



Biosecurity on U.S. Sheep Operations

Good biosecurity practices should be part of the preventive health management plan of all operations. Biosecurity refers to preventing the introduction of new organisms to an operation as well as controlling organisms already present on the operation. Disease transmission from just one newly introduced animal to another animal in the flock can affect the health of the entire flock. Certain management practices can limit the transmission of disease from one location to another, or from one animal to another within a flock. These practices include: proper handling of new animals; using known sources for new breeding stock; good sanitary procedures during shearing; and controlling both human and vehicle entry onto the operation.

The USDA's National Animal Health Monitoring System (NAHMS) collected data on sheep health and management practices from a stratified random sample of sheep production sites in 22 States¹ as part of the Sheep 2001 study. These sites represented 87.4 percent of the January 1, 2001, U.S. sheep inventory and 72.3 percent of U.S. sheep producers. Overall, 3,210 operations participated in the first interview from December 29, 2000, to January 26, 2001. A second interview was completed by 1,101 of these operations between February 5, 2001, and April 27, 2001.

Flock Additions and Quarantine

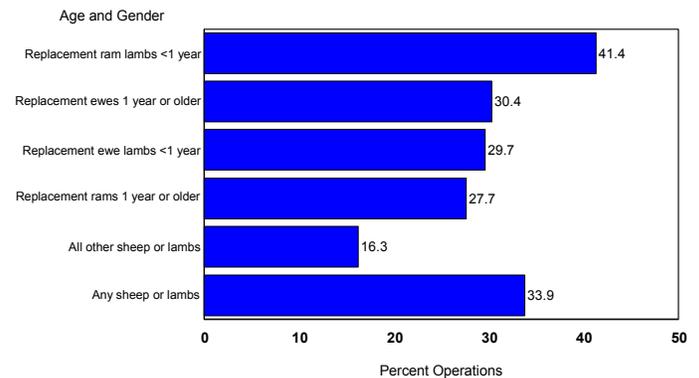
When adding sheep to the flock, knowing the health status of the source flock can be an important part of evaluating the risk these additions pose to the general health of the flock. The addition of new animals to a flock creates a potential risk for introducing disease, although isolating incoming animals prior to commingling them with the flock minimizes the risk. Overall, 66.5 percent of all range and farm flocks added rams or ewes during the 12 months prior to the interview. Only 4.3

percent of all operations indicated that their flocks had been closed (no new animals added) for at least 5 years.

Replacement ewes represented 42.2 percent of the animals added to range and farm flock operations in 2000. Very few new additions (4.5 percent) were replacement rams. The remaining 53.3 percent of animals added were most likely fed then sold to slaughter.

One-third (33.9 percent) of the range and farm flocks that added sheep or lambs in 2000 quarantined one or more of their new arrivals (Figure 1), which accounted for only 16.4 percent of new arrivals being quarantined.

Figure 1. Percent of Range and Farm Flock Operations* that Quarantined New Arrivals, by Age and Gender



*For operations that added the respective age and gender animals in 2000

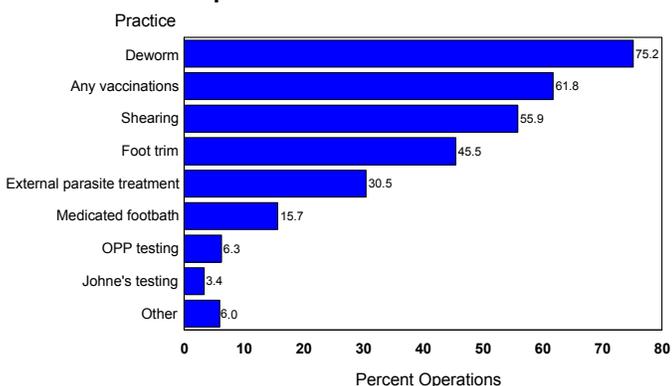
¹Arkansas, California, Colorado, Idaho, Illinois, Indiana, Iowa, Kansas, Montana, Minnesota, Nevada, New Mexico, Ohio, Oregon, Pennsylvania, South Dakota, Texas, Utah, Virginia, Washington, Wisconsin, Wyoming.

For operations that added sheep or lambs and quarantined these new arrivals, over 60 percent quarantined replacement ewes or rams for 7 to 30 days, regardless of their age. The percentage of operations that quarantined sheep for more than 30 days varied depending on the age and gender of the animals. In general, more than 20 percent of operations quarantined newly added replacement rams and replacement ewes for at least 30 days. Fewer operations (13.7 percent) quarantined newly added replacement ewe lambs.

On most operations, the following practices were performed on newly added sheep either prior to arrival at the operation or at the operation: deworming (75.2 percent); vaccination (61.8 percent); and shearing (55.9 percent). Few operations performed Ovine Progressive Pneumonia (OPP) testing (6.3 percent) or Johne's testing (3.4 percent) either before or after the animals arrived at the operation (Figure 2). However, if OPP tests were done, they were usually done prior to arrival at the operation. This was not the case for medicated footbaths, deworming, and external parasite treatments, where a larger percentage of operations performed these practices after the animals arrived at the operation.

Sheep obtained from locations known to have problems with anthelmintic-resistant worms should be dewormed prior to arrival and fecal tested to ensure that no resistant parasites are introduced into the flock.

Figure 2. Percent of Operations that Performed the Following Practices on One or More New Arrivals, Prior to Arrival or at the Operation.

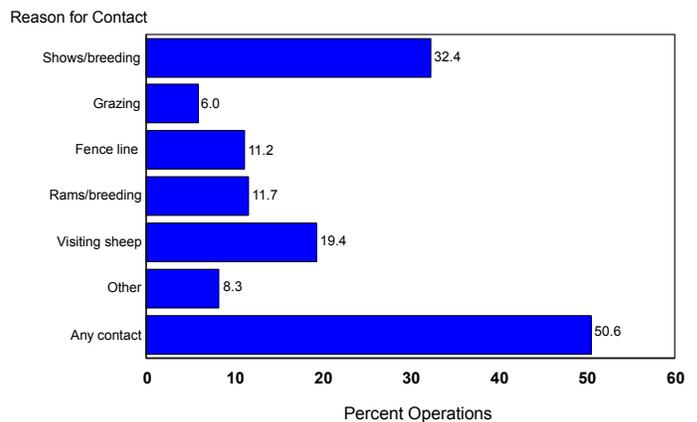


Contact with Sheep from Another Operation and Vaccine Use

Aside from new additions, there are other ways that an operation's sheep can come into contact with sheep from another operation (Figure 3).

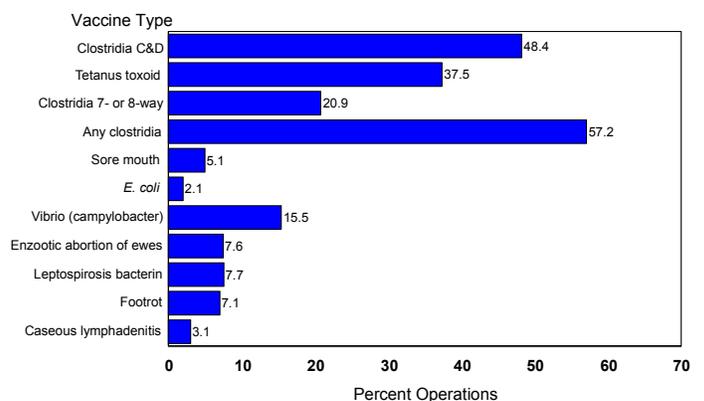
Overall, 50.6 percent of operations reported that their sheep had contact with sheep from another operation during 2000. Of these operations, 28.7 percent attempted to decrease nose-to-nose contact with other sheep.

Figure 3. Percent of Operations Where Sheep Had Contact with Sheep from Another Operation, by Reason for Contact.



Vaccination reduces the risk of sheep becoming sick when exposed to new pathogens. The percentage of operations that vaccinated was low for all vaccines listed. In 2000, the three vaccines used by the most operations for replacement or breeding ewes were: Clostridia C and D; Tetanus toxoid; and Clostridia 7- or 8-way (Figure 4). Only 15.5 percent of operations vaccinated for campylobacter, an economically devastating disease and one of the most significant causes of ovine abortions in North America.

Figure 4. Percent of Operations that Gave the Following Vaccines to Their Replacement or Breeding Ewes in 2000.



Visitor and Vehicle Restrictions

Some infectious agents can be spread via footwear and vehicles; therefore, limiting visitor access to sheep raising areas and disinfecting trucks that visit other operations are important biosecurity measures. Overall, 84.3 percent of operations allowed visitors access to sheep raising areas during 2000. Of these operations, only 22.6 percent had any biosecurity requirements for visitors. Restricting access to sheep raising areas was the most common requirement (15.9 percent of operations). "Other," e.g., footbaths or other methods of cleaning boots, was the next most common biosecurity requirement (5.8 percent of operations), followed by requiring that visitors had not been on another sheep operation for a specified time period (4.6 percent of operations), and requiring visitors to change boots or use boot covers (4.2 percent of operations).

Infectious agents also can be introduced by vehicles that make stops at other operations. Only 9.3 percent of operations used a livestock trucking company to transport sheep or lambs in 2000. However, 48 percent of these did not know if the trucks/trailers were disinfected prior to transporting their animals.

Manure Handling Practices

Using the same equipment for handling both feed and manure can lead to the spread of disease. Only 12.7 percent of operations used the same equipment to handle manure and sheep feeds.

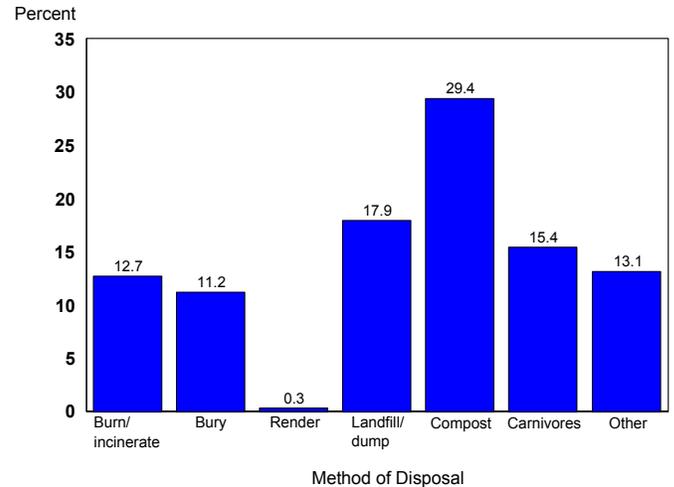
Access to Stored Feed and Sheep Facilities by Other Animals

Rodents, cats, and other wildlife may serve as a reservoir for various sheep diseases. Most operations (96.5 percent) used some method to control rodents. Cats were the predominant method of rat and mouse control in 2000 (82.1 percent of operations). Overall, 96.5 percent of operations had outdoor cats on-site. Allowing young cats access to stored hay and grain may increase the risk of ewes becoming newly infected with *Toxoplasma gondii*, an economically important cause of abortions in ewes. On operations where cats were present, 90.1 percent reported that cats had access to stored hay, and 47.0 percent reported that cats had access to stored grain.

Deer, elk, or moose had access to sheep raising areas on 58.3 percent of operations. Predators such as coyotes, bears, or wolves had

access to these areas on 66.2 percent of operations. Promptly removing carcasses and placental/fetal tissues not only reduces predator visits, but also decreases the risk of spreading infectious agents within a flock. Overall, 75.2 percent of operations removed placentas from pens or lambing areas. Composting was the most common method of placenta disposal (29.4 percent of operations). However, 15.4 percent of operations left placentas for carnivores (Figure 5).

Figure 5. Percent of Operations by Usual Method of Placenta Disposal.



Shearing

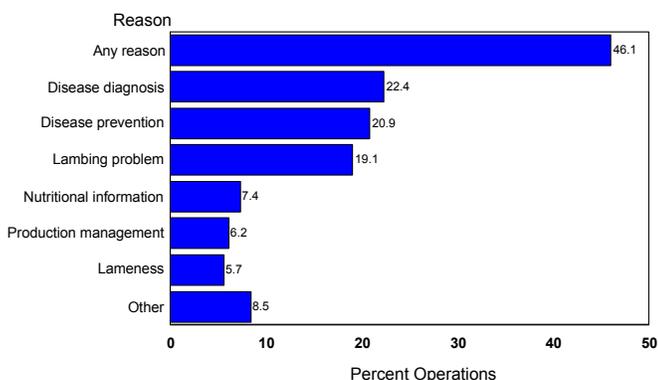
Overall, 90.4 percent of operations sheared at least one sheep or lamb during 2000. Shearing was typically performed by a hired individual (65.3 percent of operations) rather than by employees (21.2 percent of operations) or contracted shearing crews (15.1 percent of operations). This was true for all operations except those with 1,000 or more sheep, where 89.6 percent used contracted shearing crews.

New infections (e.g., caseous lymphadenitis) can be both introduced or spread within a flock during shearing, especially when shears are not disinfected between sheep. Only 5.2 percent of operations always disinfected shears between sheep. More than half (59.7 percent) of operations never disinfected shears between sheep. Shearing the youngest animals first and working toward the oldest reduces the spread of infection within a flock. Only 2.3 percent of operations sheared the youngest sheep first, while 4.1 percent sheared purposely from the oldest to the youngest sheep.

Use of a Veterinarian

A veterinarian can help identify and manage biosecurity problems, recommend and administer vaccinations and other preventive measures, and develop a routine flock health program designed to reduce biosecurity risks. Nearly half (46.1 percent) of all operations consulted a veterinarian during 2000. Disease diagnosis, disease prevention, and lambing problems were the top reasons given for veterinary consultation (Figure 6). On average, operations with less than 25 sheep and lambs consulted a veterinarian less often than larger operations.

Figure 6. Percent of Operations that Consulted a Veterinarian During 2000, by Reason.



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