IANR NebGuide
University of Nebraska Lincoln
Published by University of Nebraska–Lincoln Extension, Institute of Agriculture and Natural Resources

G1411

Biosecurity Basics for Cattle Operations and Good Management Practices (GMP) for Controlling Infectious Diseases

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This NebGuide introduces cattle producers to the concept of biosecurity and provides practical management recommendations for preventing and/or containing infectious disease.

Biosecurity

The goal of biosecurity is to stop transmission of disease causing agents by preventing, minimizing or controlling cross-contamination of body fluids (feces, urine, saliva, etc.) between animals, animals to feed and animals to equipment that may directly or indirectly contact animals. Biosecurity management practices are designed to prevent the spread of disease by minimizing the movement of biologic organisms and their vectors (viruses, bacteria, rodents, flies, etc.) onto and within your operation. Biosecurity can be very difficult to maintain because the interrelationships between management, biologic organisms and biosecurity are very complex. While developing and maintaining biosecurity is difficult, it is the cheapest, most effective means of disease control available, and no disease prevention program will work without it.

Infectious diseases can be spread between operations by:

- the introduction of diseased cattle or healthy cattle incubating disease,
- introduction of healthy cattle who have recovered from disease but are now carriers,
- vehicles, equipment, clothing and shoes of visitors or employees who move between herds,
- contact with inanimate objects that are contaminated with disease organisms,
- carcasses of dead cattle that have not been disposed of properly,
- feedstuffs, especially high risk feedstuff which could be contaminated with feces,
- impure water (surface drainage water, etc.),
- manure handling and aerosolized manure and dust,
- nonlivestock (horses, dogs, cats, wildlife, rodents, birds and insects).

Develop a Biosecurity Resource Group

The first step is to develop a *biosecurity resource group/ team*. The group should include people important to the success of your operation such as your operation supervisors, veterinarian, nutritionist, extension specialist, suppliers and others that may have special knowledge in control of biologic organisms. Generally beef operations have been open to vehicle traffic and visitors. Of all the possible breakdowns in biosecurity, the introduction of new cattle and traffic pose the greatest risks to cattle health. Properly managing these two factors should be a top priority in your operation. Biosecurity plans should be developed to meet the specific needs of each operation.

Biosecurity has three major components: **Isolation, Traffic Control, Sanitation.**

When effectively managed these components meet the principle biosecurity objective of preventing or minimizing cross-contamination of body fluids (feces, urine, saliva, respiratory secretions, etc.) between animals, animals to feed and animals to equipment.

Isolation prevents contact between animals within a controlled environment. The most important step in disease control is to minimize commingling and movement of cattle. This includes all new purchases as well as commingling between established groups of cattle. Even in operations that have high cattle turnover, such as feedlots, keeping feeding groups from mixing is an import biosecurity measure. Isolate feedlot hospital cattle and return them to their home pen as soon as possible. Long acting therapies have improved our ability to minimize movement of infectious organisms between groups. An important biosecurity action on ranches is to separate cattle by age and/or production groups. Facilities should be cleaned and disinfected appropriately between groups. Visit with your veterinarian about specific isolation management procedures and how they can be applied to control targeted diseases.

Traffic control includes traffic onto your operation and traffic patterns within your operation. It is important to understand traffic includes more than vehicles. All animals and people must be considered. Animals other than cattle include dogs, cats, horses, wildlife, rodents and birds. The degree of control will be dictated by the biology and ecology of the infectious organism being addressed, and the control must be equally applied.

Stopping a truck hauling cattle from driving onto your operation as a biosecurity measure for controlling BVD may not be beneficial since the virus is spread from animal to animal. Purchasing cattle from herds that have a verifiable quality vaccination program would be more important in maximizing biosecurity. However, it would be important for the pot to have been adequately cleaned before hauling the cattle. Traffic control can be built into the facilities design. An example would be placing cattle loading facilities on the perimeter of the operation.

Traffic control within the operation should be designed to stop or minimize contamination of cattle, feed, feed handling equipment and equipment used on cattle. Pit silos should not be accessible from nonfeed handling equipment such as loaders used outside the feeding area or vehicles that travel outside the feed mixing and handling facility. No one (manager, nutritionist, veterinarian, banker — **no one**) should be allowed to drive onto the surface of a trench silo. The only equipment allowed should be the loader used for handling the feedstuff. In large pits, it may be acceptable to allow feed trucks to enter, provided they are loaded at least 100 feet away from the working face of the stored feed. If possible, separate equipment should be used for handling feedstuffs and manure.

Vehicles and employees should not travel from the dead cattle area without cleaning and disinfecting. The dead animal removal area should be placed in a location that allows rendering trucks access without cross-contaminating healthy cattle. Vehicle cleaning areas are becoming more common in commercial feedlots. Unfortunately they are frequently used only for trucks and heavy equipment. Management should consider extending a decontamination policy to other vehicles (especially tires) that are used across biosecurity control areas on the operation. Ask your biosecurity resource team to help you evaluate traffic control on your operation.

Sanitation addresses the disinfection of materials, people and equipment entering the operation and the cleanliness of the people and equipment on the operation.

The main objective of sanitation is to prevent fecal contaminates from entering the oral cavity of cattle (fecal - oral cross contamination). Equipment used which may contact cattle's oral cavity or cattle feed should be a special target. The first step in sanitation is to remove organic matter, especially feces. Blood, saliva, and urine from sick or dead cattle should also be targeted. All equipment that handles feed or is introduced into the mouth of cattle should be cleaned, including disinfection as appropriate, before use. Loaders used for manure or dead cattle handling must be cleaned thoroughly before using for feedstuff. It would be best to use different equipment. Minimize the use of oral equipment and instruments such as balling guns, drench equipment and tubes. If used at processing and treatment, thoroughly clean and disinfect between animals. Store cleaned equipment in clean, dry areas. Avoid storage in tanks or containers containing disinfectants because most disinfectants are neutralized by organic material. Disease transmission is commonly traced to the use of those storage tanks.

Specific Biosecurity Information is Important

For more detailed and specific information about applying biosecurity principles to your operation, contact your veterinarian or Cooperative Extension specialist.

GMP for Controlling Infectious Diseases

Develop a biosecurity plan and commit to its implementation. Committing to a biosecurity plan is a vital step toward controlling of infectious disease. Keeping pathogens out of a herd improves production efficiency, lowers costs and reduces risks to employees and family.

Biosecurity GMP Checklists

Review the checklists below and discuss each item with your veterinarian. Ask your veterinarian to rank the biosecurity importance of each item (0=not important, 5= very important). Check Y (yes) or N (no) if the biosecurity item is being addressed.

General Good Management Practice (GMP) Checklist

Notes *Rank importance of each GMPs in biosecurity and note if being addressed:*

_____ Meet all of the Beef Quality Assurance Good Management Practices and Guidelines.

_____ Understand it is more profitable to prevent problems than to correct problems.

_____ Agree that doing things right the first time is a critical part of biosecurity.

_____ Biosecurity requires some method of cattle identification. An identification system in place.

_____ Can readily track and validate management practices used on my cattle.

GMP Checklist for Sanitation

Notes *Rank importance of each sanitation measure in biosecurity and note if being addressed:*

_____ Attempt to prevent manure contamination of feed and equipment used orally.

_____ Clean equipment used orally between animals.

_____ Attempt to prevent cross contamination between healthy and sick/dead cattle.

_____ Regularly evaluate the activities on my operation to assess the potential for contaminating cattle.

_____ If manure accidentally contaminates feed or water, an immediate remedy is provided.

GMP Checklist for Equipment

Notes *Rank importance of each equipment item in biosecurity and note if being addressed:*

_____ Use different equipment to feed and to clean pens or completely clean between use.

_____ Never step in the feed bunk.

_____ Never leave manure-hauling equipment in pens with different groups of animals.

_____ Clean contaminated vehicles and equipment before use around healthy cattle.

_____ Routinely clean and disinfect feeding equipment and cattle handling equipment.

_____ Routinely clean and disinfect equipment used to medicate cattle.

GMP Checklist for Disease Containment

Notes *Rank importance of each disease containment item in biosecurity and note if being addressed:*

_____ Facilities provide a clean area for restraint, treatment and isolation of sick cattle.

_____ Facilities prevent cross contamination of water, manure, feed, or equipment between groups.

_____ Have a plan to manage group size, age distribution, and animal flow to reduce risk of disease.

_____ Handle highest health status animals first *(young calves, healthy older cattle and sick animals last).*

_____ Everyone uses strict sanitation practices

_____ All animals that die are examined by a veterinarian *(necropsy).*

_____ Veterinarian collects blood samples from all cows that abort.

_____ Have visitors observe our strict sanitation practices.

_____ Clean contaminated vehicles and equipment before use around healthy cattle.

GMP Checklist for Preventing Infectious Disease from Entering All Operations

Notes *Rank importance of each disease entry item in biosecurity and note if being addressed:*

_____ Know the health history of the herds from which cattle are purchased.

_____ Know the health status of animals brought into my operation.

_____ My veterinarian talks to the seller's veterinarian prior to buying animals.

_____ Never bring in animals without knowing their vaccination history.

_____ Never buy animals from a herd that has mixed origin cattle.

_____ Transport animals in clean vehicles.

_____ Have a control program for outside animals which could spread disease (rodents, etc.).

_____ Loading area is located at the perimeter of the operation.

_____ Dead animal pickup area located so rendering trucks do not contaminate my operation.

_____ Limit people's access to my cattle pens, feed mixing and storage area, and treatment area.

_____ Keep a record of visitors to my operation.

GMP Checklist for Preventing Infectious Disease from Entering Cow/Calf Operations

Notes *Rank importance of each disease entry item in biosecurity and note if being addressed:*

_____ Cattle don't use community pastures, or are not placed in performance evaluation centers.

_____ Cattle do not share fence lines with neighbor's cattle.

_____ Do not purchase, borrow, or use loaner bulls from other farms.

_____ Buy cattle from a Johne's certified free farm.

_____ Limit purchases to open heifers and virgin bulls.

_____ Know the biosecurity, vaccination, and testing program of herd(s) for my replacement cattle.

_____ Quarantine new arrivals for 21-30 days before allowing them contact with my cattle.

_____ Quarantined area is designed to prevent cross contamination between cattle.

GMP Checklist for Calf Management

Notes *Rank importance of each calf management item in biosecurity and note if being addressed:*

_____ Have a strategic vaccination and parasite control plan in place for all cows.

_____ Replacement cattle are kept off pastures where manure has been spread for six months.

_____ Replacement cattle are kept separate from other cattle for at least six months.

_____ Replacement cattle have a separate source of water.

_____ Consult with veterinarian annually about calf care.

_____ Calving area is clean and disinfected.

_____ All calves are born from cows that have been tested clean of infectious diseases.

_____ All colostrum fed to calves comes from cows that have been tested clean of infectious diseases.

_____ Calves are permanently identified prior to any grouping.

GMP Checklist for Strategic Vaccine Use

Notes *Rank importance of each strategic vaccine item in biosecurity and note if being addressed:*

_____ Have a written strategic vaccination plan for *my* operation.

_____ Know when and how to use the vaccines listed in the vaccination plan for my herd.

_____ Discuss the vaccination history of all cattle purchased before the cattle enter my operation.

GMP Checklist for controlling Johne's (*M. paratuberculosis*) Disease

Notes *Rank importance of each Johne's control item in biosecurity and note if being addressed:*

_____ Understand how Johne's disease can impact my herd and how it is spread.

_____ Whole herd is screened using an antibody ELISA test *(measures antibody in blood).*

_____ Whole herd is tested using a fecal culture.

_____ Animals testing positive are culled. *(Johne's is reportable disease in some states.)*

_____ Replacement heifers are tested prior to introduction to the herd.

_____ Calves from cows testing positive are removed to a feedlot.

_____ Have implemented a follow-up Johne's testing program and reviewed the results with my vet.

GMP Checklist for controlling Bovine Leukosis

Notes *Rank importance of each Leukosis control item in biosecurity and note if being addressed:*

_____ Are needles and sleeves used on more than one animal?

_____ Are cows which provide colostrum for your calves tested for bovine leukosis?

_____ Purchased cattle are tested during quarantine.

GMP Checklist for controlling Bovine Viral Diarrhea (BVD)

Notes *Rank importance of each BVD control item in biosecurity and note if being addressed:*

_____ Understand "persistently infected" (PI) animals as they relate to BVD.

Am not willing to live with one or more PI calves in my herd.

_____ Am not willing to keep a PI calf as a replacement heifer.

_____ Am committed to finding BVD PI cattle and removing them from herd.

_____ Have discussed killed versus modified live virus (MLV) vaccines for BVD with my veterinarian.

GMP Checklist for controlling Salmonella

Notes *Rank importance of each Salmonella control item in biosecurity and note if being addressed:*

_____ Realize that my family and employees can be infected with salmonella from cattle.

_____ Isolate sick cattle in hospital area and prevent cross contamination.

_____ Discuss proper antibiotic use with my veterinarian.

_____ Clean all instruments and equipment used on sick cattle between cattle.

_____ Provide dry, clean, disinfected calf and maternity pens.

_____ Test purchased feed for salmonella once per year.

_____ Restrict birds, cats, rodents and stray animals from access to my operation's animal feed and water.

_____ Do not allow rendering trucks to access feed or animal areas.

References

Carlson, K. R., Biosecurity – Profit for the Taking!, Good Management Practices for Controlling Infectious Diseases, Dairy Today Supplement, Agri-education, Inc. Dairy Quality Assurance Center. 1998.

Howard, J. and Smith, R.A., Current Veterinary Therapy: Food Animals, 4th Ed. Saunders, 1998.

Jeffrey, J.S., Biosecurity for Poultry Flocks, Extension Poultry Veterinarian, University of California-Davis. 1997.

McFarlane, A., A Briefing on Biosecurity Procedures. Prairie Swine Centre Inc. 1999.

Smith, B.P., Large Animal Internal Medicine. Mosby, 1990.

Spencer, J., Development of composting and management strategies for elimination of animal pathogens and assay systems to monitor effectiveness, Canadian Food Inspection Agency. 1996.

Wallace, R.L., Consider Biosecurity Steps When Expanding Herd. University of Illinois, College of Veterinary Medicine. 1996.

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2000, Revised December 2007