



Biosecurity in the Feedlot

Biosecurity practices in western Canadian cow-calf herds and their association with animal health

[Trent R. Wennekamp](#)⁰¹, [Cheryl L. Waldner](#), [Sarah Parker](#), [M. Claire Windeyer](#), [Kathy Larson](#), and [John R. Campbell](#)

[▶ Author information](#) [▶ Copyright and License information](#) [PMC Disclaimer](#)

Abstract

[Go to: ▶](#)

Biosecurity practices of beef cow-calf herds in western Canada have not been studied extensively nor is there a good understanding of their association with herd health. A survey was sent to 103 cow-calf producers of the Western Canadian Cow-Calf Surveillance Network. Eighty completed questionnaires were returned. Bulls were purchased for all herds during the 2014 to 2017 study period; 54% of herds purchased heifers and 42% purchased cows. The use of standard biosecurity practices was generally low with 30% of producers keeping purchased animals separate and 30% vaccinating new additions. None of the evaluated biosecurity practices were associated with reporting Johne's disease. The purchase of > 10 bulls, the purchase of cows, not vaccinating animals bought into the herd, and use of community pasture were associated with a bovine respiratory disease outbreak. Outbreaks of calf diarrhea were associated with the purchase of 10 or more bulls, the use of a community pasture, and leasing or sharing bulls.

Trent Wennekamp DVM MSc.



Biosecurity practices in western Canadian cow-calf herds and their association with animal health

[Trent R. Wennkamp](#),^{ORCID} [Cheryl L. Waldner](#), [Sarah Parker](#), [M. Claire Windeyer](#), [Kathy Larson](#), and [John R. Campbell](#)

[▶ Author information](#) [▶ Copyright and License information](#) [PMC Disclaimer](#)

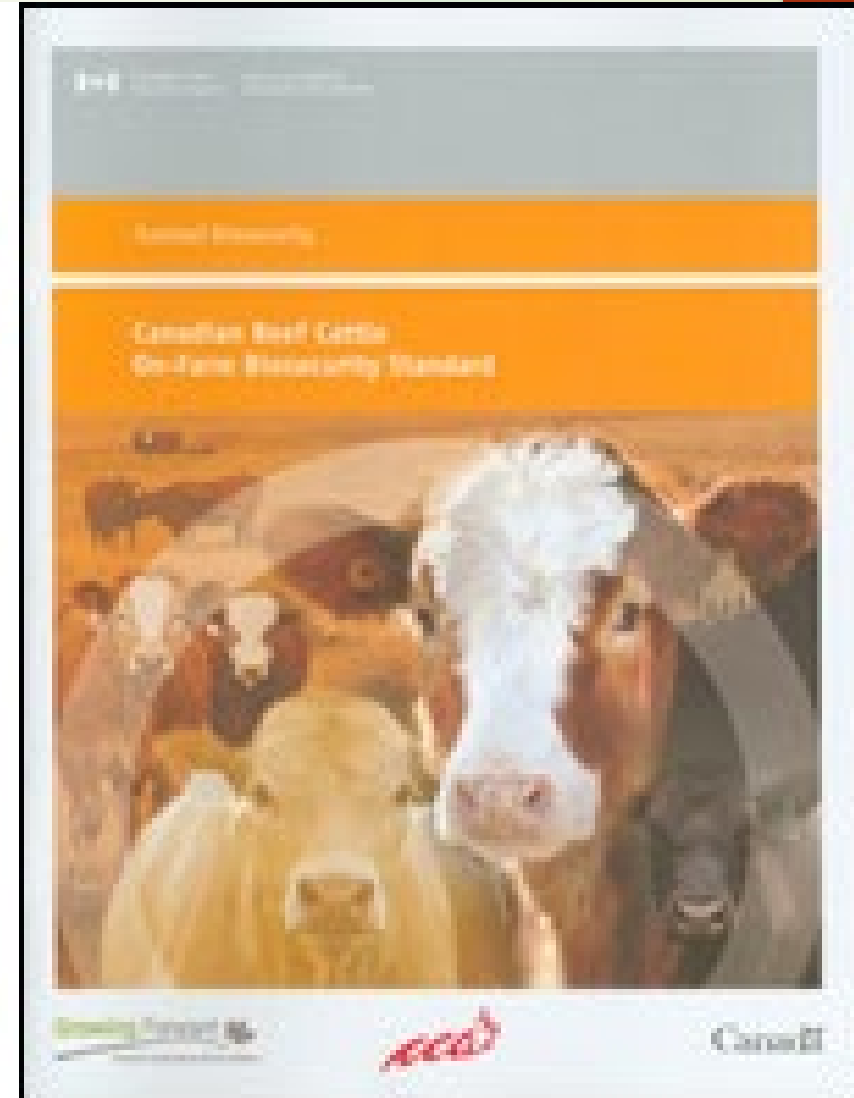
1. Biosecurity practices were generally not practiced – Less than one third of producers segregated new additions or vaccinated on arrival.
2. Found that calf diarrhea and bovine respiratory outbreaks were associated with purchase of animals – bulls were a culprit – as well as the use of community pasture.



What is Biosecurity?

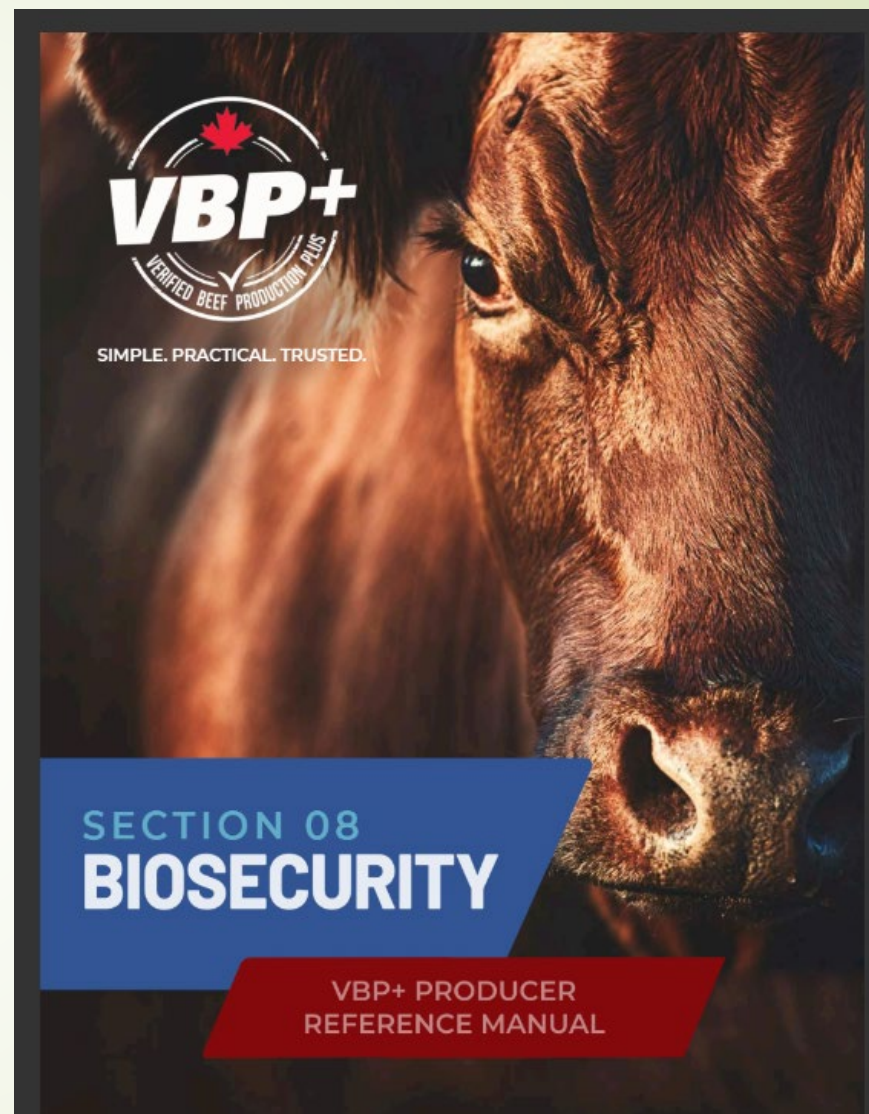
Biosecurity (definition): those practices that prevent disease from entering, spreading within, or being released from livestock operations.

Disease (definition): a broadly applied term encompassing a range of pests, pathogens and other disease-causing agents, including toxins.



Verified Beef Production Plus

VBP+ STANDARD	
ASSESSMENT SCORING	0 Lack of awareness or understanding of the importance of biosecurity protocols for quarantine or comingling of cattle.
	1 Awareness of the importance of biosecurity protocols for quarantine or comingling of cattle, some implementation, working at additional initiatives.
	2 Able to articulate policies and procedures around quarantine or comingling cattle to reduce spread of disease to the home livestock, has used the Veterinarian for input
	3 Operation has implemented and adopted policies and procedures to reduce spread of disease to the home livestock, has used the Veterinarian for input, written protocols and records to show implementation



slido

Please download and install the Slido app on all computers you use



Is your operation Verified Beef Production Plus certified?

① Start presenting to display the poll results on this slide.

Best Practices for Beef Cattle Quarantine

Beef Cattle Research Council

Segregate



- Separate from all other animals
- Separate water sources
- Move equipment from clean animals first to quarantined animals last

Time



- Consult your veterinarian for recommended quarantine times

Monitor



- Watch for any signs of illness in the herd

Vaccinate



- Get new animals on the same vaccine schedule as the main herd
- Allow enough time for the vaccines to become protective before turning out with other animals

Test for Disease



- Test for any diseases that may not present with clinical signs

Treat

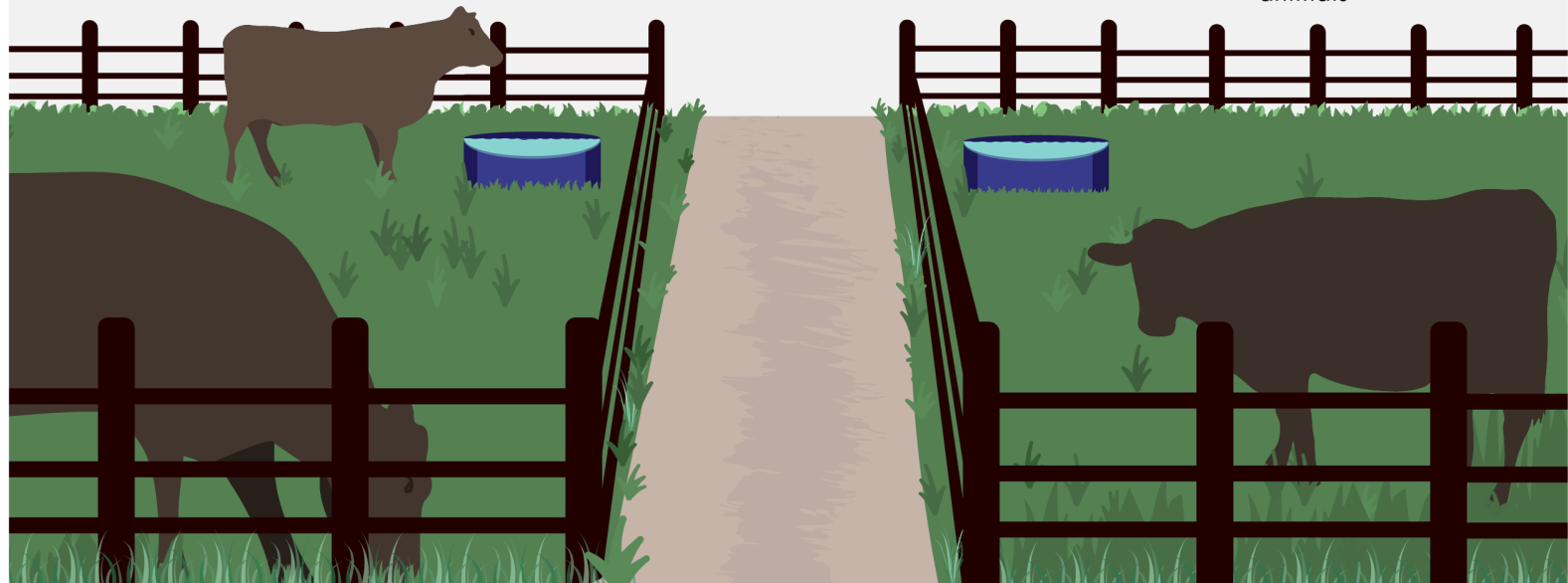


- Treat any illness in the herd as it occurs

Record



- Share records with previous owners of incoming animals
- Share records with new owners of sold animals
- Keep records of vaccination, health status, and treatment plans for quarantined animals



BEEFRESEARCH.CA/PREVENT



LLOYDMINSTER
ANIMAL HOSPITAL

slido

Please download and install the Slido app on all computers you use



How would I score on the Verified Beef Production Audit on Biosecurity?

① Start presenting to display the poll results on this slide.



Biosecurity in other species.

Biosecurity in
other species.

MINIMAL DISEASE
HOG OPERATION
NO ADMITTANCE

CARGILL LIMITED

WELCOME
TO
HOG HEAVEN



Diseases of concern in other areas of animal agriculture.

Pigs:

- Porcine epidemic diarrhea (PED) 2014: A highly contagious viral disease that causes diarrhea and vomiting in pigs. Can be very serious and can kill younger pigs
- African Swine Fever (ASF): a contagious viral disease of wild and domestic pigs. ASF kills almost 100 percent of the animals it infects.

Chickens:

- **Avian influenza:** A viral infection that can affect poultry and other birds. Highly pathogenic avian influenza (HPAI) A(H5N1) is a subtype of this virus that can kill poultry and wild birds.

Dairy Cattle:

- Highly pathogenic avian influenza (HPAI) in cattle: HPAI has not been detected in dairy cattle or other cattle in Canada and is a reportable disease under the Health of Animals Act.

Biosecurity in Beef Cattle in Canada



- ▶ As of January 2020, there were 72 700 operations with cows and calves in Canada, with the majority concentrated in western Canada.
- ▶ Production in these operations is funneled into a small number of feedlots; in Alberta and Saskatchewan there are 165 feedlots with average annual capacity of 1000 head or higher, and together, they have a one-time capacity of 1.59 million head of cattle.
- ▶ This “funneling” results in extensive mixing of cattle from various farms as animals are sold through auction markets.

Four Pillars to Biosecurity: Manage and Minimize Animal Movement Risks

1. Manage & minimize animal movement risks

- 1A. Manage Commingling:
 - 1A.1. Segregate and, when warranted, vaccinate, test, and otherwise treat, incoming animals.
 - 1A.2. Obtain and share information about commingled animals with previous and future owners.
 - 1A.3. Minimize contact with animals of other species and from other operations to the extent possible.
- 1B. Manage movements of high-risk and highly susceptible animals:
 - 1B.1. Manage and minimize movements of, and contacts with, high-risk and highly susceptible animals.
 - 1B.2. Use or request clean trucks for movement of highly susceptible animals.

slido

Please download and install the Slido app on all computers you use



On my operation, to the best of my ability, I:

① Start presenting to display the poll results on this slide.

Four Pillars to Biosecurity: Manage the Movement of People, Vehicles, Equipment and Tools

2. Manage The Movement Of People, Vehicles, Equipment, and Tools

- 2.1. Apply sanitation practices that are relevant to personnel, visitors, vehicles, equipment, and tools on entry to, within, and on exit from production areas.
- 2.2. Minimize the use of the same equipment for both "clean" and "dirty" tasks.
- 2.3. Ensure production area perimeters are sufficient to contain livestock, with access points that can be closed to prevent access by people, other than deliberate non-compliance.
- 2.4. Post biosecurity signs at access points to production area and farmyard.
- 2.5. Manage and dispose of deadstock and manure to minimize contact with live animals.
- 2.6. Minimize pests to reduce exposure to livestock to the extent practical.
- 2.7. Manage livestock to reduce exposure to wildlife to the extent practical.
- 2.8. Ensure facilities are maintained and clean.



slido

Please download and install the Slido app on all computers you use



On my operation to the best of my ability, I:

① Start presenting to display the poll results on this slide.

Four Pillars to Biosecurity: Manage Animal Health Practices

3. Manage Animal Health Practices

- ▶ 3.1. Establish and maintain a working relationship with a veterinarian.
- ▶ 3.2. Manage herd health according to a documented Herd Health Plan (HHP), prepared in consultation with a veterinarian.
- ▶ 3.3. Obtain water, feed, medications, and other inputs from safe and reliable sources, and manage or store these resources to ensure their ongoing safety and efficacy.



slido

Please download and install the Slido app on all computers you use



On my operation to the best of my ability, I:

① Start presenting to display the poll results on this slide.

Four Pillars to Biosecurity: Educate, Plan, Record

4. Educate, Plan, Record

- ▶ 4.1. Ensure that personnel understand how and why biosecurity is applied on their operation.
- ▶ 4.2. Develop, document, and maintain a biosecurity plan that is specific to the needs of the operation.
- ▶ 4.3. Ensure that personnel know how to respond to the range of animal health situations typical to the operation.
- ▶ 4.4. Ensure that personnel know how to respond to an unusual animal health situation.
- ▶ 4.5. Maintain ongoing records for animal health management.

slido

Please download and install the Slido app on all computers you use



On my operation to the best of my ability, I:


① Start presenting to display the poll results on this slide.

Why Does Biosecurity Matter?

Why are biosecurity standards important?

- ▶ improve the health of individual animals.
- ▶ lower the cost of cattle production.
- ▶ avoid the devastating impact and loss of international markets that would result from an outbreak of a reportable foreign animal disease, such as Foot and Mouth Disease (FMD)
- ▶ While reportable foreign animal disease outbreaks in Canadian cattle are rare, the impacts are readily apparent to beef cattle producers, as evidenced following the identification of Bovine Spongiform Encephalopathy (BSE) in Canada.
- ▶ Canada's beef cattle industry relies upon trade and would be devastated if a highly contagious and infectious disease like FMD were to occur. The impact to the industry and the economy would result in multi-billion dollar losses.





Who Remembers May 20, 2003?

May 20, 2003: Canadian Food Inspection Agency announces a black Angus cow from northern Alberta has been found to have bovine spongiform encephalopathy. United States immediately closes its border to Canadian beef and cattle. About 40 countries follow suit.

Nov. 29, 2004: Report from BMO's economics department says Canadian cattle producers have lost about \$5 billion since the crisis began.

March 2, 2005: U.S. judge slams shut the door to live Canadian cattle and expanded beef imports, granting R-CALF's request to postpone reopening the border.

March 3, 2005: U.S. senators voice fierce resistance to resuming cattle trade with Canada. Vote 52-46 to reject U.S. Agriculture Department's plan to start importing Canadian cattle.

What would an outbreak look like in 2025?

- Late January-Early February:
Mystery disease in the Texas Panhandle region
Dairy cattle affected
- No death loss but ~10-15% of cattle getting sick over the course of 7-10 days
- Early March: Additional dairy farms affected (~10-15 sites) with similar clinical signs

What would an outbreak look like in 2025?

Findings common to all affected sites

- Severe abrupt drop in feed intake, milk production
- Mostly older, mid-late lactation cows
- Thick yellow milk (similar to colostrum) in a portion of cows
- Decreased rumination
- Abrupt spike in clinically ill cattle
- ~15% of herd over 10-day period

What would an outbreak look like in 2025?

- Lab submissions:
- PCR negative for common viral/bacterial pathogens
- No significant bacterial growth from milk or feces
- No consistent abnormalities on CBC/serum chem/UA
- Trace mineral/heavy metal screening - Unremarkable

- March 17-18: Neurologic disease in cats at multiple dairy farms
- Known exposure to/consumption of hospital milk

slido

Please download and install the Slido app on all computers you use



The disease being described in the previous slides is:

① Start presenting to display the poll results on this slide.

What would
an outbreak
look like in
2025?

Labs started looking for Influenza A Virus – Strongly positive.
Determined that it was Highly Pathogenic Influenza A Virus.
Very high morbidity and low to zero mortality.

What would an outbreak look like in 2025?

How did it spread so quickly?

- Shared workers

 - Workers employed at multiple dairies

- Several dairy workers shared housing with poultry workers
- Several dairy workers also worked at poultry sites
- Virus detected in cats, raccoons, opossums, small birds
- Did not find virus in migratory waterflow



Reportable Diseases of Concern

- ▶ **'Endemic' diseases:** these are already present in the industry and may occur on an ongoing basis. Producers may be familiar with many of these, and already have encountered them. Examples include:
 - ▶ Infectious bovine rhinotracheitis (IBR)
 - ▶ Eradication program in effect in some European countries.
 - ▶ Bovine viral diarrhoea (BVD)
 - ▶ Eradication program in effect in some European countries.
 - ▶ *Mycobacterium avium paratuberculosis* (Johne's Disease)
 - ▶ *Neospora caninum* (Neospora)
 - ▶ Mycoplasma
 - ▶ Eradication program in effect in New Zealand



Reportable Diseases of Concern

- ▶ **'Reportable' diseases:** these are of significant importance to human or animal health, or to the Canadian economy. Not generally present in the industry, these have rarely if ever occurred in the Canadian industry and are sometimes referred to as 'foreign animal diseases' or 'emerging diseases' in the case of the newer ones. Examples include:
 - ▶ Bluetongue virus (Bluetongue)
 - ▶ *Mycobacterium bovis* (Bovine Tuberculosis or TB)
 - ▶ *Brucella abortus* (Brucellosis or Bangs)
 - ▶ Bovine Spongiform Encephalopathy (BSE or Mad Cow Disease)
 - ▶ Foot and Mouth Disease (FMD)
- ▶ **Zoonoses:** these are diseases that can be transmitted from animals to humans. They may be endemic or reportable, and include diseases such as TB, Brucellosis, Rabies, and Ringworm, all of which can be found in cattle.



Foot and Mouth Disease

- ▶ Foot and mouth disease (FMD) is a severe, highly contagious viral disease of cattle, swine and sheep and other cloven-hoofed animals such as goats, deer and bison. Horses are not affected.
- ▶ Human cases are extremely rare, generally mild and most often associated with consuming infected milk or having direct contact with FMD blisters.
- ▶ **Clinical signs of Foot and Mouth Disease:**
 - ▶ depression
 - ▶ fever
 - ▶ blister-like sores on the tongue and lips, in the mouth, on the teats and between the hooves
 - ▶ foot lesions, accompanied by acute lameness and reluctance to move; and
 - ▶ Many affected animals recover, but the disease leaves them weakened and debilitated.



Foot and Mouth Disease

- The disease is currently present in many areas of the world such as Africa, Asia, the Middle East and parts of South America (mostly Venezuela).
- Canada, the U.S., Mexico, Central America, Australia, New Zealand, Chile, and several other countries are considered free of FMD.
- **The transmission and spread of FMD**
 - FMD is one of the most contagious animal diseases. An outbreak can spread by direct, indirect and airborne transmission.
 - Indirect transmission occurs when susceptible animals:
 - have contact with people wearing clothes, footwear or equipment contaminated with the virus
 - are given feed or water contaminated with FMD virus
 - Airborne transmission occurs when infected animals exhale large amounts the virus into the air. The virus can spread by air over long distances.



Foot and Mouth Disease

- In 1951, the world was recovering from the Second World War.
- Willi Bruntjen, a 29-year-old farm worker, left his homeland of Germany on October 15 and came to Canada seeking a new life. He wore his only clothes, a brown suit, and carried a package of food for the trip, which included a link of sausage.
- He obtained work in Saskatchewan at the farm of Leonard Waas outside of McLean on November 2. Waas owned a small operation of 38 cows and a few pigs and horses.



Foot and Mouth Disease

- Bruntien stayed just two days because he soon got work at a larger operation. Before leaving Waas's farm, Bruntien found a dried piece of his sausage in his pocket and tossed it into the pig trough.
- On November 22, Waas sold some calves to a Regina packing plant. While visiting the plant, he walked through the feedlot as he often did before returning home.
- By late November, Waas noticed an illness among his animals and understandably, talked to his neighbors about it, and visited them.



Foot and Mouth Disease

- In the meantime, Bruntjen moved to a large dairy farm, wearing the same suit and boots he wore when he left Germany.
- By mid-January 1952, cattle on that dairy farm became sick. The owner phoned the veterinarian, who was in bed with a cold and made the diagnosis over the phone. He thought the sores were vesicular stomatitis, a mild condition treated topically.
- Almost a month later, on February 12, a vet examining the cattle wondered if the illness could be foot and mouth disease. FMD had never been in Canada so it was a long shot. He took samples for testing. On February 25 the tests confirmed positive for FMD.
- “The year Bruntjen came to Canada, foot-and-mouth disease was pandemic across Europe,” Frank Jacobs wrote in a Cattlemen magazine article.



Foot and Mouth Disease

- The disease was brought under control by May 3, but the 42 farms that had been in contact with the virus remained under quarantine until mid-August. Canada was declared disease-free by mid-August 1952.
- In all, 42 properties had been in contact with the virus and 29 were infected. To stop the spread, 1,313 cattle, 294 pigs, 97 sheep, 2,372 fowl, and 15,828 eggs were destroyed.



So, what
should
feedlots be
doing...?

Following the guidelines laid out in Verified Beef Production Plus is a good start.

How can you tell if it's just a typical disease situation vs. An unusual or even potential foreign animal disease situation?

An Unusual Disease Situation may look like:

1. A new disease not previously encountered – unusual lameness, neurological disease, difficulty eating, etc.
2. Looks like a common disease but sickness or death loss is higher than usual.
3. Looks like a common disease but animals are not responding to treatment.
4. Records reveal higher than usual sickness or death loss over a given time period.



So, what
should
feedlots be
doing...?

Having a good plan in place BEFORE an outbreak occurs makes the response quicker and more effective.

1. Recognize the unusual disease situation.
 - Good records are your best tool for this.
2. Contact your herd veterinarian immediately.
3. Notify staff that an unusual disease situation exists.
4. Limit all animal movement on and off the farm.
 - Delay shipping and receiving of cattle until the unusual disease situation can be resolved.
 - If this is not possible – segregate new arrivals from cattle already on the feedlot. Notify the feedlot or packing plant that is receiving the cattle that an unusual disease situation exists.



So, what
should
feedlots be
doing...?

5. Limit movement of people on and off the farm.
 - Limiting access to your farm of visitors from foreign countries is a good idea. If necessary – good hygiene is essential.
 - Visitors should always be instructed to stop at the office first. Provide dedicated clothing and footwear.



So, what should feedlots be doing...?

- ▶ Limit exposure of cattle to other species. Diseases that can be transmitted to cattle from other species:
- ▶ Malignant Catarrhal Fever from Sheep and Goats to Cattle.
- ▶ Tuberculosis from Deer or Elk.
- ▶ Brucellosis from Deer or Elk.
- ▶ Rabies from Skunks, Coyotes or Wolves.
- ▶ Neospora from Dogs, Coyotes or Wolves.

A dark, atmospheric photograph of a snowy landscape at dusk or dawn. The sky is a deep, dark blue, with a thin crescent moon visible in the upper right quadrant. The horizon is a dark line, with a faint orange glow from the setting or rising sun. In the foreground, there is a snow-covered field with a wooden fence line. To the left, there are several bare, dark trees. The overall mood is quiet and contemplative.

Questions?