Biosecurity for the Beef Herd

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Farm biosecurity best management practices (BMP) are an integral part of controlling any disease that can enter your farm through foreign sources. Biosecurity is the cheapest and most effective method of disease control since vaccinations cannot eliminate disease and treatment can only reduce losses. Transfer of most cattle diseases occurs by contact of cattle blood, saliva, manure, urine, or aerosolized particles. Focus on reducing contact from animal to animal or animal to object to animal. This is best done by a combination of animal isolation, control of movement onto and around the farm, proper insect control, as well as cleaning and disinfection.

Animal Isolation and Herd Testing

The single biggest biosecurity risk is the addition of new animals to a herd. Spread of cattle disease is by contact between cattle and limiting this contact is the most important part of biosecurity. Newly arriving cattle should be isolated from other cattle for a minimum of 30 days. Separation of the isolation area needs should be away from any other cattle housing areas and is best located where drainage and prevailing wind direction is away from the rest of the farm. Request health records for all incoming animals and then monitor closely each day for early signs of disease. Implement a program that routinely monitors the herd for the presence of important infectious agents. Test for common diseases, such as bovine viral disease, anaplasmosis, bovine leukosis virus, and Johne's disease, early in the isolation period so the results will be available before comingling animals with other cattle on the farm. Consult with your veterinarian to develop a protective biosecurity testing program.

Deworming and vaccinating these animals are also worthwhile. Sick animals should also be isolated until all signs of disease are gone for at least one week. Separate weaned, younger cattle from older animals since they are still building immunity and are generally more susceptible to disease. Handle animals in isolation last. Do not handle any other animals on the farm after handling isolation animals. Dead animals should be disposed of by rendering, burning, deep burial or composting so that they do not serve as a source of disease to live animals. Submit dead animals for a necropsy if there is any question as to why the animal died to determine the cause of death.

Animal Housing and Facilities

Implement sanitation measures for calving pens, barns and other facilities. Maintain facilities and clean on a regular basis to help reduce the possible transfer of a disease in a herd. Pathogens normally living in the air that cause respiratory diseases will become dangerous if they find favorable conditions. Animal overcrowding, high air humidity, air with too many dust particles, draughts and excessively high air temperature are all factors that contribute to diseases. It is advisable to limit the number of pathogens living in the air because it is not possible to destroy them. Noninfectious contaminants, such as inert dust particles and ammonia gas, can also harm animals by causing damage to the respiratory defense

mechanism. Such agents can make the animal less resistant to infection.

Good ventilation and a favorable animal density are two important measures to prevent respiratory diseases. For prevention of contagions infections within the herd, recommendations are to isolate ill animals as soon as possible. Design facilities with enough room or pens for potential numbers of sick animals.

Consider different age groups when building facilities. The cohabitation of animals of various age and the comingling of animals from different farms represent a situation with many disease risks. A quarantine practice (facilities plus management) for purchased animals is advisable to diminish the risk of disease outbreak. Dominant animals frequently disturb submissive animals so limit the number of animals per pen to no more than 12 to prevent social pressure.

Disinfection and Cleaning

Disinfection means to render an object free of germs. Some common examples of objects that can spread disease are handling facilities such as chutes, balling guns, stomach tubes, dehorners, castration equipment and any other object used on more than one animal without proper disinfecting. It is best to discard disposable syringes and needles once used. Do not use disinfectant on needles and syringes, as this will render vaccines useless. For disinfection to be effective, the object must be clean. A thorough scrubbing with soap and water followed by rinsing will remove most germs. The presence of manure or other body fluids such as saliva will make disinfectants ineffective. Several good disinfectants are available from animal health product suppliers and are very effective if used as directed (Table 1). A commercial disinfectant that is available is chlorohexidine. It is offered as a 2 percent solution.

Disinfectants will work well if:

- The object is clean. Remove any manure, blood or saliva on the object.
- The disinfectant is effective against a wide variety of common germs.
- The disinfectant is properly mixed. Too little or too much in a solution will cause reduced efficacy. Always follow label directions for mixing.
- The disinfectant is in contact with the object for at least five to 10 minutes.

Hypochloric acid (bleach) is a commonly used, inexpensive and effective disinfectant for which directions for use are not available on the label. Some points to remember about the use of bleach as a disinfectant include:

- Never mix bleach with ammonia or vinegar because the mixture will produce toxic fumes.
- Bleach is often used in too concentrated a form. A mixture of one-eighth to one-half cup per gallon of water is adequate.
- Bleach solution for disinfection cannot be stored. Mix daily for effective solutions.
- Bleach is corrosive to metals, deteriorates fabrics, irritates skin, and some individuals are very sensitive to bleach fumes. Always use outdoors.

General Facts About Disinfectants

SA = Some Activity
E = Equipment
P = Premises
F = Footbaths
C = Clean Equipment

(Adapted from Purdue University Extension Bulletin PIH80f)

Chlorhexidene	SA	SA	SA	SA	Most	Wide range	Good E P F	EPF
Formaldehyde and aldehydes	++	++	++	++	++	Wide range	Good E P F	EPF
Chlorine chloramines	++	++	SA	++	SA	Acid	Very poor C E	CE
Iodophors	++	++	SA	++	SA	Acid	Fair to poor C E	CE
Sodium hydroxide	++	++	SA	++	++	Alkaline	Good P	P
Quaternary ammoniums	++	+	No	SA	SA	Alkaline	Fair C E	CE
Phenols	++	++	+	SA	SA	Acid	+Good E P F	EPF

Maintaining Secure Feed and Water Supply

Farm inputs such as feed and water have the potential for the introduction and spread of pathogens. Monitor any commodity purchased and brought onto the farm to ensure that they do not contain pathogens, chemicals or animal byproducts. Handling, management and storage of these commodities may have an impact on animal and human health. Some best management practices are:

- Ensure traceability of all feedstuffs coming onto the farm.
- Purchase feed from reputable suppliers who maintain a Hazard Analysis Critical Control Points (HACCP) Program with a biosecurity component.
- Keep a log of all feed and feed ingredients received on the farm.
- For feed produced on the farm, be able to identify all treatments applied to your crops (e.g., pesticides, fungicides).
- Minimize feed contamination on the farm by using proper storage facilities that prevent access of birds, dogs, cats, cattle and other wildlife.
- Label all chemicals, pesticides and medications appropriately and keep in a separate area from feed.
- Establish storage facilities for feeds for various classes of cattle to avoid errors in feeding practices. Store medicated feeds separately from nonmedicated feeds.
- Clean all storage areas (silos, bins and commodity sheds) between batches of feed.
- On a daily basis, clean feed bunks/mangers of feeds not consumed and other sources of contamination and pick up any spilled feed.
- Ensure all feed mixing and delivery equipment is cleaned out between uses.
- Routinely test all feeds for nutrient content as recommended to provide consistent and adequate cattle nutrition. Rebalance rations as necessary.
- Keep a record of feed testing results.
- Ensure compliance with federal regulations regarding the prevention of Bovine Spongiform Encephalopathy (BSE), which prohibit the feeding of animal materials to ruminants.
- Rotate inventory to limit feed spoilage among stored feeds.
- Examine feedstuffs closely for contamination and spoilage before feeding. Reject feeds with visible mold, contamination, spoilage, unexplained discoloration or unusual odor.

Water

Water is a potential source of disease bacteria or viruses. Prevention and control measures can minimize, if not eliminate, this risk. Sources of water that are susceptible to bacteria include surface water, groundwater and rainwater collection systems. Practical examples of best management practices include keeping watering sources clean and clear of dead birds and rodents.

An additional source of disease spread from water to cattle is through manure. Producers must be strictly cautious of keeping water sources free from manure contamination. Best management practices include:

- Preferably use municipal or deep-drilled well water sources.
- Protect water supply areas (well area, ponds and streams) from fecal and chemical contamination and other runoff contaminants.
- Use a diagnostic laboratory to test water annually or more frequently if there is a problem.
- Record test results or any problems with water quality.
- Ensure there is sufficient access to water so that all cattle have a continuous supply of clean, fresh, uncontaminated water.
- Position waterers for easy and safe access for cattle.
- Design and install waterers to reduce the risk of contamination and allow for easy cleaning.
- Have procedures in place for regular (daily or weekly) cleaning of waterers (tanks, troughs, bowls and buckets).

- Provide adequate drainage in cattle-holding areas to minimize the pooling of water, manure and urine.

Securing Your Farm

An overlooked component of biosecurity is controlling traffic and visitors on to the farm. Introduction and spread of pathogens occurs by contaminated footwear, clothing and hands, as well as on vehicles, farm machinery and other equipment. Minimize the risks of people, vehicles and equipment transmitting pathogens to cattle by implementing some of the following steps:

- Establish perimeter control with fencing and gates to reduce the number of entry points.
- Secure entry (e.g., have the ability to lock) to high-risk areas such as:
    - Animal housing.
    - Feed storage.
    - Chemical storage.
- Post signage that is clearly visible at all access points and provides clear instructions, including information on who to contact upon arrival, where to report, and what biosecurity measures to follow, such as:
    - Only permit access to the cattle housing area and other high-risk areas if required.
    - Instruct visitors not to touch the animals unless it is part of their job.
- Designate a specific parking area for visitors and employees that is away from the cattle and not shared with farm vehicles.
- Have a single, clearly marked entrance for all visitors.
- Restrict access to all high-risk areas, including cattle housing facilities, to essential personnel only.
- Designate one area where visitors enter and congregate outside of the production area.
- Determine the required biosecurity measures for all visitors. Have a pre-established arrangement for the supply of suitable clean clothing and footwear.
- If visitors or service providers are bringing their own footwear, require that they brush wash them to remove contamination and disinfect upon arrival. Visually inspect all personal clothing for gross contamination.
- Require that all visitors and service providers put on clean coveralls and footwear prior to entering the production area, especially if there will be any planned contact with animals, feed or manure.
- Ensure all visitors and service providers clean their footwear when moving between different animal housing areas.
- Provide disposable sleeves and gloves if there is contact with cattle.
- Collect all farm-dedicated or disposable clothing and footwear after each visit and dispose of them appropriately.
- Require disinfecting of all boots taken off the farm and removal of outer clothing before leaving.

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