Biosecurity

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Interestingly, when I type in the word “biosecurity” into my computer, the spell checker underlines it in red to inform me that I have misspelled the word as this word is not in the computer’s dictionary. This same phenomenon occurs when I am making handouts for classes and use terms and conditions that apply to veterinary students. It surprises me that biosecurity falls into that “obscure” category when the principles of biosecurity have been around for years and are really the cornerstone of all preventive health programs.

Biosecurity: is a word that describes programs for the control of infectious diseases by reducing and or preventing the new introduction of disease on to a farm and by reducing and or preventing the movement of diseases between groups of animals.

Essentially what one is attempting to do is control the spread of pathogens. Pathogen can be defined as any infectious agent that causes disease, in our case diseases that occur in sheep.

Why is biosecurity important?

Pathogens that enter or circulate within animal populations may have a devastating effect on animal performance and consequently cash flow. In the case of the introduction of a foreign disease pathogen, such as Foot and Mouth Disease, not only would the entire herd be devastated but the whole industry of animal production would be negatively impacted.

The greatest disease threat to a sheep is from another small ruminant, whether through direct contact or through surfaces, equipment or people contaminated by diseased animals.

There are some diseases that can be easily observed, for example pneumonia and diarrhea. Animals that are affected with these 2 maladies can be removed from the rest of the herd or in the case of bringing new animals to the farm, avoided. Although clinically ill animals present a threat to the health of the herd, animals that are in the very early stages of disease and not showing symptoms are a bigger threat. Like many things in life, if you can’t see it, it isn’t a problem but we all know that is not the case. Just think about food poisoning. We never see the pathogen in the food we eat yet we certainly suffer from the consequences of its presence. There are many pathogens that sheep can harbor without being visible until the last stages of the disease state.

Because non resident animals are the biggest threat to the resident animal population in regards to pathogen spread, it is important to develop a plan to reduce that risk. In the development of a plan to reduce disease risk, common sense must prevail! There is no point in developing a restrictive plan if it can not be implemented. Likewise, if a plan is put in place
and then violated the plan really doesn’t exist. For example, a farm doesn’t allow visitors, yet the owner purchases animals from a stockyard and places them directly into the herd.

**Pathogens are spread among animals and populations thru:**

a) Animal to animal contact.
b) Shedding of the pathogen in the fecal material which contaminates the environment.  
c) Respiratory secretions and movement through the air.  
d) Body secretions (nasal discharge, urine, draining abscesses, uterine fluids) contaminate the environment.  
e) Parasites, such as lice, mites, ticks, can carry pathogens  
f) Fomites – articles that are shared between animals; for example a hair brush, clippers.  
g) Feed – pathogen gets into the feed and then animals consume the feed.  
h) Water – acts as a central source of the pathogen or pathogen could be carried in via water as in the case of a stream.  
i) Feet (clothing, shoes, hands), the pathogen is “carried around”.  
j) Wildlife

**Methods to control the introduction of pathogens**

1) Closed farm  
   - no animals are brought into the farm  
   - if animals leave the farm, they are not allowed to return. For example – no show animals.  
   - no people are allowed to enter the farm and have contact with animals  
   - not very practical for a farm that is trying to develop genetic diversity or increase animal numbers

2) Bring in only healthy animals and people  
   - animal is healthy  
   - although apparently healthy, the animal could be infected but is not yet showing clinical signs.  
   - the animal may have already had clinical signs of the disease but is now healthy. However the animal still carries the pathogen, a reservoir.  
   - the animal (people) has picked up a pathogen and is just transporting it.

3) Inspect the animals closely, the ones you are interested in and others on the farm  
   - are they in good body condition  
   - do they have a nice coat  
   - what condition are their feet/hooves and legs in  
   - make the animals move, do they cough, increase in the respiratory rate  
   - body fluids - fecal output, vaginal discharges, nasal secretions, udder
4) Buy from a known source of animals.
   - ask if any animals have experienced diseases, if so what kind – don’t be shy; these new animals you are purchasing have the potential to destroy your flock.
   - are there any disease problems currently or have there been in the past.
   - what kind of health program do the animals receive, is it similar to yours?
   - how many new animals has this individual purchased in the past year, sources of those animals – if animals have been purchased within the past 2-3 weeks, hold off in buying animals as the new animals could have brought in a pathogens that is brewing in the resident herd.

5) DO NOT BUY FROM THE SALE BARN
   - why are those animals there?
   - animals from multiple sources.
   - animals have been in an environment that has had thousands of animals pass through, not only small ruminants but most likely cattle and horses.
   - animals may have passed through several stockyards before coming there. This moving around increases exposure and susceptibility to pathogens.
   - How do the above differ from going to a show or fair grounds?

6) Quarantine
   - all animals entering the farm should be quarantined. This includes animals that leave the farm for breeding or exhibitions – shows or fairs.
   - there are two major reasons to place an animal in quarantine upon entry on to the farm.
     a) protect the animals that are already on the farm (resident population) from disease pathogens that may be carried by the new or returning animal.
     b) protect the new or returning animal from acquiring infections from the resident animals.

Animals that are transported are under stress. This stress weakens the immune system and renders the animal susceptible to infection. Some pathogens live “normally” in the animal and wait for an opportunity to cause disease. It is during these times of stress, that opportunistic pathogens produce disease. Likewise, stressed animals secrete higher numbers of pathogens that results in contamination of the environment that could infect the resident animals. Obviously if the new animal brings in new pathogens that the resident flock has not encountered before, the resident animals lack immunity and therefore succumb to disease. Placing animals in quarantine allows closer observation of new animals in case a disease condition occurs in which case early treatment can be administered. While in quarantine, new animals can acclimate to the feed, water and “rest” from their recent trip. This allows them to be better prepared to withstand the pathogen challenges as well as other challenges it will face when first entering the herd.

Quarantine animals before mixing with resident animals
   - place animals away from the rest of the herd – 30 yards – or as far away as possible.*
   - don’t place animals in a place that is used by the herd, like a kidding barn.*
   - attend to these animals last after dealing with resident animals*
- change cloths, shoes or wear disinfectable boots, after handling animals
- WASH YOUR HANDS, between handling groups of animals*
- keep isolated for 30 days*
- serology testing
  - OPP, Johnes, Caseous lymphadenitis
- trim feet,* soak feet in a sodium sulfate solution for 20 minutes.
- vaccinate so the new animals are vaccinated with the same vaccines as resident animals
- inspect animals for abnormal conditions before releasing*
- deworm animals upon entry into quarantine and as they exit.* Use 2 different classes of dewormers together, for example a white drench, levamisole, or an ivermectin.
  **This is extra label usage and should only be done under the direction of your veterinarian.**

3. Equipment
   Equipment may act as a vehicle to bring disease to your animals
   - when purchasing new animals, the vehicle should be cleaned prior to placing animals in it, especially if you are borrowing someone else’s vehicle.
   - truck tires may carry fecal material and disease agents. Keep this in mind if your vehicle goes on a premise that is a high traffic area for animals. For example a sale barn, slaughter facilities, shows.
   - halters, grooming equipment, foot trimmers should be cleaned and disinfected between animals.

4. Animals
   a) Wildlife
      Wildlife may present an opportunity for the transmission of disease. Raccoons can carry rabies. Deer carry the deer worm. Rodents carry a variety of diseases transmissible to sheep. Keep grain contained. Waterfowl may contaminate water sources if a pond or stream is used as the primary source for water.
   b) Pets
      Cats may carry toxoplasmosis, a disease that causes abortion. The organism is transmitted through the cat’s feces. Keep cats out of feed, off of hay bales.

5. People
   Humans can bring disease agents to your farm.
   a) Ask if they own sheep, or other animals.
   b) Ask if they have visited any farms lately.
   c) Ask if they have been to a foreign country within the past 5 days, did they wear any of the cloths that they have on now in that country.
   d) Inspect their shoes. Shoes are a great means by which disease agents can be spread from one locality to another.
      - dip shoes in disinfectant foot bath
      - provide boots
   e) Shows – people pet one animal and then pet another

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Biosecurity within the farm

1) Work with the youngest of stock first and work your way through to the oldest and then those in quarantine. Most pathogens that baby or young animals acquire are acquired through older animals. By dealing with the young first, one reduces the chance of spreading disease agents.

2) Disinfect equipment between classes or groups of animals. Ideally there should be a rake/shovel, broom, or whatever equipment is used for each building or livestock group.

3) If there are sick animals, isolate them. Treat them after you have taken care of the other animals. Change cloths and wash hands after taking care of sick animals.

4) Water sources.
   - if water is acquired through a stream, what is up stream that may affect your animals? Pond water, fence off.