Biosecurity in Practice Series

Heifer Development

A Guide to Biosecurity in Heifer Development

Biosecurity, the actions taken to prevent transmission of disease causing agents, is often overlooked in many herds and heifer-rearing operations. Biosecurity becomes increasingly important with trends for beef and dairy operators to introduce cattle that are not home-raised and to rely on commercial heifer developers to raise replacement cattle. Beef and dairy farmers have concerns that custom-raised heifers could present health risks to their operations. Similarly, heifer growers should be concerned that calves arriving at their farms may spread disease to other heifers in their operation, or will later pose health risks to the herds they enter. Heifer developers can manage biosecurity risks so that they raise heifers and maintain cattle herds that are less likely to become exposed to, or transmit, disease.

The following examples illustrate how biosecurity management might prevent the transmission of these specific diseases. These are generalizations; you should develop your biosecurity management plans with your veterinarian.

BOVINE VIRUS DIARRHEA (BVD)

Risk Assessment – Acute infection with bovine virus diarrhea virus (BVDV) damages the immune system and causes reproductive losses. An important source of BVDV to many herds is the introduction of animals that were exposed to the virus as a fetus and born persistently infected (PI). Cattle that are PI with BVDV may appear healthy but expose herdmates, through continual shedding, to the virus. A single PI animal can expose many animals in a herd under the intensive management of typical dairies and heifer–grower businesses. The greatest risk for losses due to acute infection and creation of new PI fetuses is by exposing pregnant cattle to BVDV.

Biosecurity Management

Remove reservoirs – A hope for controlling BVDV transmission lies in removing all PI calves before they can expose breeding age heifers to the virus. PI calves can be accurately identified by staining a skin tissue sample for the virus (ear–notch test).

Improve host immunity – Vaccines administered after maternal antibodies have waned (usually by 3–4 months of age) may reduce disease due to acute BVDV infection, but may not prevent all fetal infections.

Reduce effective contacts – Segregation of pregnant and breeding stage cattle from other age groups may help prevent fetal infections unless a PI animal is already among those animals.

NEONATAL CALF DISEASES

Risk Assessment – In their early life almost all calves are exposed to the common agents that cause scours and pneumonia (*e.g.* rotavirus, coronavirus, cryptosporidia, *Escherichia coli*, *Pasteurella* spp.). Some farms have severe outbreaks of illness and death in young calves due to these agents and others rarely see a case. The difference is largely due to biosecurity management.

Biosecurity Management

Remove reservoirs – Not a likely strategy! The agents of these diseases are everywhere. Reservoirs of infection are other calves and the environment. A biosecurity plan for neonatal calf illnesses must rely on increasing host resistance to disease and minimizing effective contact with older calves and a contaminated environment.

Improve host immunity – Absorption of antibodies from colostrum is the most important factor to increase host resistance, but may not be in the heifer grower's control. Antibody absorption can be measured to evaluate the immune status of incoming calves. Calf providers that reliably supplement colostrum should be rewarded.

Reduce effective contacts – Neonatal calves should be isolated from direct and indirect contact with other calves. Feeding equipment must be effectively sanitized between uses, and pens must be cleaned before the next calf enters. Workers should move from youngest to oldest animals. Provide enough air movement to remove pathogen's from the calf's airspace. Flies may transmit these agents and insect control is important.

BOVINE LEUKOSIS

Risk Assesment– Many cattle in the United States are infected with bovine leukosis virus (BLV). However, few of the cattle infected with BLV ever exhibit clinical signs. Unfortunately, a positive test often prevents the sale or movement of cattle because of regulatory or condition–of–sale requirements. The virus is transmitted to other cattle through the transfer of virus–infected white blood cells. The virus may be transmitted to other cattle through contaminated injection needles; dehorning, tattooing, or surgical instruments; or other methods that may transfer blood cells between animals.

Biosecurity Management

Remove reservoirs – The heifer grower cannot prevent the introduction of BLV infected calves unless the calves come from herds that have demonstrated that they do not have positive testing adult cattle. Milk from infected animals is a potential reservoir: feed colostrum from dam to calf and use milk replacers.

Improve host immunity – No vaccine against BLV is available.

Reduce effective contacts –The transfer of white blood cells between animals can be prevented by using syringe needles and palpation sleeves on only one animal, practicing non–bloody dehorning methods, and sterilizing tattoo and surgical instruments between animals. Whether or not biting insects transmit bovine leukosis is controversial, but insect control seems prudent.

JOHNE'S DISEASE

Risk Assessment – Cattle with Johne's disease exhibit chronic, incurable diarrhea and weight loss. Infection with the agent *Mycobacterium paratuberculosis* occurs in young calves, but infected cattle do not become ill until years later. Diagnostic tests for *M. paratuberculosis* infection are not informative for screening individuals, but there are reliable testing strategies to determine the infection status of herds. The agent may survive in manure, water, or soil for many months.

Biosecurity Management

Remove reservoirs – There is no way to know if calves entering a farm are infected with *M. paratuberculosis* unless they arrive directly from an infected herd. It is possible to accurately identify dairies unlikely to be infected. Many states are now considering how to implement such a plan.

Improve host immunity – You cannot reliably immunize calves against *Johne's Disease*. In some states a vaccine against *M. paratuberculosis* is available for use in calves less than 35 days of age; however, the vaccine will not prevent infection and its use is controversial and not widely recommended.

Reduce effective contacts – Because they are able to segregate heifers from exposure to the manure of infected adult cattle, some heifer-growers can supply a lower percentage of *M. paratuberculosis* infected heifers than some dairy farmers raise. This can be achieved if most calves arrive at the heifer-grower operation uninfected (early segregation from exposure sources) and effective contacts are prevented during heifer rearing. Effective contacts are reduced by segregating heifers less than 6 months of age from older animals, preventing fecal-oral contact of calves with milk or manure from older animals, and segregating young calves from surface water or pasture where older cattle have been.

Summary

The biosecurity principles are simple and few, but how they are applied is the difference between success and failure. Clinical evidence of Johne's disease is rare in heifers, yet the heifer grower phase may be the best time to prevent new infections. Ironically, bovine leukosis is spread most easily in herds that are the most intensively managed. Every single "needle–in–a–haystack" PI reservoir must be eliminated to control BVDV transmission, yet to control calf scours and pneumonia we strive to see that every calf is exposed to a smaller dose of pathogens.

If farmers are concerned about disease transmission in their herds, then biosecurity management can pay dividends. Effective biosecurity management requires an assessment of what diseases are of concern, what the effective control points are, and knowledge that the resulting increase in heifer value outweighs the costs. For many heifer grower operations biosecurity remains a management niche yet to be filled.

Herd Biosecurity Plan

Veterinarian:_____

Disease Concerns _____

Risk Factors _____

Management Actions _____

Monitoring Results _____

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