Canadian Food Inspection Agency
Agence canadienne d'inspection des aliments

Animal Biosecurity

Canadian Beef Cattle On-Farm Biosecurity Standard



Growing Forward
A federal-provincial-territorial initiative

Canada

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Executive Summary

Canada's beef cattle producers recognize the need for sound on-farm biosecurity practices to manage disease risks in order to protect the health of their herd and operation and, by extension, the national herd and the industry.

The Canadian Beef Cattle On-Farm Biosecurity Standard provides practical and effective on farm biosecurity practices which can reduce the risk of disease, when properly applied and followed, and which are of a low cost to the producer to implement. Developed over two years, in consultation with beef cattle producers, industry and government, the Standard is designed specifically for the Canadian beef cattle industry and is applicable to farm-level operations of all types and sizes. Its focus is on practices and procedures that reduce the risk and impact of disease in cattle operations.

The Standard is built on four basic principles of on-farm risk reduction:

1. **managing and minimizing animal movement risks;**
2. **managing the movement of people, vehicles, equipment and tools;**
3. **managing animal health practices; and**
4. **the biosecurity knowledge and training of personnel on the operation's biosecurity plan.**

Each principle has target outcomes that can be achieved in a variety of ways through the Biosecurity Implementation Manual.

The general practices and guidelines of the Standard are voluntary. Adherence to the principles set forth in this Standard can control and reduce the risk and impacts of endemic diseases and of an emerging disease or foreign animal disease (FAD) in the Canadian herd. Managing risk is something beef cattle producers do every day. The Standard is a tool that provides broad guidelines for disease risk management that are practical and science-based, and specific to the beef cattle industry.



Biosecurity, a National Standard and Canada's Beef Cattle Industry

Biosecurity

Biosecurity Is...

> *Those practices that prevent or mitigate disease from entering, spreading within or being released from[1] operations that may contain livestock.*

There are many definitions for biosecurity, several of which were considered in developing this Standard. The context of these definitions varies significantly. Some have application to the country as a whole, while others have an industry-wide application. The definition above has application to the on-farm context for which this Standard is intended, and was readily understood in consultations with producers.

A similarly broad definition of disease is also used throughout:

> *The introduction, transmission, spread, and/or existence of a range of pests, pathogens and other disease causing agents, including toxins. The emphasis of this Standard is upon infectious disease.*

The relatively general nature of the definitions for biosecurity (the practices) and disease (the risk being managed) has led to a Standard based upon principles or guidelines and target outcomes that has broad farm-level application.

Biosecurity and Risk Management

Biosecurity is a form of risk management. The risk in this case is disease and its potential impact on a specific herd or the industry at large. The Standard comprises the management practices used to manage that risk.

The Standard sets out the general guidelines and practices by which producers can manage disease risks in Canada's beef cattle industry. The guidelines and practices were developed collaboratively by industry and government, considering the different types and sizes of operations across the country. In this context, biosecurity is the management of disease risks or disease risk management.

1 Jordan L. Points of View, January 2010, Volume 4, Issue 1. Canadian Sheep Federation.

Biosecurity and Its Importance to Individual Producers and to Canada's Beef Cattle Industry

Biosecurity is an important tool that producers can and do use to manage disease in the Canadian beef cattle industry. Diseases such as infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (BVD), *Mycobacterium avium paratuberculosis* (Johne's disease) and neonatal calf diarrhea (scours) are all too familiar to producers throughout the industry and, in many cases, are endemic throughout most of North America. Although these diseases may be eradicated from a particular herd, there is an ongoing risk of re-occurrence that can be managed through biosecurity.

These diseases, along with others, come at a cost to producers, whether measured in terms of dollars and cents, lowered productivity, or animals lost. It is estimated that respiratory disease accounts for 16% of calf loss.[2] Other estimates suggest that the diarrhea in neonatal calves results in 5% of all calf losses – a figure that increases to 25% when older calves are included.[3] When multiplying these losses and their related costs across the more than 80,000 operations that raise beef cattle in Canada, it is clear that reducing the impacts of such diseases may result in significant savings to the industry as a whole.

The same principles that enable producers to better manage the risks of endemic disease within their operations may have a cumulative effect if applied across the industry, and thus facilitate the reduction of diseases that are considered endemic.

Applied across the industry, these principles will also reduce the risk of an emerging disease or a foreign animal disease (FAD), namely, foot-and-mouth disease (FMD). An outbreak, particularly one such as FMD, could have devastating impacts on individual operations and on the industry as a whole. It is estimated that the economic impacts of an FMD outbreak in Canada could be reduced from $48 billion to $23 billion, and possibly to $6.6 billion, by the presence of moderately effective, or even highly effective, policies that address zoning, identification and traceability, and biosecurity.[4]

Although the severity and impact of endemic, emerging, and FAD outbreaks may differ, they are all caused by diseases which themselves are caused by organisms. Managing the outbreak, therefore, requires management of the organism. Just as these principles can control and reduce the impacts of endemic diseases, so, too, can they control and reduce the impacts of a FAD or an emerging disease.

2 Callan R, Garry F. Biosecurity and bovine respiratory disease. *Veterinary Clinics of North America: Food Animal Practice* 2002;18:57-77.

3 Barrington G, Gay J, Evermann J. Biosecurity for neonatal gastrointestinal diseases. *Veterinary Clinics of North America: Food Animal Practice* 2002;18:7-34.

4 Potential Economic Impacts of a Foot and Mouth Disease Outbreak. Serecon Management Consultants; 2010.



A National Standard

Who Is This Standard For?

This Standard is for producers and for those who own, manage, or work with beef cattle in Canada.

It is designed for on-farm application in farm-level operations of all types and sizes, and from all regions across Canada. Awareness of the Standard enables individuals within other types of operations in the beef cattle industry to conduct their business in a manner that supports the beef industry's interests in reducing disease.

What Is This Standard For?

This Standard will assist producers and others in the on-farm application of biosecurity on operations of various types and sizes and in all regions of Canada's beef cattle industry. The Standard sets out guidelines through the four basic principles of biosecurity for Canada's beef cattle industry and the target outcomes by which each may be achieved. Applying the principles and achieving the target outcomes of the Standard is intended to reduce the prevalence of existing and endemic diseases in a cost-effective manner and, in doing so, prevent the introduction of new and possible FADs in beef cattle operations across Canada.

The Standard will also be available for consideration by trade and industry officials in other countries seeking to evaluate biosecurity in Canada. In this context, it will be considered together with the range of other biosecurity tools used or being developed in Canada (e.g. border controls, surveillance, and disease control actions), as well as standards for other Canadian commodities, such as poultry, swine, dairy, grains, oilseeds, and potatoes.

How Was the Standard Developed?

The Standard was developed with the help and support of producers, subject matter experts, advisory groups, and leaders in industry and government.

A number of tools and techniques were used during the Standard's development. Listed in greater detail in Schedule 2, these include the following:

- review of cost-benefit considerations of various biosecurity practices and protocols;

- gap analysis relative to existing programming;
- literature review and identification of cited biosecurity practices;
- consultation of producers' current biosecurity practices in Canada's beef industry, using a representative sample of the population of producers in Canada; and
- consultation on a draft Standard, with a cross-section of stakeholder representatives and others engaged in the beef cattle industry.

Format of the Standard for Canada's Beef Cattle Industry

The Standard consists of four principles, in turn supported by a total of 21 target outcomes. These are outcome-based guidelines, and thus indicate the objective or goal, while enabling producers to reach it by using the means most suited to the operation.

Each principle is supported by several paragraphs that indicate the following:

- **What** is meant or implied by the principle.
- **Why** the principle is important. A brief explanation is provided, indicating why this particular principle is important to producers and/or the industry at large.
- **Target outcomes** that describe how the principle may be maintained, each of which is supported by additional information.

What This Standard Is... and What It Is Not

The Standard Is	The Standard Is Not
Voluntary	Mandatory
Broad, risk management guidelines, addressing disease in the broad context, warranting thought and consideration in most beef operations across Canada	A list of "must dos," designed for a specific disease, to be achieved regardless of regional and operational differences
Based upon principles, each of which can be achieved in a variety of ways	A prescriptive set of practices
Specific to beef cattle and biosecurity practices current to the Canadian industry	Taken from one sector or another country, and re-designed for this application
Practical and science-based, developed with consideration for disease transmission across the range of beef cattle production systems	Idealistic, developed without consideration for the feasibility of implementation
Cost-effective, focusing upon practices and procedures that have an impact on disease	Costly in terms of new equipment or infrastructure or requiring significantly different ways of doing business

Supporting Information for Producers Who Are Implementing the Standard

A brief Overview is provided within the Standard.

A Biosecurity Implementation Manual that is specific to the Standard and to the beef cattle industry will be available as a separate document. The Biosecurity Implementation Manual sets out additional information on how to apply the principles and target outcomes of the Standard, the additional benefits of applying the Standard, and where to find additional information.



Overview

The Canadian Beef Cattle On-Farm Biosecurity Standard comprises four principles:

Principle 1: Manage and Minimize Animal Movement Risks

1.1 Commingling
- 1.1.1 Segregate and, when warranted, vaccinate, test, and otherwise treat, incoming animals
- 1.1.2 Obtain and share information about commingled animals with previous and future owners
- 1.1.3 Minimize contact with animals of other species and from other operations to the extent possible

1.2 Manage movements of high-risk and highly susceptible animals
- 1.2.1 Manage and minimize movements of, and contacts with, high-risk and highly susceptible animals
- 1.2.2 Use or request clean trucks for movement of highly susceptible animals

Principle 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

Principle 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

Principle 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



Manage and Minimize Animal Movement Risks

1.1 Manage Commingling

What is commingling? Commingling occurs when cattle from one operation mix or come into contact with cattle from another operation. This can take place when animals are put on Crown range or in community pastures, are acquired at auction or are "shown."

These forms of commingling are quite common in Canada's beef cattle industry, and most producers are familiar with them.

Why is commingling an important biosecurity risk? Commingling represents a significant disease risk for a number of reasons:

- When animals from different operations are mixed together, cattle may be exposed to diseases present in other animals.
- Often, there is little awareness or control of the management practices applied to animals from the other operations.
- The management practices and disease risks can vary significantly between the operations that are commingling cattle.
- The disease status of animals can be difficult to ascertain, as animals can be infected without showing signs of disease.

There is a real and significant opportunity for disease transmission from one group of cattle to another. In short, all efforts to manage disease on one operation can be jeopardized and quite possibly nullified when animals commingle.

Certain commingling practices are integral to many operations in Canada's beef cattle industry, and it is unrealistic to suggest that producers stop these practices or that it would be to their benefit. Producers, however, should recognize and manage the risks that accompany these practices.

For instance, commingling is integral to most feedlot operations, wherein a number of well-documented animal health practices have been developed and have evolved specifically to manage the resulting risks.

Commingling is also integral to many cow-calf operations, whether they be ranging or pasturing of cattle, auctions or shows, or other production channels. It is important for producers who use or are associated with these production channels to recognize the disease risks and to manage those risks by applying appropriate biosecurity practices. Such practices include discussing the disease and the vaccination, treatment, and history of animals that commingle.

Target outcomes to minimize the risk of commingling – The following outcomes are necessary to manage or minimize the disease risks associated with commingling.

1.1.1 Segregate and, When Warranted, Vaccinate, Test, and Otherwise Treat, Incoming Animals

Segregating incoming animals, or holding them separate from the main herd for a period of time, enables monitoring for the presence of disease and lessens the risk that any disease they might carry would be introduced into the herd.

Segregation also provides the opportunity to monitor the health status of the herd from which incoming animals were sourced. If disease occurs in the source herd during this period, employ additional biosecurity measures.

Several factors are critical to effective segregation:

- **separation** – the use of physical, spatial (distance), and/or procedural barriers to prevent direct or indirect contact between the new animals and the herd into which they are being introduced (e.g. barn walls, pens isolated from one another); dedicated equipment used only for segregated animals or cleaning, and in some cases, disinfecting equipment, particularly veterinary equipment, and tools that are used for segregated animals prior to use with other animals; controlling movement of personnel and farm traffic (e.g. treating healthy animals before segregated animals, or with different personnel);
- **monitoring** – regular observation of the incoming animals to determine whether it is necessary to address additional health risks before they are introduced to the herd (e.g. morning and evening pen checks); and
- **time** – observing a period long enough to ensure that the likely health risks will become known (e.g. two weeks is long enough for most common bovine diseases to become apparent if they are present).

Segregate incoming animals for two weeks, during which time they will be monitored twice daily while held in facilities where they have no direct or indirect contact with the herd to which they are being introduced. This time period also allows incoming animals to acclimate and become accustomed to their environment within the new operation.

Vaccinate incoming animals for disease risks that are relevant within the new herd and environment. Test and treat for those disease risks that are relevant to the herd and the environment from which they originated and to which they may have been exposed. Preferably, these actions would be taken prior to arrival, although they may also occur during segregation.

Segregate, vaccinate, test, and otherwise treat animals returning to the herd following a temporary removal for range, show, backgrounding, or other reasons prior to re-introduction into the herd.

1.1.2 Obtain and Share Information About Commingled Animals With Previous and Future Owners

Knowing the disease status and the animal health regime of commingled animals enables future owners or managers to identify any potential disease risks and to plan for and manage those risks.

Before animals are introduced to or removed from a commingling situation, producers may request the following information from other producers who are involved:

- What disease risks were the other animals exposed to?
- What vaccination or testing regime was applied?

If that information is not readily available, employ additional biosecurity measures (e.g. segregation) before animals are reintroduced into the herd. Alternatively, information may be provided which indicates disease risks exist that differ from those being managed. In either case, the producer who is aware of the disease risk before other animals are exposed can take the appropriate steps to manage it.

1.1.3 Minimize Contact With Animals of Other Species and From Other Operations to the Extent Possible

Animals of other species, whether from the same or a different operation, may present disease risks that are not being managed within the beef cattle herd in question. The same is true for cattle from other operations.

Further, a disease that is latent or not expressed in another species could be expressed with significant and negative impact in cattle.

Minimizing direct and indirect contact, where practical, with animals from another operation, or from other species, helps prevent the introduction of diseases that are not being managed on farm.

In those situations where it is impossible or impractical to avoid these types of interactions, producers can take steps to manage the risk (e.g. enhanced monitoring, vaccination).

1.2 Manage Movements of High-Risk and Highly Susceptible Animals

What are high-risk and highly susceptible animals? While many animal movements occur within the normal day-to-day operation of beef cattle operations across Canada, some of these involve animals that present a greater disease risk than others.

High-risk animals are of unknown or greater risk of transmitting disease, and include those that are as follows:

- of unknown health status (whether within the operation or outside the operation);
- new to the operation or having been away from the operation;
- other species that may contribute to disease risk; and
- sick or recently recovered.

Highly susceptible animals are at a relatively increased risk of infection, and include the following:

- calves and/or young stock;
- recently weaned calves;
- sick, stressed, or recently recovered animals; and
- animals lacking immunity or resistance.

Why are high-risk and highly susceptible animals an important biosecurity risk? The opportunity for introducing or spreading disease is greater with these animals for various reasons, two of which arise from their likelihood to do the following:

- introduce disease (a high-risk animal) to other animals, because they were as follows:
  - raised under a different health management program that may not address the disease risks within the herd or operation,
  - exposed to disease risks that are not addressed within the operation, or
  - raised in an unknown health management program; and
- acquire disease (a highly susceptible animal) because of an already compromised immune system that is compounded by the stress that accompanies most movements, and results in a significantly lowered resistance to disease.

Clearly, this does not suggest that all movements of these classes of animals can or should be eliminated. However, producers should be aware that movements of these particular animals might incur greater risk than movements of some other animals. Once producers recognize that risk, they may choose to manage or minimize it accordingly.

Target outcomes to manage high-risk and highly susceptible animals – The following outlines the actions required to manage or minimize disease risks of these high-risk and highly susceptible animal movements.

1.2.1 Manage and Minimize Movements of, and Contacts With, High-Risk and Highly Susceptible Animals

Fewer movements, and less contact with other animals, help reduce the likelihood that highly susceptible animals will contract disease. This is because their recovering or developing immune systems are not slowed by the additional stress that accompanies movements, or are not challenged by potential exposure to diseases that may be present in other animals.

Minimizing contacts with high-risk animals, which by definition have a greater likelihood of disease, reduces the likelihood of introducing disease to the herd.

1.2.2 Use or Request Clean Trucks for Movement of Highly Susceptible Animals

Diseases can be harboured in and transmitted by contaminated surfaces, particularly the organic material within and on livestock trucks.

Using clean trucks to transport highly susceptible animals can reduce the likelihood that these animals will be exposed to and contract disease. While clean trucks are desirable for transporting all animals, highly susceptible animals are at greatest risk of contracting disease due to compromised immune systems.

Clearly, there are circumstances in which clean trucks are unavailable in a timely or cost-effective manner. These may include subzero temperatures, distance to clean-out stations, seasonal demand, and other reasons. In such circumstances, producers who are aware of the resulting risk can take appropriate action, such as increasing monitoring after transport.



Manage the Movement of People, Vehicles, Equipment, and Tools

What is the risk to livestock from the movement of people, vehicles, equipment, and tools? People and vehicles, equipment, and veterinary or other tools are all capable of carrying disease into and within an operation. Thus, it is important to manage the risk.

In a biosecurity context, inanimate objects capable of carrying disease are referred to as fomites. These include vehicles, equipment, veterinary or other tools, and items such as clothing and shoes. The people who are capable of carrying disease include owners, staff and service personnel, and visitors. People, however, are not inanimate, and thus are not referred to as "fomites."

From a biosecurity or disease risk management perspective, certain movements require managing more than others. Primarily, these are movements involving entry to and within the production area, including the corrals, pens, barns, and pastures of an operation, and other areas where livestock are or may be kept. Movements involving entry to and within the farmyard are somewhat secondary in importance.

Why are the movements of people, vehicles, equipment, and tools near livestock an important biosecurity risk? Managing the movements of people, vehicles, equipment, and tools in the production area is important; people and objects can carry disease from one location to another and from animal to animal.

Target outcomes for the movement of people, vehicles, equipment and tools – The actions to manage or minimize disease risks associated with the movement of people, vehicles, equipment, and tools entering the production area are necessary to minimize disease, and in particular the spread of disease.

2.1 Apply Sanitation Practices That Are Relevant to Personnel, Visitors, Vehicles, Equipment, and Tools on Entry to, Within, and on Exit From, Livestock Production Areas

The movement of people, vehicles, equipment, and tools, and their contact with animals in the production area or the farmyard may facilitate the introduction, transmission, or spread of disease. Develop sanitation protocols to manage the disease risks posed by the following:

- the degree to which a person's clothing, footwear, skin, or objects is/are contaminated with a disease; and
- the area of the premises with which the person comes into contact, animals and the production area being of greater importance than other areas of the farmyard.

The production area where the cattle are, or where they may be, is the critical area in which to apply sanitation practices: at entry, within, and/or on exit. Likewise, the farmyard is important, as disease may be transferred from a person or a thing entering this area to personnel who will then transfer the disease to cattle in the production area. Accordingly, certain sanitation practices should be applied at the farmyard: at entry, within, and/or on exit.

These examples highlight the need for application of sanitation practices, as follows:

- Require, at a minimum, dedicated clothing and footwear at each site for producers who work off-farm with other livestock (at an auction or on a different livestock operation).
- Restrict temporary foreign workers (personnel) from accessing the production area for a period of time after their last contact with livestock and farm sites in another country. The length of time depends on the diseases present in the other country and the procedures applied to the accompanying equipment, clothing, and other items, in addition to the degree of animal contact in the foreign country and that expected in Canada, the biosecurity practices applied before leaving the foreign country and prior to visiting the farm site, etc. In addition, provide biosecurity education regarding disease risks and corresponding management practices on the operation.
- Clean, and in some instances, disinfect, equipment and tools that are used for segregated animals prior to their use with other animals.

2.2 Minimize the Use of the Same Equipment for Both "Clean" and "Dirty" Tasks

Clean tasks are those in which equipment surfaces come into contact with feed, water, and new bedding. Dirty tasks are those in which equipment surfaces come into contact with deadstock, manure, used bedding, and garbage.

Having certain equipment dedicated for clean tasks only, such as handling feed, water, and bedding, and different equipment dedicated for dirty tasks, such as handling deadstock, manure, and garbage, helps prevent disease spread.

The unavailability of separate equipment for different tasks may necessitate alternative approaches:

- Clean, and in some cases, disinfect, the contact surfaces on equipment used for dirty tasks prior to using that equipment for clean tasks.
- Use an intermediary surface, rather than the equipment itself, and dedicate that intermediary to the dirty task only (e.g. use a chain to suspend deadstock from a tractor or a front-end loader bucket, rather than placing the carcass in the bucket itself).
- Use dedicated equipment and single-use needles to administer treatments for segregated and/or sick animals.

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 in Cases of Deliberate Non-Compliance

Perimeters are used, at least in part, to keep some livestock in and other livestock out (e.g. fences, lakeshore, and river edges). To a degree, they minimize the potential contact with animals of other operations or wildlife. Although not a completely effective barrier to disease, natural and fenced perimeters do minimize what might otherwise be an uninhibited commingling of animals and introduction of disease.

Producers are often unable to maintain complete control over access to production areas, and this is understood. Such areas may be public lands, administered by others and/or located at a distance – a considerable distance, in many cases – from the home quarter, headquarters, or farmyard. Alternatively, the production area may be nearby, but along a roadside and/or completely outside the home quarter, headquarter, or farmyard. While people cannot be completely prevented from accessing such land, it is often possible to manage, to a degree, the risk posed by their access through the use of fences and signs.

The perimeters of production areas should generally be sufficient to contain livestock. It is understood, however, that natural boundaries and, in some cases, no boundaries are used at perimeters of some production areas. Access points should have gates, or some other means to prevent access.

2.4 Post Biosecurity Signs at Points of Access to Production Area and Farmyard

Biosecurity signs are posted at gates or entries to the production area where livestock are kept, and the farmyard where the office is located and equipment is maintained. Signs may also be helpful if posted at key points along the perimeters between access points.

Biosecurity signs can assist producers in controlling the traffic flow of people and equipment on, off and, to some extent, within the farmyard and, most importantly, around the production area that holds the livestock, which is of greatest concern. These signs may also be used to inform the public,

visitors and/or personnel that they should not enter, or to indicate where and to whom they should report.

In some cases – at feedlots, for example – there will be a transition from public lands or roadways on to the farmyard, and from there, on to the production area. In other instances – commonly in cow-calf operations, particularly those in Western Canada – the production area is wholly or partially outside the farmyard and is accessible directly from public lands or roadways.

Signs could bear a variety of messages: Do Not Enter – Biosecurity in Effect; Biosecurity Zone; Biosecurity Practices in Place – Report to Office; or Visitors Report to Office.

2.5 Manage and Dispose of Deadstock and Manure to Minimize Contact With Live Animals

Preventing direct and indirect contact between deadstock or accumulated manure, and cattle, other livestock, or wildlife, is another important means of controlling disease. This helps to minimize disease spread from where it may exist (in deadstock or manure) to other livestock or wildlife from which it can spread further.

Most provinces already restrict the management and disposal of deadstock through existing provincial regulations, although often for reasons broader than animal health and biosecurity (e.g. environmental and food safety concerns). Disposal by natural means is permitted in certain provinces on range or pasture, and is subject to certain conditions. Other means permitted for disposing livestock include burying, composting, burning, and rendering.

While many provinces have manure-management regulations, their primary purpose is often to ensure containment relative to water sources and to match nutrient levels in the soil to crop uptake and use.

The following are some suggested manure and deadstock management practices for biosecurity purposes:

- Use dedicated equipment, or clean and, in some cases, disinfect prior to alternate uses.
- Regularly remove manure accumulations from key areas of the production area – in particular, prior to use for calving.
- Inactivate potential disease agents through composting and weathering.
- Contain deadstock and manure prior to disposal.
- Maintain manure-free roads and tracks for use by service vehicles accessing critical locations within the farmyard and possibly the production area.

2.6 Minimize Pests to Reduce Exposure to Livestock to the Extent Practical

Minimizing direct or indirect contact between certain types of pests and livestock can reduce some disease risks. Where these risks exist, pest control may help.

For many operations, complete and/or effective pest control is not feasible. In this situation and when a pest population is a factor in the disease risk, producers should apply alternate disease risk management practices (e.g. increased monitoring, vaccination and/or treatment).

Though not considered pests, certain noxious weeds and foreign or invasive plant species may present a disease risk to cattle. In those areas where weeds or invasive species are a known risk, appropriate practices should be applied to control their spread.

2.7 Manage Livestock to Reduce Exposure to Wildlife to the Extent Practical

Direct or indirect contact between livestock and wildlife may result in exposure to a range of diseases not otherwise managed on an ongoing basis. Further complicating this is the fact that wildlife can serve as a (latent) carrier for diseases common to cattle, creating the possibility for undetected introduction and spread within the herd.

Where possible, livestock should be managed to minimize direct or indirect contact and commingling with wildlife. On many operations, however, it is impossible to manage livestock in a way that fully prevents direct or indirect contact or even commingling with wildlife. Where livestock are in contact with wildlife that has a known disease risk, additional disease risk management measures should be applied, including additional monitoring, vaccination, and/or testing.

2.8 Ensure Facilities Are Maintained and Clean

Facilities, including buildings, barns, chutes, fences, and pens, are not generally the means of introducing disease to the herd. Nevertheless, their involvement may lie in the persistent transfer of disease within a herd, where they are repeatedly used to house or process cattle, some of which may have disease. Thus, keeping facilities clean helps reduce the possible transfer of disease within a herd.

The following are two examples in which the condition of facilities can restrict the ability to address other disease risks with appropriate biosecurity practices:

- The condition and, in some cases, the absence of a chute and squeeze may be an impediment to vaccinating cattle.
- Some segregation facilities may not provide adequate separation from the main herd.

Keep facilities maintained and clean as follows:

- Maintain their condition to ensure animals are contained and can be handled safely.
- Apply appropriate sanitation practices, especially following disease occurrences and prior to calving.
- Maintain facilities in a state of repair that permits their cleaning and, if necessary, disinfection (e.g. buildings and pens housing cattle, feeders, and waterers if used).
- Ensure that garbage is stored in a manner that prevents contact with live animals and that it is removed regularly.



Manage Animal Health Practices

What animal health practices affect biosecurity? The general health of all animals within the operation, and how that health is maintained, is a critical factor that can and should be managed to effectively minimize disease within the operation's cattle herd.

Why are animal health practices important to biosecurity? Healthy animals are less prone to disease, yet many of the day-to-day activities and events that normally occur within beef cattle operations are also opportunities for disease transmission. Accordingly, the processes and practices by which producers maintain their animals in a generally healthy state are critical to the overall biosecurity of the operation.

Target outcomes for animal health practices – Numerous activities, practices, and processes contribute to normal, healthy, and cost-effective production within beef operations in Canada.

3.1 Establish and Maintain a Working Relationship With a Veterinarian

An established relationship implies that the veterinarian has knowledge of the producer's animals, the type and size of operation and potential disease exposure, and the overall management, specifically animal care. This is generally achieved and maintained over time through ongoing communication between the producer and the veterinarian, and may include visits to the operation and/or to the clinic, along with dialogue by telephone, email, and other means.

This relationship is important, as it enables the veterinarian to have the necessary knowledge of the animals and the operation to provide advice that is appropriate to managing the animal health of a specific operation and/or a specific animal.

3.2 Manage Herd Health According to a Documented Herd Health Plan, Prepared in Consultation With a Veterinarian

A Herd Health Plan (HHP) might address the following key elements, as determined in consultation with the producer's veterinarian:

- reproduction (e.g. length of calving season, wean weights, calving patterns);
- nutrition (e.g. overall cow-calf health);
- genetics (e.g. calving ease);
- risk identification (e.g. disease risks relevant to the operation);
- risk management (e.g. practices for buying, vaccination, testing, segregation);
- surveillance (e.g. regular scheduled monitoring by knowledgeable personnel);
- response management (e.g. managing specific conditions that trigger a specific response);
- record-keeping (e.g. documenting the application of disease risk management practices such as vaccinations and tests, as well as incidents and responses); and
- review (e.g. reviewing records and comparing with the HHP to identify shortfalls and necessary changes to specific elements of the HHP).

Documenting (in writing) and preparing the HHP, in collaboration with a veterinarian who has a relationship with the operation, helps to ensure that all risks are considered, that a set of disease risk management responses has been planned that considers the costs and the benefits, and that there will be something to evaluate at a later date to determine whether improvements or changes are required.

3.3 Obtain Water, Feed, Medications, and Other Inputs From Safe and Reliable Sources, and Manage or Maintain to Ensure Their Ongoing Safety and Efficacy

All inputs are a possible means of introducing disease to livestock. Most inputs also serve as necessary ingredients in the treatment and recovery from a disease. As such, inputs, in general, play an important role in managing the health of livestock.

For this reason, obtain inputs from safe and reliable sources, as follows:

- water from the cleanest source available;
- feed from suppliers with protocols to ensure raw materials are harvested, stored, and transported to mitigate disease; and
- medications and supplements from companies that can provide ingredient analysis, batch, lot or registration numbers, and scientific data regarding efficacy.

In addition, manage or maintain inputs to ensure their continued safety and efficacy, as follows:

- Protect feed and supplements from contamination by means of the following:
  - Protect baled hay from wildlife with fencing or tarps.
  - Protect harvested feed and supplements from weathering, contamination with manure, and/or deadstock.
- Store medications according to manufacturer's recommendations (e.g. with regards to temperature, light, humidity, and expiry date).

There are circumstances, however, in which the safety, reliability, or efficacy of certain inputs may be beyond a producer's control. For example, water may be contaminated by wildlife or other factors, on either a regular seasonal basis or as a result of a specific event.

Producers should observe and be aware of these situations and the resulting risk. Producers can then choose to manage the resultant risk through a range of practices that may include alternate sourcing of inputs, increased monitoring, and vaccination.



Educate, Plan, Record

What should be done? Personnel working with/or in contact with beef cattle operations should be aware of and understand the importance of the following:

- biosecurity in their operation and the industry;
- the biosecurity plan for their operation and protocols for tasks within the operation for which they are responsible;
- knowing what action to take in typical and unusual animal health situations; and
- which basic records to maintain on an ongoing basis.

Why are education, planning, and record-keeping important to biosecurity?

Biosecurity is important to individual beef cattle producers for its role in managing endemic diseases, such as infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (BVD), and scours. Any one of these diseases introduced to a herd will severely erode the profitability of any operation.

Biosecurity is also important to individual producers and the industry as a whole for its role in managing emerging or new diseases, and re-emerging or pre-existing diseases returning often in a different or more virulent form.

And finally, biosecurity is critically important to the industry as a whole for its role in controlling the potential spread of foreign animal diseases such as foot-and-mouth disease (FMD).

When producers are aware of the importance of biosecurity and the potential disease risks, they can take appropriate action to enhance biosecurity within their operation and their industry. Planning and record-keeping are two important activities that enhance on-farm biosecurity. Planning assists producers in responding to the range of risks that potentially exist – those that are typical in the operation (high probability) and those that are unusual (low probability), but possibly with high consequence. Record-keeping helps producers evaluate and improve their plans and is critical in controlling an outbreak.

Target outcomes for education, planning and record keeping – The following actions support effective training, planning and record-keeping.

4.1 Ensure That Personnel Understand How and Why Biosecurity Is Applied on Their Operation

Personnel, namely owners, managers, staff, and family members, should receive training on biosecurity measures that apply to the operation as a whole, and their role. Additional training should be provided when new procedures are introduced or roles change. Managers and owners should also review the application of biosecurity practices with personnel and visitors to identify changes where necessary.

4.2 Develop, Document, and Maintain a Biosecurity Plan Specific to the Needs of the Operation

Producers have typically documented a biosecurity plan for their operation. A biosecurity plan should address the following key areas, with current practices documented in simple written protocols:

- sanitation;
- incoming animals;
- deadstock and manure disposal; and
- initial disease response and high-risk biosecurity.

Throughout this Standard, the emphasis is on the actual carrying out of effective biosecurity practices, rather than documenting it in protocols. That said, there is significant value in thinking through present biosecurity practices, evaluating for effectiveness in minimizing or preventing known or potential disease risks, documenting for training and consistent application by all personnel within the operation, and evaluating regularly to identify necessary changes or improvements.

4.3 Ensure That Personnel Know How to Respond to the Range of Animal Health Situations Typical of the Operation

Identify the typical animal health situations for the operation by considering those that have already occurred within the operation and in the area, together with those that might occur. These would include the range of diseases that are managed and are present in the herd or its environment periodically or on an ongoing basis (e.g. IBR, BVD, Johne's Disease, scours).

Standardized approaches that have been prepared for specific situations can be effectively communicated, consistently applied, and evaluated over time to determine their effectiveness. Such approaches need not be highly detailed; however, they should identify those indicators of common situations, the outcomes desired for each, and suggested responses.

4.4 Ensure That Personnel Know How to Respond to an Unusual Animal Health Situation

High rates of disease or death signal an unusual animal health situation. By definition, unusual animal health situations are infrequent or low-probability events, though they may have significant consequences to both the operation and the industry at large.

Personnel throughout the operation must know how to distinguish unusually high levels of disease or death, and be aware of their own roles and appropriate responses. The situation could involve an endemic disease, an emerging or re-emerging disease, or even a FAD.

An appropriate response to an unusual animal health situation includes these elements:

- defined triggers – events that signify an unusual animal health situation (e.g. high rate of disease);
- initial response – the limited number of key actions or decisions to undertake initially (e.g. telephone the operation's veterinarian); and
- a high-risk biosecurity plan – the practices that are appropriate to the conditions of unusually high levels of disease or death (e.g. minimal or no contact with livestock of other operations).

4.5 Maintain Ongoing Records for Animal Health Management

Certain records should be maintained on an ongoing basis on most beef cattle operations:

- records of all visitors accessing the production area or, in some cases, the farmyard;
- records of all movements, involving commingling, purchases, and sales;
- records of all treatments of individual animals and vaccinations, generally on a broader or herd application basis; and
- records of feed purchases and dispositions or use.

These records can provide information about the order of events and the possible changes over time that may be critical in identifying either a typical or an unusual animal health situation, and in effectively managing the response.

If a typical animal health situation were to occur, these records might assist the producer and veterinarian in identifying a mode of transmission and in recommending adjusted practices to avoid similar circumstances in the future.

If an unusual animal health situation, such as a FAD outbreak, were to occur, these records would be critical in identifying potentially exposed herds, method of exposure, and mode of transmission. This knowledge would increase the ability of disease control personnel and producers to successfully contain FAD outbreaks.

While many of these records could have their greatest potential value if they referred or were cross-linked to individual animal identification, it is understood that the industry's use of both identification and traceability is evolving. Accordingly, the degree to which individual animal identification numbers are referenced will vary.

The use and value of records vary with the type of operation. Feed records, in particular, may be more applicable to feedlots buying large quantities of feed than cow-calf operations that pasture cattle or produce their own hay and grain. Similarly, the use of visitor logs to record farmyard access applies more to feedlots than to cow-calf operations.

There are also exceptions to the use of records on certain operations or in specific circumstances. For instance, it may be difficult to obtain all entries for a visitor log in certain range- or pasture-based operations where people can and do enter the production area without permission.

The benefits derived from the time and effort taken to ensure effective record keeping include the following:

- more consistent control throughout the operation by ensuring that practices, medications, etc. are managed as desired and according to a plan that is intended to minimize disease; and
- the ability to conduct regular and/or "after the fact" reviews that can assist in identifying important disease control information, such as the potential cause of disease or additional "at risk" operations or animals.



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Glossary

Biosecurity Terminology

Biosecurity: Those practices that prevent or mitigate the introduction of disease to, its spreading within, and its being released from operations that may contain livestock.

Biosecurity zone: An area where biosecurity procedures are practised and monitored to reduce the transmission of disease (e.g. controlled access zone and/or restricted access zone).

Cleaning: A practice that removes accumulated organic matter and dirt; may be followed by disinfection.

Controlled access: Access managed by way of identifiable entry and exit points in a visually identifiable perimeter demarcation. May include gates, texas gates, or driveways in fences or other visually identifiable perimeter demarcation.

Controlled access zone (CAZ): An area where access is controlled or managed, constituting the home quarter or headquarters, accessible through a controlled access point. Comparable context to the home quarter or headquarters of a beef cattle operation.

Direct contact: Close contact between animals (e.g. nose-to-nose, social interaction, breeding).

Disease: A broadly applied term encompassing the introduction, transmission, spread and/or existence of a range of pests, pathogens, and other disease-causing agents, including toxins, with the emphasis of this Standard being infectious disease.

Disinfection: A practice that inactivates or destroys disease organisms, and that must be preceded by cleaning.

Fomite: Any inanimate object or substance on which disease may be carried or transferred. May include, but is not limited to, vehicles, equipment, tools (veterinary and other), clothing and shoes.

Indirect contact: Common contact between animals through a person, piece of equipment, surface, insect, etc.

Practice: A generally observed procedure that is followed by the operator(s), and not necessarily documented or detailed to the extent of a protocol.

Protocol: A defined and documented procedure to be followed, detailing the steps to follow to meet an objective.

Restricted Access Zone (RAZ): Area or physical location of livestock, or where they may be held, and where additional procedures to reduce disease transmission are applied, including further restrictions on the movements of people and equipment. Typically accessed through a controlled access point from the CAZ and contained within the CAZ. Comparable in context to the production area of a beef cattle operation, although access often cannot be controlled and location is often outside the home quarter and headquarters.

Sanitation: An overarching set of practices that reduce the presence of organic material and debris and the presence, survivability, and infectivity of disease agents.

Secured access: Access through controlled access points is prevented, apart from deliberate non-compliance. Might include gates or doors in fences or buildings in visually identifiable perimeter demarcations capable of restricting livestock movements and human movements.

Equipment

Equipment: Farm machinery, implements, and livestock conveyances, excluding vehicles for personal and business transport.

Vehicles: Intended for personal and business transportation (not livestock transportation).

Feed

Grain: Grain-based animal feed.

Roughage: Grass or legume-based animal feed.

Land and Operations

Farmyard, home quarter or headquarters: The operation's home farm, ranch or land parcel.[5] May differ from the term "premises," used in the context of traceability, and having a narrower definition.

Operation: Business entity, typically comprised of one or more parcels of land.

Production area or stock-keeping area (PA): The operation's corrals, pens, barns, and pastures where livestock are or may be kept.[6]

5 Comparable context to Controlled Access Zone
6 Comparable context to Restricted Access Zone

Other

Commingled animals: Animals having contact with animals of other species or other operations.

Compost: The active process (piled, windrowed, turned, etc.) of controlled biological decomposition of bedding, manure, and waste to eliminate disease and produce a mature soil amendment. Provision of compost for retail packaging and sales typically meets this definition; piled or stored manure does not.

High-risk animals: Animals with a greater risk than others of transmitting a disease, or an unknown risk, including those of unknown health status, of a different species, not part of the herd, returning after being away from the herd, or sick or recently recovered.

Incoming animals: Animals that have been purchased or acquired for introduction into the resident herd or animals returning from a brief absence from the herd (exhibition, show, etc.).

Personnel: Staff, owners, and operators and their family members.

Pests: Vermin, including mice, rats, insects and birds.

Highly susceptible animals: Animals that are at greater risk than others of infection following disease exposure, including calves or young stock; sick, stressed, or recently recovered animals; and those lacking immunity or resistance.

Visitors: All people entering the farmyard (home quarter or headquarters) or production area with permission (e.g. service providers and professionals, school tours, international visitors), excluding personnel.

Wildlife: Game and non-game animals, such as deer, elk, and others; fur-bearing animals such as skunks and beavers; predators such as coyotes and wolves; and birds.



Advisory and Management Groups

Development of the Standard benefited from comments and direction provided by members of these Advisory and Management Groups:

- **Beef Biosecurity Advisory Group:**
  - Trevor Atchison, Manitoba Cattle Producers Association
  - Francois Bedard, Agriculture and Agri-Food Canada (AAFC)
  - Nathalie Côté, Fédération des producteurs de bovins du Québec
  - Dr. Glen Duizer, Manitoba Agriculture, Food and Rural Initiatives
  - Russ Evans, National Cattle Feeders' Association
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  - Dr. Patricia Pentney
  - Dr. Manon Racicot

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Their interest, participation, and contribution are greatly appreciated.



Developing the Standard

The Standard was developed over the course of two years. During this time frame, a biosecurity standard for Canada's beef cattle industry was analyzed, using a range of tools, summarized together with the following key findings:

- **Review of cost-benefit considerations:**
  - Whether in Canada or abroad, the data simply are not available for evidence-based, quantitative, cost-benefit analysis of a collection of practices, such as this Standard, notwithstanding some limited analysis of individual and disease-specific practices.
  - Accordingly, this Standard was designed first to be "low cost," and second to have a readily apparent capacity to reduce disease at both the farm and national herd level.
  - From this qualitative perspective, this Standard is favourable from a cost-benefit consideration.

- **Gap analysis:**
  - Existing national, non-government programs were evaluated for their alignment with biosecurity and future voluntary programming in support of the Standard.
  - There are opportunities to support the Standard from existing programs, though none are fully aligned at present.

- **Literature review and identification of cited practices:**
  - A review of published and unpublished literature supported most of the analysis noted elsewhere in this section, leading to a list of practices cited as having positive impacts on disease in cattle. A number of informal standards – collections of practices – were also identified and reviewed.
  - In the context of Canada's national beef cattle industry, a biosecurity standard does not exist, although a considerable amount of background information was obtained.

- **National consultation to identify current biosecurity practices in Canada's beef cattle industry:**
  - An understanding of animal health and biosecurity practices current in Canada's beef cattle industry was established in an on-farm, in-person benchmarking study of a producer sample representative of the geography, size, and operational-type distributions occurring in the population.
  - This benchmarking of current practices helped in designing a Standard specifically for the beef cattle industry that is both practical and effective.

- **National consultation on a draft Standard:**
  - A complete draft of the Standard, resulting from revisions suggested by the Advisory and Management Groups, was reviewed in stakeholder consultations held across the country. Some 13 meetings were held with a cross-section of stakeholder representatives and others engaged in the beef cattle industry.
  - The draft was considered an acceptable basis upon which to prepare a final Standard.