BIOSECURITY PRINCIPLES AND BEST PRACTICES

FOR ALBERTA LAMB PRODUCERS

Simple practices built into everyday operations

AB.VMA Alberta Veterinary Medical Association

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Alberta Lamb Producers

BIOSECURITY PRINCIPLES AND BEST PRACTICES

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HOW TO USE THIS BOOKLET

This booklet was developed and produced specifically for sheep producers as livestock operators in Alberta. It was developed as a cooperative effort between the Alberta Veterinary Medical Association and Alberta Lamb Producers organization to help support individual producers efforts to increase the safety and security of their sheep flocks and their families. Each producer is different in their operation, flock demographics and business goals and this guide is a valuable resource to educate producers of the importance, principles and practices of disease prevention and control, specific to the lambing industry.

To use this guide, read it through once. It is organized in a way to guide reader's learning from considering the importance of biosecurity to identifying risks specific to each operation and finally onto operational practices that will help producers minimize the risks to their flocks.

At the back of the guide, there is a Glossary of Terms and a Risk Assessment Chart both developed to help producers get started developing custom biosecurity programs for their operations.

It is important to understand that this guide was designed to equip producers with the basic information to start developing or updating their own biosecurity programs. Each producer will benefit from the input of their herd health veterinarian, who, ultimately, is the person most qualified to provide recommendations for individual animals and flocks. This guide does not replace the service a veterinarian can offer, it serves as a tool to encourage producers to enter into an educated discussion with their veterinarian.

CONSIDER THE FOLLOWING REAL LIFE SCENARIO

A family with a small flock of sheep decided to take 3 animals for shearing to a neighbour's farm. The animals were transported and set-up in a pen beside another group of sheep and goats. The animals were separated but the fencing allowed nose-to-nose contact with the other animals. Another neighbour had forgotten to bring their own pair of clippers and asked to borrow the family's only pair. The clippers were returned and used later in the day for a shearing demonstration. The day was a huge success and the family returned home. The 3 animals were immediately reintroduced into the flock upon arrival at the farm and the equipment used for the demonstration was returned to the barn. Two months later, that summer, 3 animals on the family's farm were diagnosed with visible abscesses around the neck and another 2 animals were losing weight in the fall. The herd veterinarian visited the flock and diagnosed the 5 affected animals with Caseous Lymphadenitis (CL).

Highlight the actions that put the individual animals at risk and then the home herd at risk.

What could the family have done to protect their travelling animals from contracting Caseous Lymphadenitis (CL) and infecting the home flock?

The answers can be found throughout this book and at the end of the manual.

WHY ARE BIOSECURITY PROTOCOLS IMPORTANT AND HOW CAN YOU BENEFIT?

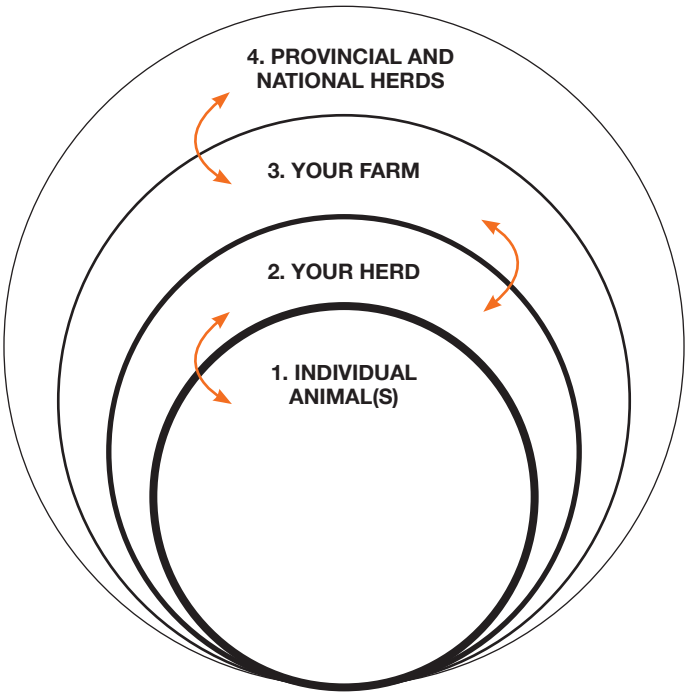
- Prevent the introduction and spread of disease within your farm and between farms
- Prevent financial losses from animal illness as well as clean-up costs
- Limit the spread of disease between farms, animals and people alike
- Promote economically sustainable operations and industry by preventing introduction of disease
- Minimize the risk of introduction of a Foreign Animal Disease (FAD) that could devastate your operation and Alberta's livestock industry
- Support sustainable agriculture and increase your competitiveness in the market

WHAT IS BIOSECURITY?

Biosecurity refers to principles, actions, precautions and protocols that protect the health of livestock by preventing the transmission of disease through physical barriers, and hygiene practices.

Biosecurity is protecting a farm and/or areas within the same farm against biological agents that can cause disease. It is a strategy of prevention; prevent introduction of disease and prevent recycling disease.

BIOSECURITY IS A STRATEGY OF PREVENTION; PREVENT INTRODUCTION OF DISEASE AND PREVENT RECYCLING DISEASE.



- This diagram represents the relationship between your individual animals through to provincial and national herds and industries.

Effective biosecurity practices, doing little things right every day, will break the chain of transmission and make our industry stronger. Biosecurity promotes a sustainable lamb industry by being proactive being proactive towards disease transmission, instead of reactive to a disease threat. Applying sound principles and practices **NOW** will help us weather future risks to the sheep industry.

DOING LITTLE THINGS RIGHT EVERY DAY.

The principles and practices in this manual can serve to protect individual animals or groups of animals on the same farm and each group up the production value chain.

HOW TO DEVELOP AN EFFECTIVE BIOSECURITY PROGRAM

STEP 1: CONDUCT A RISK ASSESSMENT

Biosecurity is about identifying risk and taking action. What operational practices put you at risk of disease introduction, recycling and or transmission?

Biosecurity programs should be developed specific to each flock, and/or facility`s individual needs. The most effective way to evaluate need is to **complete a risk assessment survey of risk factors.** Contact your veterinarian if you would like assistance to complete or interpret the risk assessment.

During a risk assessment, you can clearly identify the following:

1. *What areas have sufficient biosecurity in place?*
2. *Where can biosecurity measures be improved?*
3. *How can biosecurity be improved?*

Risk assessment surveys may be separated into 5 sections:

1. *Animal Risk Factors*
2. *Feed and Water Risk Factors*
3. *Owner and Employee Risk Factors*
4. *Visitor and Facility Users Risk Factors*
5. *Premise Risk Factors*

Each area inquires about your current practices for disease control and prevention.

Once risk assessment has been completed, the next step is to decide what level of biosecurity and •biocontainment you want to engage in. Sheep owners can have an educated discussion with their veterinarian about biosecurity and make informed decisions about which biosecurity protocols to implement to manage their unique risk.

YOUR VETERINARIAN CAN HELP YOU PRIORITIZE AREAS THAT YOU WANT TO MAKE MORE BIOSECURE, BASED ON YOUR REAL AND PERCEIVED RISKS.

At the back of this booklet is a Risk Assessment Chart for sheep producers to effectively review their current flock demographic, premise design/layout and other risk factors to pinpoint disease control and areas for risk management strategies. A completed Risk Assessment can serve as a powerful tool to use in discussions with your veterinarian about specific protocols that you may consider implementing based on identified risk.

What diseases am I concerned about? **What diseases should I be concerned about?** What am I already doing to limit introduction of disease to my flock?

WHAT ARE YOUR ANIMALS AT RISK OF CONTRACTING?

The following diseases are presented with consideration to:

- What is the risk of getting the disease?
- What are the consequences of contracting the disease?
- What is the risk and consequence of transmitting the disease from animal to animal, within your flock?
- If your animals contracted this disease, how much would it cost you in labor , medications, decreased rate of weight gain and/or death loss. And loss of market access?

This chart is not exhaustive on a specific disease, diagnosis, treatment or prevention, consult your veterinarian.

DISEASE	DESCRIPTION	RISK LEVEL[1]	DISEASE TRANSMISSION	COMMON SYMPTOMS	RISK TO FLOCK, INDUSTRY AND HUMAN HEALTH
ANAPLASMOSIS	An infectious, non-contagious bacterial disease caused by Anaplasmosis ovis that can affect sheep and goats	4	Spread by ticks, insects, and blood contaminated equipment	Affects red blood cells causing severe anemia and weakness	Infrequently found in Canada, therefore, a • **Nationally Reportable**[2] disease
ANTHRAX	A zoonotic disease that is caused by the spore forming bacteria Bacillus anthracis that commonly lives in the soil	3	Changes in weather and soil conditions can increase flock risk	Animals are usually found suddenly dead	Highly contagious and Zoonotic Nationally Reportable disease
CASEOUS LYMPHADENITIS (CL)	A contagious bacterial disease caused by Corynebacterium pseudotuberculosis that is characterized by abscesses in the skin, lymph nodes, and internal organs	1	Spread by contact with bacteria living in discharge from abscesses	Internal abscesses can cause respiratory problems, weight loss, and poor fertility	Easily transmitted by contaminated equipment, living quarters, and soil Identification and removal of infected animals most effective method of control
CLOSTRIDIUMS	Clostridiums are a constant threat to animal producers because the bacteria are common in the soil and the intestinal tract of animals. Animals may acquire infection by ingesting the bacteria or from a wound that gets contaminated.				
BLACKLEG	An acute bacterial disease caused by Clostridium chauvoei	1	Soil or fecal contamination of wound	Painful lameness, swelling, fever, and death	Good hygiene during tail-docking, castration, and shearing is important to reduce risks
TETANUS "LOCKJAW"	An acute bacterial disease caused by Clostridium tetani which releases a toxin affecting muscle contractions	1	Soil or fecal contamination of wound	Lameness, stiffness, muscle spasms, and death	Good hygiene during tail-docking, castration, and shearing is important to reduce risks
CLOSTRIDIUM PERFRINGENS TYPE C AND D	*Clostridium perfringens* is a bacteria normally found in the intestinal tract of healthy animals	1	Periods of stress can cause a bacterial overgrowth	Depression, abdominal pain, bloody diarrhea, and neurological signs	Avoiding environmental stressors, reducing parasite burden, and vaccinations can help to reduce impact on flock

1 These numbers correspond to the sphere(s) of who is at risk from this disease from the circular diagram on page 7.

2 Nationally and/or provincially reportable diseases require action to control or eradicate because they are a threat to animal or human health, food safety or the economy. Anyone who knows or ought to know that any of these diseases are or may be present in an animal MUST report that fact to the ***Office of the Chief Provincial Veterinarian*** *within 24 hours by calling* ***1-800-524-0051.***

DISEASE	DESCRIPTION	RISK LEVEL	DISEASE TRANSMISSION	COMMON SYMPTOMS	RISK TO FLOCK, INDUSTRY AND HUMAN HEALTH
FOOT AND MOUTH DISEASE	A highly contagious viral disease of cloven hoofed animals. Not present in Canada and considered a Foreign Animal Disease (FAD)	1	Spread by direct or indirect contact with infected animals or food products	Painful sores and ulcerations in the mouth and feet	Poses a huge economic risk if this disease enters Canada, therefore a Nationally and Provincially Reportable disease
FOOT ROT	A highly contagious bacterial disease caused primarily by Dichelobacter nodosus	1	Infected animals transfer the organism to the soil and increased infection risk with wet conditions	Severe lameness and secondary infections due to the horny part of the hoof separating from the underlying tissue	Can cause significant economic losses, preventable by employing appropriate biosecurity recommendations
JOHNE'S DISEASE PARATUBERCULOSIS	A contagious disease caused by the bacteria Mycobacterium paratuberculosis that affects the intestines and can cause chronic wasting	1	Infected animals can appear normal and continue to shed bacteria in the milk and feces	Can affect the intestines causing weight loss and diarrhea	Following appropriate biosecurity measures is imperative for prevention and control as no treatment exists
CONTAGIOUS ECYTHEMA "ORF"	A contagious skin disease caused by a Parapoxvirus	1	Spread by direct or indirect contact with infected animals or contaminated environment	Causes crusty proliferative sores on the mouth, feet, and eyelids which can cause poor appetite and lameness	Zoonotic - Caution when handling affected animals Following appropriate biosecurity measures is imperative for prevention and control
RABIES	A highly fatal viral infection of the central nervous system caused by a Rhabdovirus which can affect all warm blooded animals	1, 4	Transmitted by bites from infected wildlife	Causes incoordination, aggressive behaviour, paralysis and eventual death	High human health risk – Zoonotic Nationally Reportable disease
SALMONELLA	A bacterial disease of the intestines	1, 4	Infected animals shed bacteria in the feces to pass the bacteria to other sheep in the herd and put human caretakers at risk.	Can cause abortions, diarrhea and acute death	Some species are Zoonotic

DISEASE	DESCRIPTION	RISK LEVEL	DISEASE TRANSMISSION	COMMON SYMPTOMS	RISK TO FLOCK, INDUSTRY AND HUMAN HEALTH
1 **SCRAPIE**	Scrapie is an infectious disease belonging to the group of transmissible spongiform encephalopathies (TSE) which affects the central nervous system	4	Mechanism of transmission is not completely understood	Can cause behaviour changes, weakness, weight loss, and death	Nationally and Provincially Reportable disease
2 **SHEEP POX**	An infectious disease caused by a poxvirus and is not present in Canada and considered a Foreign Animal Disease (FAD)	4	Not present in Canada	Causes fever, poor appetite, and classic pox lesions on the skin	Nationally reportable disease Zoonotic
Q FEVER	Query or Queensland fever (Q fever) is an infectious disease caused by Coxiella burnetti	1	Spread by contact with aborted material, contaminated pastures, and contact with infected animals	Can cause abortions and stillbirths in late gestation	Human health risk – Zoonotic Caution when handling feces, placenta, or milk from infected animals
CHLAMYDIA	Chlamydia psittaci is a common cause of infectious abortions in Sheep	1, 4	Infected females shed the organism and wild birds may provide a reservoir	Can cause pneumonia, eye infections, and abortions	Zoonotic - especially to pregnant women

1 Scrapie Fact Sheet; CFIA, http://www.inspection.gc.ca/english/anima/disemala/scrtre/scrtrefse.shtml

2 Sheep and Goat Pox Fact Sheet; CFIA, http://www.inspection.gc.ca/english/anima/disemala/poxovi/poxovifse.shtml

STEP 2: *IDENTIFY PROTOCOLS FOR YOUR OPERATION*

Let's be honest. Biosecurity isn't convenient. If it was, everyone would do it! It is necessary to protect your flock's health.

Effective biosecurity protocols serve to protect sheep flocks and human health from animal borne diseases, such as Salmonella, Listeria, Orf and Rabies. Implementing an effective biosecurity program protects the producer, the producer's family and contributes to a safe and healthy community.

The best management practices[1] (BMP) listed and discussed in this manual are based on three pillars of biosecurity. The three pillars of biosecurity are:

- *Access management*
- *Animal health management*
- *Operational management*

You can develop your customized biosecurity program using the three management pillars of biosecurity based on the risks you identified by completing your risk assessment survey.

These pillars cannot be viewed in isolation. To do so may give you a false sense of security that you are doing what you can to be proactive in disease control. You must consider all the variables: animals, facilities and people to develop the best most effective program for your flock and premise.

YOUR VETERINARIAN IS THE TRAINED PROFESSIONAL TO CONSIDER FOR ALL THE VARIABLES AND RISKS AFFECTING YOUR OPERATION AND OFFER ADVICE ON YOUR OPERATION.

1 **A best management practice (BMP)** *is a program, process, strategy, or activity that has been shown to be effective in the prevention of disease transmission; is based on current information; Is of value to, or transferable to, other operations.*

Throughout this section, you will find bubbles containing practical tips every producer should consider when implementing in their operation. Every effort has been made to identify how each action will safeguard your animal's wellness and your business.

PILLAR 1: ACCESS MANAGEMENT

1.1 CONTROL ACCESS TO FARMS AND BARNS AT CRITICAL CONTROL POINTS

- Critical control points are points where people or animals can access a zone. It is a place of transition from one zone to the next. Cleaning footwear, changing footwear or outwear and washing hands may be required when going from one zone to a zone of diferent security.
- Establish zones to reflect differing levels of biosecurity protocols in place
- **ZONES MAY INCLUDE**
    - *Controlled Access Zone*
    - *Restricted Access*
    - *Quarantine*
    - *Isolation*
- **Controlled Access Zone** is an area that you may identify around barns, pens, handling areas that should be restricted to producers and employees. May be identified by a fence, sign, strip of crushed gravel etc.
- **Restricted access zones** should be any area/pasture/pen where animals commonly reside
- **Isolation** may be used for newly arriving animals as an evaluation for disease status before being introduced to main herd or for animals that may be at risk of contracting disease "compromised animals"
- **Quarantine** is a term used to identify the highest level of controlled access and exit
- Establish **visitor parking** well away from barns, pens and pastures.
- **Disinfect** thoroughly delivery and supply trucks, transport trucks, tractors, bobcats etc. before entering the Controlled Access Zone and animal handling/living areas

Post visible signs on your premise that indicate Biosecurity Protocols in Effect. Consider laneways, barn entrances, paddock/pasture entrances

PILLAR 2: ANIMAL HEALTH

2.1: IDENTIFY INDIVIDUAL ANIMALS BY PARTICIPATING IN TRACEABILITY PROGRAMS

- Identifying each animal, with a metal lamb tag, button tag or RFID tag, is the basis of managing animals, tracking movements and documenting risk exposure
- As of January 1, 2012, all sheep leaving the premise of origin are required to be identified by CSIP ear tags which must be RFID tags

CALLOUT: YOU CANNOT MANAGE AN ANIMAL YOU CANNOT IDENTIFY.

- All lambs that are born in 2012 are required by CFIA to have a federal CSIP RFID ear tag if they leave the farm/ premise of origin

New animals present a significant risk to the health of your flock. Quarantine new animals for **3 weeks** to determine health status.

2.2: PLAN ANIMAL MOVEMENTS TO MINIMIZE RISK OF INTRODUCTION, TRANSMISSION OR RECYCLING OF DISEASE

- Arrange pens or gates in a manner to be able to easily move animals without cross contaminating other living areas
- Do not move young or sick animals through heavily used areas

ENHANCE ANIMAL SEGREGATION WITH ADDITIONAL BIOSECURITY MEASURES

- Regulate pedestrian and vehicle traffic and manure flow in direction and/or timing to reduce cross contamination of pathogenic organisms from one pen of animals to another
- Limit equipment movement between pens. Clean and disinfect thoroughly if unavoidable
- Handle animals youngest before oldest and healthy before sick as routine practice
- Ensure transport trailers are clean, disinfected and rinsed properly prior to loading animals

2.3: MONITOR HERD HEALTH

- Establish and follow daily procedures for observing animals and keep a daily herd health log for each herd
- In conjunction with your veterinarian, establish a Disease Response Plan that indicates when to contact a veterinarian and who will contact the veterinarian. It may also include diagnostic action to be taken and treatment protocols
- In conjunction with a veterinarian, develop a comprehensive vaccination program specific to your herd's risks as identified by your herd survey
- **Vaccinate all animals on the premise according to your veterinarian approved vaccination protocol, including working and guardian animals**
- Establish a parasite control program for all sheep, goats and resident dogs, including working, guardian and pet dogs
- **Isolate** new animals for 3 weeks until disease status is established and vaccinations are effective
- Place sick animals in isolation to avoid recycling disease in the flock
- **Use colostrum from your own animals or purchase a commercial colostrum and milk replacer.**

USE COMMERCIAL COLOSTRUM OR COLOSTRUM FROM YOUR OWN ANIMALS

PILLAR 3: OPERATIONAL MANAGEMENT

3.1: CLEAN AND DISINFECT EQUIPMENT AND BARNS

- Wash vehicles that enter the Controlled Access Zone, regularly, especially after visiting another farm. Use a high pressure washer to clean and disinfect the under carriage and wheel wells
- Keep the interior cab of farm vehicles clean and free of dirty coveralls, boots or equipment. Disinfect regularly. This step will help prevent the movement of pathogens between groups of animals and/or premises
- Do not share equipment with other farms. Purchase commonly used equipment for your own use and keep it in the barns to minimize disease introduction or transmission
- Follow manufacturer's directions when using commercial cleaning and disinfection products

3.1A CLEANING AND DISINFECTING TIPS

KEEP IN MIND THE FOLLOWING POINTS WHEN CLEANING AND DISINFECTING EQUIPMENT, BARNS, PENS, STALLS:

- **Clean surfaces first!** Organic material significantly reduces the activity of disinfectants; Cleaning is the removal of dirt and fecal material (organic material) that can protect and/or carry pathogens and FAD viruses
- Read all labels thoroughly for Use, Direction, Safety Requirements and Toxological Information
- Cleaning and Disinfection requires a protocol just as vaccination and medication programs
- Document your cleaning routine or protocol. Include product used; rationale for selection of that product; concentration used (include calculations); mixing procedure; volume used; area covered; spray or fog; safety; procedures; drying conditions; cleaner used (cleanliness rating); validations
- Disinfectants have strengths and weaknesses. Those that are excellent against bacteria may not be the product of choice against viruses. Ease of application and safety are major considerations. If you need help, consult your veterinarian for advice on disinfectants for specific diseases
- More is not necessarily better. Measure disinfectant concentrate and water to use the correct dilution of disinfectant. Disinfectants work best at approved levels

MEASURE DISINFECTANT CONCENTRATE AND WATER TO BE SURE YOU ARE USING THE CORRECT DILUTION OF DISINFECTANT.

- Use warm or hot water to mix disinfectants as most disinfectants, detergents and soaps have increased activity in warm water
- Label prepared solutions with date it was mixed, effective until date or do not use after date (date of expiry), product name and concentration and initials of who prepared the solution
- Disinfectants require contact/exposure time
    - *Phenols and quaternary ammonium need at least 10 minutes*
    - *Chlorine and iodine are fast*
    - *Formalin and oxidizing agents are intermediate*
    - *Rinse thoroughly if indicated on directions*
- Store concentrates in cool dry place with lids tightly fastened

TYPE	PRODUCTS[1]	USES[2]	ADVANTAGES	DISADVANTAGES	CAUTIONS[3]
ALCOHOLS	AlphaDyne Plus (Chemi3); Relyon Disinfectant Spray (Dupont)	Disinfecting	Rapid action, evaporate with little residue; good for disinfecting clean hands	Fast evaporation reduces available contact time; Reduced activity in the presence of organic matter	
ALDEHYDES: FORMALDEHYDE/ GLUTERALDEHYDE	Formaline (Vétoquinol); Profilm® (Pfizer); Virocid ® (Merial	Vapor-Phase Surface Disinfecting Fumigant			Eye and skin irritation. Poisonous if inhaled.
HYPOCHLORITES	BioSentry™ Chlor-A-Foam™(Pfizer); Javex® (Colgate-Palmolive)	For the cleaning and disinfection of hard non-porous environment surfaces	Viricidal; biodegradable	Do not mix with other disinfectants. Do not use with acid cleaner.	Keep out of reach of children. The powder is irritating to eyes, skin and mucous membranes.
IODOPHORS	Biodine, Mikroklene, Barn-Storm Iodine Cleaner Sanitizer (Ostrem)	Cleaning and disinfecting buildings, crates and trucks	Not adversely affected by water hardness or low temperature water. Inexpensive; many are biodegradable; long storage life	No residual activity. Stains some surfaces; Rapidly inactivated in organic material; Effectiveness decreased in basic pH (>7)	May cause burns to the skin and eyes. The vapour is harmful if inhaled.
OXIDIZING AGENTS	Virkon (Vétoquinol); Hyperox (Vétoquinol); Hyperox	Cleaning & disinfection of surfaces & equipment. Aerial disinfection Sanitizing drinking water system	Biodegradable	Do not exceed thirty minutes for metal objects. Handle in such a way to minimize dust release.	Do not get powder in eyes. Powder irritating to eyes, skin and mucous membranes. Poison
PHENOLS	1-Stroke Environ® (Steris); Multi-Phenolic Disinfectant (Bio Agri Mix); Environ LPH	Simultaneous cleaning, disinfection and deodorization.	Not affected by hard water, has residual activity, good storage life; Effective in presence of trace amounts of organic material; Compatible with many soaps, detergents ; Good residual activity; Does not stain surfaces	Concentrate is corrosive.	Causes eye and skin damage. Do not get in eyes, on skin or on clothing

1 Does not constitute an endorsement or guarantee effectiveness of product.
2 Consult a professional for recommendations for specific purposes.
3 Read all warning and labels. Follow manufacturer's directions.

TYPE	PRODUCTS[1]	USES[2]	ADVANTAGES	DISADVANTAGES	CAUTIONS[3]
QUATERNARY AMMONIUM	BioSentry™ 904™ (Pfizer); Clinicide (Bimeda-MTC); Proquat® (Pfizer); Quatsyl®-D Plus (Pfizer); Rocco (Vétoquinol)	Cleaning and disinfection of vehicles, animal buildings and equipment.	Effective at high pH and temp.; Very good storage life; Many are biodegradable; Effective over wide pH range. Detergent activity, residual activity	Inactivated in organic matter, hard water and by many soaps/ detergents	Corrosive to eyes. Wear goggles or face shield, protective clothing and rubber gloves when handling.
PEROXIDE	Peroxigard™ (Bayer), accelerated hydrogen peroxide	Sanitizing and disinfecting in veterinary hospitals and animal care facilities.		Corrosive material. May dry with a residue that requires rinsing. Do not mix with other cleaning or disinfecting products	May cause burns. Avoid contact with eyes and skin. Wear suitable protective clothing. Do not store in food processing areas. Avoid storage at elevated temperatures.

3.2: USE PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal protective equipment (PPE) increases the level of protection for you and your flock from disease causing pathogens. Common PPE that may be of use on your farm includes gloves, coveralls and impermeable footwear.

Gloves: Gloves should not replace good hand washing, but they do add a layer of protection. In the event you are handling sick animals, deceased animals or animals at high risk of contracting disease, like newborn lambs, consider adding gloves to your barn cupboard. Many options are available at your veterinary clinic or animal health supply store, including latex, non-powdered and vinyl (in fun colors too!). While wearing gloves, or hands are dirty:

- Avoid touching surfaces with gloves on
- Disinfect any equipment you use while wearing the gloves
- Use gloves only once and then dispose
- Wash hands after removing gloves

1 Does not constitute an endorsement or guarantee effectiveness of product.
2 Consult a professional for recommendations for specific purposes.
3 Read all warning and labels. Follow manufacturer's directions.

Coveralls or other animal specific outwear should be used whenever you are in contact with animals or related equipment. Designate a set for use by visitors. They should be laundered regularly or disposable and kept out of vehicles to avoid transmitting organisms.

Best Management Practice (BMP): Use disposable coveralls in specific zones, like **isolation** or **quarantine areas.** Alternatively, keep one pair for use in isolation or the sick pen. Identify these clearly and wash with bleach, separate from regular coveralls.

WASH ISOLATION OR QUARANTINE COVERALLS WITH HOT WATER AND 1 CUP OF BLEACH PER LOAD OR AS PER MANUFACTURER'S DIRECTIONS FOR LAUNDERING

Footwear should be impermeable, easy to clean, with shallow treads. (The deep ones really hold onto organic material which can house organisms and transmit disease). Similar to coveralls, premise specific boots should be worn in all animal handling and living areas.

Boot baths are falling out of popularity because they must be maintained and replenished regularly to be effective. Instead, wear boots that can be scrubbed with a brush to remove organic material (manure, soil etc.) and then use a spray bottle filled with disinfectant on the treads and the outside of the boots. Then they are ready to go next time you need them.

Keep your bugs at home by wearing clean footwear when you leave your farm. Or keep a scrub brush, detergent and disinfectant bottle at the back door or barn door for a quick clean and spray on your boots. And when you return home from a neighbour farm or an agricultural venue/event, spray your boots to keep your flock safe.

For producers, staff and visitors entering restricted areas, including **isolation** or quarantine:

- Consider using disposable booties and coveralls for use in isolation areas. Dispose of in a secure manner!
- Wear clothing that will only be worn on premises under common practice such as clean or disposable coveralls. Remove them prior to entering farm service vehicles, offices, and residences. Leave germs at home and in the corral.
- Have clean coveralls and boots available for visitors and service personnel…and make sure they use them! This will minimize the risk visitors will introduce a **pathogen** into your herd.

Your footwear goes a lot of places! Use easy to clean and disinfect boots in animal handling areas to limit the disease causing organisms you might track around your farm or community. Clean and disinfect footwear regularly. Dedicate farm specific footwear. Don't wear your work boots to the neighbours....

3.3: CONTROL PESTS

- Use bait stations to control rodents. Monitor bait stations for effectiveness. Be sure they are out of reach of pets, children and other livestock!
- Keep feed in rodent proof containers
- Clean up feed spills immediately to eliminate food sources for rodents
- Do repairs in a timely manner to minimize rodent entry and living areas
- Fill holes where water can stagnate and become breeding grounds for insects

3.4: COMMUNICATE BIOSECURITY PROGRAM EFFECTIVELY

Your biosecurity program is only as effective as your commitment to maintaining it every day. In addition, ensuring that staff, family, friends and neighbours are aware of your efforts goes a long way to keeping your program effective. Therefore:

- Use highly visible clear signage to post your biosecurity protocols
- Include biosecurity protocols in staff training and document employees completion of training

Identify visitor parking well away from barns, pens and pastures. Keep a visitor log book with the date, name and if the person has had any animal contact in the last 7 days.

- Review established protocols and practices for effectiveness. Improve as necessary.
- Identify access/entry points (roadways, laneways etc.), ideally with a physical barrier such as a gate
- Identify Visitor Parking well away from barns, pens and pastures
- Make Visitors aware of biosecurity protocols before arriving on the farm

- Keep a Visitor log book with date, name and any previous animal contact in the last 7 days. This information can help you to identify who is a threat to your herd's health and who may be at risk if your herd contracts a transmissible disease.
- Visitors should be accompanied by the producer or an employee at all times to assist in compliance with biosecurity protocols

ACCESS MANAGEMENT

- Understand your animals and farms risk.
- Control access to your farm and animals at critical points
- Manage visitors' risk

ANIMAL HEALTH MANAGEMENT

- Plan animal movements to minimize introduction, transmission or recycling of disease
- Monitor herd health
- Quarantine new animals for 2-3 weeks

OPERATIONAL MANAGEMENT

- Clean and disinfect equipment
- Use PPE
- Wash hands prior to and following animal contact
- Control Pests
- Communicate your biosecurity program clearly & effectively

HAND WASHING TIPS

Washing hands regularly and wearing appropriate protective outerwear can make the difference to prevent introduction and recycling disease causing pathogens. Below are some tips on proper techniques:

HAND WASHING PROCEDURE

If hands are free of gross contamination (i.e. not visibly dirty)

1. Pump a fair amount of alcohol gel into the palm of one hand.
2. Rub gel over all surfaces of the hands for 30 seconds and allow hands to air dry.
3. Keep refillable bottles in barns, at entry and exit ways and at gates to pens for easy use. You can't use it if it isn't there!

If hands are grossly contaminated (i.e. visibly dirty):

When possible, use hands-free operation sinks:

1. Pump antiseptic soap onto hands and wash for at least 30 seconds, including fingernails
2. Use a hand brush and nail cleaner if nails are particularly soiled
3. Use paper towels to dry hands or small hand towels. Launder hand towels between each use. Towels house bacteria and can hide disease causing agents.

At regular sinks:

1. Wash hands for 30 seconds with antiseptic soap—including under fingernails
2. Use a hand brush and nail cleaner if nails are particularly soiled
3. Rinse hands
4. Use paper towel to dry hands, and use paper towel to turn off tap

The easiest and least expensive way to protect yourself and your flock is to practice good personal hygiene before and after handling animals or between groups of animals.

REMEMBER THE FAMILY FLOCK THAT **CONTRACTED CL?**

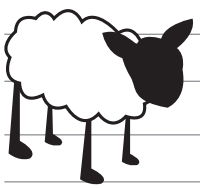
A family with a small flock of sheep decided to take 3 animals for shearing to a neighbour's farm. The animals were transported and set-up in a pen beside another group of sheep and goats. The animals were separated but the fencing allowed nose-to-nose contact with the other animals. Another neighbour had forgotten to bring their own pair of clippers and asked to borrow the family's only pair. The clippers were returned and used later in the day for a shearing demonstration. The day was a huge success and the family returned home. The 3 animals were immediately reintroduced into the flock upon arrival at the farm and the equipment used for the demonstration was returned to the barn. Two months later, that summer, 3 animals on the family's farm were diagnosed with visible abscesses around the neck and another 2 animals were losing weight in the fall. The herd veterinarian visited the flock and diagnosed the 5 affected animals with **Caseous Lymphadenitis (CL).**

HIGHLIGHT THE ACTIONS THAT PUT THE INDIVIDUAL ANIMALS AT RISK AND THEN THE HOME HERD AT RISK.

1. *Taking sheep to a neighbouring farm and penning them so that nose-nose contact was allowed*
2. *Borrowing out their clippers*
3. *Immediately reintroducing the sheep into the home flock*

WHAT COULD THE FAMILY HAVE DONE TO PROTECT THEIR TRAVELLING ANIMALS FROM CONTRACTING CASEOUS LYMPHADENITIS (CL) AND INFECTING THE HOME FLOCK?

• Ideally the animals should not have left the farm, but this is not always a practical management practice for sheep producers in Alberta. It is best for producers to understand travelling animals are at a higher risk of contracting disease and introducing it to the home flock.
• They should then manage that risk to keep their travelling animals and home flock healthy.
• Pen the sheep so there is no contact with sheep or equipment from other premises.
• Clean and disinfect the clippers when they have been returned from the neighbours, prior to going home and/or using them on their own sheep.
• Segregate any sheep that have travelled away from the home premise for 3 weeks to monitor for signs of disease before reintroducing them to the home flock.

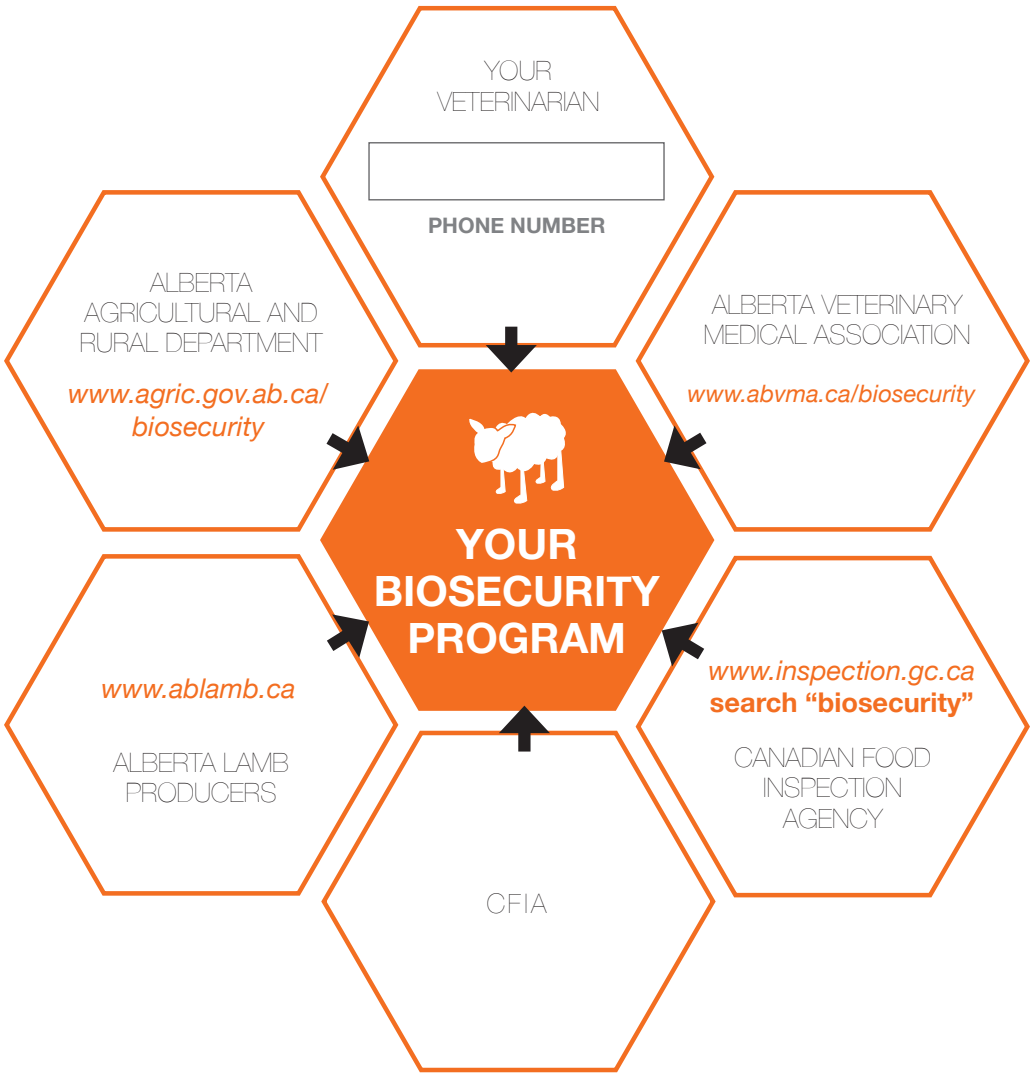


Each operation and disease will have specific risk management procedures that producers can implement. Determine what those risk management procedures are and if they are practical for your operation. Consult your veterinarian for assistance.

THERE IS HELP AVAILABLE

Your veterinarian is the best source of information and guidance to protect your investment in your operation. They can guide you through a risk assessment to determine risks and threats specific to your operation. Following a risk assessment, you and your veterinarian will be able to identify key areas of improvement in your efforts for disease prevention and control. Areas for consideration include: Access Management, Animal Health Management and Operational Management. Specific protocols relevant to each area will help you protect the health and wellness of your animals, family and community.

For additional information on biosecurity practices or to access a variety of free resources visit:



RISK ASSESSMENT CHARTS[4]

Complete the following charts with your veterinarian to identify areas you may wish to increase your efforts of disease introduction, transmission and spread.

SECTION A: ANIMAL RISK FACTORS

DO YOU:	YES/ ALWAYS	SOMETIMES	NO/ NEVER	COMMENTS/ ACTION POINTS
Operate as a closed herd?				
If no, do you:				
Identify zones that are closed to public access?				
Breed by live cover?				
Breed by Artificial Insemination (AI)?				
Isolate new sheep for 3 weeks?				
Isolate clinically sick animals?				
Use separate pens for lambing and sick animals? If yes:				
Clean and disinfect lambing pens between births?				
Clean and disinfect sick pens/crates between animals?				
Follow a veterinarian reviewed vaccination program against specific diseases of concern? If yes:				
Vaccine program documented?				
Have a health record for each animal? If yes:				
Document medications, vaccines and dewormer given, when and by whom?				
Record normal vitals for each sheep (HR, RR, Temp)				

4 *Adapted from the* ***Ontario Veterinary Medical Association Biosecurity*** *Initiative Final Report*

DO YOU:	YES/ ALWAYS	SOMETIMES	NO/ NEVER	COMMENTS/ ACTION POINTS
Document all incidences of illness to monitor for trends?				
Follow a veterinarian reviewed dewormer program? If yes:				

SECTION B: FEED AND WATER RISK FACTORS

Take measures to ensure that the main feed supply cannot be contaminated with manure?				
Restrict manure application to field crops?				
Take measures to limit exposure of feed supply to rodents, pets and/or wildlife?				
Clean and disinfect waters between herds?				
Practice sanitation to minimize contamination of livestock waters by manure and/or urine?				
Is the source of livestock drinking water:				
Untreated surface water?				
Ground water?				
Treated surface water?				
Municipal water?				
Irrigation Water?				

SECTION C: OWNER AND EMPLOYEE RISK FACTORS

Work with animals youngest to oldest?				
Work with sheep from healthy to sick?				
Clean and disinfect equipment between animals or groups of animals housed separately?				
Use equipment for single purposes? E.g. shovel for manure, different one for clean bedding				
Change, disinfect boots or use disposable boot covers boots when working with neonate lambs?				

DO YOU:	YES/ ALWAYS	SOMETIMES	NO/ NEVER	COMMENTS/ ACTION POINTS
Put on or change outwear and footwear before working with sheep in isolation, sick pens or quarantine?				
Change to clean outwear and disinfect footwear after working with sheep in isolation, sick pens or quarantine?				
Wear footwear and outerwear specific to that barn/operation/farm?				
Have access to or know where the barn/ operation/farm biosecurity protocols are documented?				
Understand and comply with the biosecurity protocols?				

SECTION D: FACILITY USER AND VISITOR RISK FACTORS

Have a visitor log book in plain view of the main entrance that would be used by visitors?				
Require all visitors to sign the visitor log at each visit?				
Post biosecurity protocols in plain sight for visitors to read, understand and follow?				
Have posted protocols that include a name and contact information for visitors to be directed to for clarification?				
Restrict visitors from entering the barn and outbuildings prior to contacting management?				
Provide hand washing stations?				
Provide visitors and farm service workers with clean boots, and/or outwear?				
Have a designated, signed parking area for visitors, and employees?				
Post a diagram of farm/barn layout clearly identifying access zones?				
Understand and comply with the biosecurity protocols?				

SECTION E: PREMISE RISK FACTORS

DO YOU:	YES/ ALWAYS	SOMETIMES	NO/ NEVER	COMMENTS/ ACTION POINTS
Keep animals from different sites or zones separate at all times?				
Return animals to the farm that have left the premise? If yes:				
Isolate those animals on return?				
Ensure they are fully vaccinated?				
Ensure any sheep that may come into contact with them are compliant to the vaccine policy?				
Clean and disinfect truck and trailer after returning?				
Have regularly positioned and maintained hand washing stations?				
Soap and water?				
Waterless hand washing agents?				
Encourage hand washing between animal contacts?				
Make available and maintain boot washes?				
Near main entrances?				
Outside isolation stalls/pens?				
Outside quarantine stalls/pens?				
Outside lambing pens?				
Require dedicated footwear?				

BIOSECURITY DEFINITIONS

BEST PRACTICE: Best practices are a program, process, strategy, or activity that has been shown to be effective in the prevention of disease transmission; is based on current information; Is of value to, or transferable to, other operations.

BIOCONTAMINENT: Keeping disease causing pathogens inside a particular area to avoid contaminating other animals, equipment, premises etc.

BIOEXCLUSION: a set of practices used to minimize the introduction of pathogens and pests in animal and plant populations into specific pathogen free (SPF) herds/ facilities, breeding facilities or other such operations.

BIOSECURITY: a set of practices used to minimize the transmission of pathogens and pests in animal and plant populations including their introduction (bioexclusion), spread within the populations, and release (biocontainment)

CLOSED HERD: A herd the does not introduce new animals on a regular basis; maintains its own breeding stock; is isolated from direct contact with other same species herds, flocks etc.; introduction of new animals follows a strict quarantine and observation period which may include diagnostic testing to determine health status.

CONTACT TIME: A specific amount of time, identified by manufacturers, required by disinfectants to adequately disinfect or sterilize a surface; may vary with concentration, temperature, presence/absence of organic matter.

DECONTAMINATION: the process that removes microorganisms from an object, rendering it safe for handling; the process of cleaning, followed by the inactivation of pathogenic microorganisms, in order to render an object safe for handling.

DISINFECTANT: a chemical agent used on inanimate objects to destroy virtually all recognized pathogenic microorganisms, but not all microbial forms (e.g. bacterial spores).

DISINFECTION: a process that kills most organisms but rarely kills all spores; a process that kills most forms of microorganisms on inanimate surfaces; 3 levels of disinfection are low, intermediate and high.

FOREIGN ANIMAL DISEASE (FAD): a disease not normally found in Canada; federally and provincially reportable by a veterinarian or diagnostic lab immediately upon suspicion or confirmation of presence in animal(s).

INFECTIOUS AGENT: microorganism capable of causing disease in humans; infectivity is affected by the organisms' viability, virulence, invasiveness and pathogenicity.

MODE OF TRANSMISSION: the method whereby the organisms are transmitted from one place to the next. Examples may be by direct contact, indirect contact with a contaminated body substance, vectors, and fomites (contact with inanimate objects carrying infectious disease).

PATHOGEN: something that can cause disease; e.g. bacteria, virus, toxin

PERSONAL PROTECTIVE EQUIPMENT (PPE): Specialized equipment or protective clothing used to protect oneself from direct exposure to blood, tissue or body fluids; may include gloves, gowns, fluid-resistant aprons, head and foot coverings, face shields or masks, eye protection, and ventilation devices (e.g. mouthpieces, respirator bags, pocket masks).

PREMISE: an area of land where recordable animals are bred, kept, raised, displayed, assembled or disposed of.

RESERVOIR: a source that allows for microbial growth and multiplication; examples include people, equipment, and materials.

SANITIZE: a process that substantially reduced the bacterial count without eliminating all microbial forms.

STERILIZATION: a process that kills all microorganisms, including bacteria, viruses, spores and fungi.

SUSCEPTIBLE HOST: a person or animal who lacks the immunity or resistance to the invasion of the body and reproduction by the microorganisms, resulting in infection.

ZOONOTIC DISEASE: disease caused by viruses, bacteria, parasites and fungi that are transmitted from animals and insects to humans and can cause human disease. E.g. Orf, Salmonella ssp.