occur in the United States, early detection would be critical in mitigating the effects of the outbreak. Ensuring that the people most likely to be contacted in the event of an outbreak are aware of the appropriate procedures for reporting a potential outbreak will help speed diagnosis and response. Most operations (85.1 percent) would be very likely to contact a private veterinarian directly if they had an animal they suspected of having a foreign animal disease. This finding is consistent with findings from previous NAHMS studies on individual commodities (USDA, 2008, 2009).

Information and training needs

Operators of small-scale operations are a diverse group with varying levels of experience in farming. Many operators have spent a lifetime farming or ranching, while others are relatively new to the business. Based on research by the Economic Research Service in 2007, about 22 percent of all U.S. farms were operated by producers who had been in farming for 10 years or less (ERS, 2009). Federal agencies and universities provide relevant training and informational resources to assist small-scale operations.

During this study, topics in which small-scale operators wanted more training, as well as their preferences for receiving that training, were identified. The highest percentage of operations deemed training on animal health/diseases and how to transfer the farm to the next generation very useful (41.0 and 40.9 percent of operations, respectively). The highest percentage of operations preferred to get their training through the local extension office (56.0 percent) or via written publication (49.4 percent).

Summary

Practicing good biosecurity is an important part of animal health management and can reduce the risk of disease introduction and disease spread. About half of small-scale operations had multiple species present, which can have implications for disease transmission and, therefore, increases the need for good biosecurity practices.

Quarantine is an important biosecurity practice. About half the operations rarely or never quarantined new animals or animals that left the farm and returned.

In the West region, mobile slaughter services were used by about one of four operations. Depending on the biosecurity practices implemented by the providers of this service, use of mobile slaughter services could increase or decrease the risk of disease spread among operations.

Veterinarians play an important role in the productivity of small-scale operations. Many operations had not used a veterinarian during the previous 12 months. Some of these operations provided their own health care for livestock. In the event of a suspected or actual foreign animal disease outbreak, however, the majority of operations said they were very likely to contact a private veterinarian directly.

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