Biosecurity Best Practices

Pocket Guide

for Alberta Goat Breeders

presented by

Alberta Goat Breeders Association

Biosecurity...doing small things right everyday to positively influence animal health, food safety and public health.

Canada

Government of Alberta

Growing Forward
A federal-provincial-territorial initiative

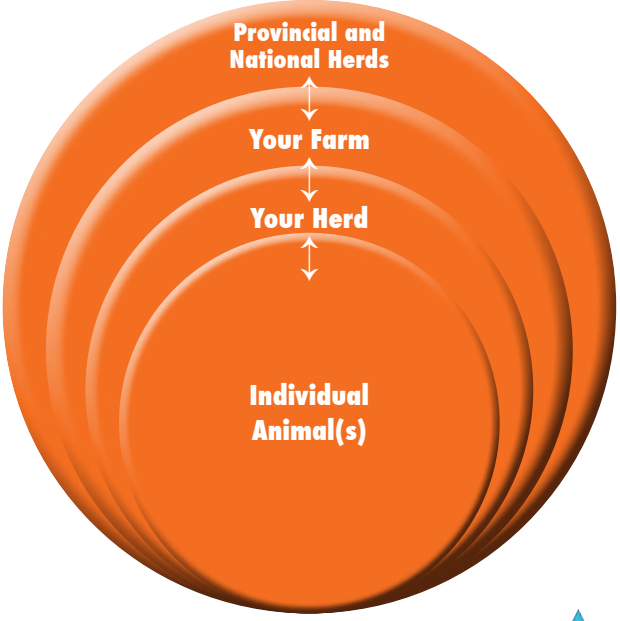
Biosecurity Pocket Guide

Contents

What is Biosecurity?

Biosecurity is 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 an animal, herd, and farm against biological agents that can cause disease. It is a strategy of prevention; prevent introduction of disease and prevent recycling disease. It is a set of practices and principles that guide management practices to protect livestock from pathogenic organisms.



Why are biosecurity protocols important and how can you benefit?

- Prevent financial losses from animal illness
- Promote economically strong operation and industry by preventing introduction of disease
- Biosecurity supports sustainable agricultural and represents good business
- Increase the competitiveness of your product
- Reduce and eliminate diseases on your own farm and in your industry

Sick animals have a slower weight gain rate, produce less and treatments cut into profits. A dead animal represents lost present and future income.

- Minimize the risk of introduction of a Foreign Animal Disease (FAD) which could be economically devastating to you and the livestock community locally, provincially and nationally

The appearance of a FAD on Canadian soil, in just one herd or flock, could immediately shut down entire segments of our livestock industry and be devastating to animal welfare, our economy and our present agricultural society.

What are YOUR animals at risk of contracting?

The following diseases are *some* of the diseases your goats are at risk of contracting and spreading.

Anaplasmosis is an infectious, non-contagious disease caused by *Anaplasma ssp.* that can affect humans or ruminants, including cattle, bison, sheep, goats, deer and elk. **Nationally Reportable and Provincially Notifiable**[1].

Anthrax: A **zoonotic** disease that is caused by the spore forming bacteria Bacillus anthracis that commonly lives in the soil.

Caseous Lymphadenitis: Characterized by abscessing lymph nodes and internal organs caused by *Corynebacterium pseudotuberculosis*. Spread by contact with the bacteria living in the pus which can be carried on equipment, living quarters, soil, and apparently healthy animals.

A goat with an abscess.

Clostridiums are a constant threat to animal producers because the bacteria are common in the soil and in the intestinal tract of animals. Animals may acquire infection by ingesting the bacteria or from a wound that gets contaminated. Clostridial diseases include:

a. **Blackleg:** An acute, fever-causing disease of cattle and sheep caused by *Clostridium chauvoei (feseri)* characterized by swelling, usually in the heavy muscles. It is found worldwide.

[1] 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.

b. **Tetanus:** Also known as Lockjaw, *Clostridium tetani* causes a toxic infection that can affect goats. May enter an animal by soil getting into a wound. High risk is following castration or docking in sheep and other animals including goats.

c. **Clostridium perfringens Type C & D:** A bacteria normally found in the intestinal tract of animals, overgrowth causes bloody diarrhea and destruction of the intestinal tract.

Foot and Mouth Disease: Not present in Canada and therefore a **Foreign Animal Disease (FAD)**. A highly contagious viral disease of cloven hoofed animals that is passed by direct or indirect contact with infected animals or by food products. Poses a **huge economic risk** if this disease enters Canada. Nationally and Provincially Reportable.

A Foot and Mouth lesion on the tongue of an infected cow.

Foot Rot[2]: A bacterial infection of cloven hooved animals where the horny part of the hoof separates from the tissue underneath causing lameness and an opportunity for secondary infection.

Preventable by employing biosecurity recommendations for visitors, new animals, facility and equipment use!

Employ good hand washing techniques!

A goat with foot rot.

2 Foot Rot; Pennsylvania University Agricultural Sciences; http://bedford.extension.psu.edu/agriculture/goat/Goat%20Foot%20Rot.htm

Goat and Sheep Pox[3]**:** Not present in Canada and must be differentiated from Orf. Call your veterinarian to assist in diagnosis. Nationally Reportable.

Pox lesions on the lips of an affected sheep.

Johne's disease: Also known as paratuberculosis, this is a chronic wasting disease, caused by *Mycobacterium paratuberculosis* that affects the intestines of all ruminant animals, including cattle, sheep and goats. Provincially Notifiable

Listeria: Also known as the "Circling Disease", *Listeria monocytogenes* cause septicemia, abortion, and latent infection. The organism is widespread in the environment and outbreaks may occur following feeding poor quality silage.

Orf: Contagious ecthyma is a highly infectious viral disease, which causes crusty, pustular lesions on the muzzle and lips. Zoonotic. Wear gloves!

A goat with with Orf lesion at the corner of its mouth.

A man's arm with an Orf lesion.

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

Rabies: A highly fatal viral infection of the central nervous system, which can affect all warm blooded animals. It is transmitted by the bites of infected animals. It appears with motor in coordination, mania and aggressive behaviour, inability to swallow and progressive paralysis. Handle all suspect animals with **extreme** care and caution. Nationally Reportable.

Salmonellosis: Can result in serious clinical disease and animals with Salmonella ssp. are a reservoir for disease causing agents in human. Disease often has symptoms of gastrointestinal infections, zoonotic; Provincially Notifiable.

Scrapie: Scrapie is a fatal disease that affects the central nervous system of sheep and goats. Nationally and Provincially Reportable[4].

Scrapie. Incoordinated gait, twitching of muscles and wild expression in the eyes.

How do YOU start an effective biosecurity program?

There are two equally important steps to establishing an effective biosecurity program specific to your animals and operation. Each step adds value, relevance and understanding to a biosecurity program.

Step One: 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?

What diseases are you concerned about?

What *should* you be concerned about?

What are you already doing to limit your risks of disease in your goats?

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

Biosecurity programs should be developed specific to each goat, herd, goat owner's and/or facility's individual needs. **The most effective way to evaluate need is to participate in a risk assessment survey of risk factors with your veterinarian.** During a risk assessment, you and your veterinarian 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

Sample risk assessment charts are included at the end of this guide and are also available at **www.abvma.ca**, on the Alberta Veterinary Medical Association's Public Resources page.

After completing a risk assessment survey, goat 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 is:

_____

_____

Veterinary Clinic name and phone number:

_____

_____

_____

Use this space to make a list of questions for your veterinarian or to keep notes as you participate in a risk assessment with your veterinarian.

Step Two: Implement Risk Management Strategies

Recommendations from the risk assessment are aimed at managing the risks of concern for your *farm and operation*. The remainder of this pocket guide details recommendations to manage all risk associated with owning, producing and caring for animals. Recommendations are categorised based on the three pillars of disease prevention and control.

You should make educated decisions about which of the following tips to adopt into your everyday operational practices. Your veterinarian is a valuable resource to ensuring the health, wellness and value of your animals. Use them!

Develop your personalised **biosecurity** program using the 3 management pillars of biosecurity.

- Access management
- Animal health management
- Operational management

Access Management

Control Access to Farms and Barns at Critical Points

- Post biosecurity signs at barn and pasture entrances
- Establish zones to reflect differing levels of biosecurity protocols in place. Zones may include:
  - → Controlled Access Zone
  - → Restricted Access
  - → Quarantine
  - → Isolation
- **Restricted access** zones should be any area/pasture/pen where animals commonly reside

- 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.
- Quarantine should be used for new animals to monitor for disease status before being introduced to main herd (especially important for closed herds); or may be used for animals that may be at risk of contracting disease, "compromised animals".
- Isolation should be used for sick animals and should have the highest level of biosecurity protocols in place they serve dual purpose, keep what's in, in and keep what's out, out.
- Disinfect delivery and supply trucks, transport trucks etc. before entering animal handling/living areas

Components of a Quarantine Area

The goal of a quarantine area is to ensure that an animal placed in quarantine does not put other animals at risk and to keep any pathogenic organism in that area and out of the rest of the farm.

1. Choose an area (pen, pasture, paddock) well away from where other animals are housed.
2. Eliminate direct or nose to nose contact with any other animals, including pets!
3. Have separate waterers, feed bins and buckets for quarantined goats.
4. Label equipment, including halter, shovel, bucket, etc., as QUARANTINE
5. Post signs outside of quarantine pens and stalls indicating quarantine status and restricted access.
6. Wash hands prior to going in and coming out of pens/stalls.
7. Clean and disinfect boots when exiting. Change outerwear.
8. Stock quarantine area with routinely used items. Clean and disinfect any equipment that leaves the quarantine area. Preferably don't let it out!
9. Use coveralls each and every time you enter quarantine. Ensure they are labelled. Wash separate from other laundry and at the end of the quarantine period.
10. Restrict facility use and animal movement of goats in quarantine until quarantine period is expired e.g. wash rack, arena, alleyway would be off limits, turn out with other goats.

Components of an Isolation Area

These are general guidelines. Consult your veterinarian to ensure you are practicing effective isolation practices.

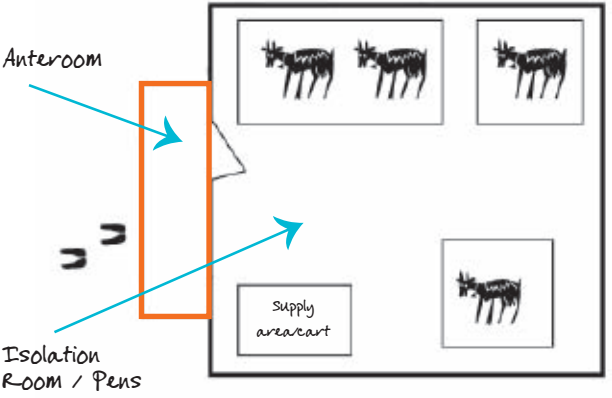
1. Choose an area removed from animal living and handling areas and high traffic routes. If isolation is a stall/small pen, have at the end of the row and with an empty stall/pen beside it.

2. Establish an anteroom or ante area before the main entrance to isolation. This area will be used to:
    a. Remove regular outwear,
    b. Don protective equipment (gloves, coveralls, etc.) and
    c. Remove PPE and disinfecting when exiting isolation.
3. Anything that goes into isolation stays in isolation. So stock isolation room with commonly used equipment (thermometer, stethoscope, disinfectant concentrate, measuring cups, pens, whiteboard to track information, buckets, feed bins, shovel, rake, broom etc.)
4. Disinfect equipment after each use.
5. Label equipment as ISOLATION to ensure it is easily identifiable in the room and in case it gets out!
6. Keep isolation equipment in a closed bin that you can easily disinfect.
7. Post signs outside of isolation pens and stalls indicating isolation status and restricted access. Signs are most effective if posted a bit away from the stall/pen versus directly on the stall.
8. Wash hands prior to going in and coming out of anteroom.
9. Have non porous (rubber) boots identified as isolation boots. Clean and disinfect them prior to going into isolation and upon exit from isolation. Consider using disposable booties also.
10. Have coveralls specifically for use in isolation. Strongly consider disposable coveralls.
    a. Label them and launder them after each use.
    b. Use a different pair each animal if they are from separate housing areas or have different diseases.

c. Keep a covered isolation laundry bin directly outside isolation. Wash isolation laundry with detergent and bleach. Wear gloves when transferring to washer. Remember to label the washer as isolation!

d. Keep clean ISOLATION coveralls in a closed bin outside the isolation area in the anteroom, for quick access.

e. Goats should not leave isolation until cleared by veterinarian as being safe to return to general population. All facility use is off limits to protect other animals in the facility and possible transmission of disease to the community.



A diagram of possible isolation set up. Notice the anteroom at the entrance to the isolation, great place for a crossover barrier. Animals with the same disease from the same herd may be housed together. A supply cart on wheels is especially useful. Access to water within the isolation or anteroom would be ideal.

Visitors Risks and Recommendations

Visitors, especially those providing your animal health services such as the veterinarian or shearer carry real risks for introducing disease to your herd. You can manage this risk by following some of the below recommendations:

- Advise visitors prior to their arrival on farm that there are biosecurity expectations in place and ask they report to the office or house before attending animal areas.
- Establish visitor parking well away from animal handling and living areas and post signs
- Ask visitors about recent travel, especially out of country. Use enhanced measures if visitors have travelled abroad in the last 2 weeks.
- Restrict visitor access to animals where possible.
- If contact is planned, have clean or disposable coveralls and boots for visitors to wear. This will limit the chance that any pathogenic organisms on their clothes or footwear will be passed to your animals.
- Keep a Visitor log book with date, name and any previous animal contact in the last 7 days

A visitor log or guest book can be used to track human movement in the event of a disease outbreak.

You as a visitor

If you are leaving your farm to visit another farm, apply visitor recommendations to yourself. Wear clean clothes and footwear to the visiting premise and launder clothes and disinfect footwear immediately upon return, prior to going to animal areas.

Animal Management

Plan animal movements to minimize risk of introduction, transmission or recycling of disease

- Maintaining a closed herd is a low risk situation
- Handle animals from youngest to oldest and healthy to sick as routine practice
- Avoid moving young or sick animals through a heavily used area
- Quarantine new animals prior to introducing them to the herd

Enhance animal segregation with additional biosecurity measures:

- Arrange pens or gates in a manner to be able to easily move animals without cross contaminating other living areas
- Regulate pedestrian and vehicle traffic and manure flow in direction and/or timing to reduce cross contamination and closeness to animals
- Limit equipment movement between pens, clean and disinfect thoroughly if unavoidable
- Ensure transport trucks are clean, disinfected and rinsed properly prior to loading animals 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 diagnosis action that may be taken and treatment protocols
- In conjunction with a veterinarian, develop a comprehensive vaccination program specific to your herd's risk
- Vaccinate all animals on the premise according to your veterinarian approved vaccination protocol

- **Quarantine** new animals until disease status is established and vaccinations are effective
- Place sick animals in **isolation** to avoid recycling disease in the flock

Vaccines and Vaccine Administration

Vaccines are an important part of a herd health program as they can aid in the prevention of disease. Vaccines do not always provide 100% protection but they will help to maintain your herd health by reducing the risks associated with diseases and help to avoid economic loss due to illness and death. The only vaccines that are currently licensed for use in goats include:

- *Clostridium perfringens* Type C & D (enterotoxemia disease)
- *Clostridium tetani* (tetanus)

Combination 7 or 8-Way Clostridial vaccines are labelled for cattle and sheep. The extra protection these vaccines provide is not often required on most goat farms. Other vaccines that are considered off-label for goats include contagious ecthyma (sore mouth or ORF), caseous lymphadenitis, *Chlamydia* (abortion), pneumonia, foot rot, and Rabies.

Subcutaneous administration of vaccines is preferred over intramuscular injections as there is less risk of site reactions and tissue damage. Injections are commonly given under the skin in the neck region with an 18 or 20 gauge needle. Always follow the manufactures' recommendations for withdrawal times to avoid residues in the meat and milk.

Following vaccine guidelines can help to minimize the risk of adverse reactions:

- The success of a vaccination program is dependent Develop a vaccine schedule with your veterinarian. Follow it or consult them before diverging or if circumstances change. AGBA Biosecurity Pocket Guide Page 20
- Read instructions provided with vaccines
- Never mix vaccines in the same syringe
- Do not use expired vaccines

- Disinfect vaccine site with 70% alcohol swab
- Use sterile needles
- Use new needles for each animal, for each injection
- Only vaccinate animals in good health
- Keep good vaccine records; include product, site of injection, animal ID, who administered, date of administration, date of required booster
- Properly dispose of needles and vaccine vials

The success of a vaccination program is dependent on choosing the right vaccines that protect against disease that your herd is at risk of contracting. The appropriate timing of initial vaccines and boosters, movement of animals, introduction of new animals all needs to be considered as well as the overall health of the herd. Contact your herd health veterinarian to further discuss developing a strategic vaccine program.

Operational Management

Clean and Disinfect Equipment and Barns

- Clean equipment prior to disinfecting
- Clean and disinfect equipment after use and prior to introduction to a new group of animals
- Wash vehicles regularly, and especially after visiting another farm, high pressure wash and disinfectant the under carriage and wheel wells
- Keep the interior cab of farm vehicles clean and free of dirty coveralls, boots or equipment. Disinfect regularly
- Avoid sharing equipment with other farms, purchase commonly used equipment and keep it in the barns to minimize disease introduction or transmission
- Follow manufacturer's directions when using commercial cleaning and disinfection products

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 add a layer of protection, but should NOT replace good hand washing. In the event you are handling sick animals, deceased animals or animals at high risk of contracting disease, like newborn kids, consider adding gloves to your barn cupboard. Many options are available at your veterinary clinic or local drug store, including latex, non powdered and vinyl (in fun colors too!).

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

Coveralls should be worn in specific zones, like isolation or quarantine. Identify these clearly and wash with bleach, separate from regular coveralls.

Footwear should be impermeable, easy to clean, with shallow treads. Deep treads hold 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.

Crossover barriers can be used in areas to remind producers, staff and visitors to change footwear. Easy to add into a barn entrance or at the entrance to a pen or pasture!

This entry system is ideal for use outside quarantine or isolation to identify the anteroom and provide a station for changing footwear and outwear.

A simple yet highly effective crossover area may be created using a bench and some 2 x 4 lumber. If outside, clean supplies could be kept in a lidded container.

Biosecurity recommendations for using personal protective equipment

Visitor donning disposable coveralls prior to animal contact.

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

- Consider using disposable booties and coveralls for use in isolation areas
- 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 residents. Leave germs at home.
- 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.

Control Pests with a Pest Management Program

Rodents and insects can act as a vector for animal diseases and parasites. Manage the risk they present:

- Build rodent proof barns, close entry ways for mice.
- Eliminate breeding and harbourage areas for insects and rodents.
- Use bait stations and be sure they are out of reach of pets!
- Fill holes where water can stagnate and become breeding grounds for insects
- Keep feed supplies in rodent proof containers, clean up feed spills immediately to eliminate food sources for rodents

A laneway stop sign indicates to suppliers and visitors' restricted access is in effect.

Communicate Biosecurity Program Effectively

- Use highly visible clear signage to post your biosecurity protocols
- Include biosecurity protocols in staff training and document employees completion of training
- 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
- Visitors should be accompanied by the producer or an employee at all times to assist in compliance with biosecurity protocols

Disease control and prevention efforts are only successful if everyone accessing animals is aware of the protocols in place and committed to maintaining standards.

Summary of Key Recommendations for Effective Biosecurity Programs

Access Management	Animal Management	Operational Management
• Understand your animals and farms risk • Control access to your farm and animals at critical points • Manage visitors' risk	• Plan animal movements to minimize introduction, transmission or recycling of disease • Monitor herd health • Quarantine new animals for 2-3 weeks	• Clean and disinfect equipment • Use PPE • Wash hands prior to and following animal contact • Control pests • Communicate your biosecurity program clearly & effectively

What is the easiest and cheapest way to protect your flock?

WASH YOUR HANDS!

Hand Washing

Practice good personal hygiene before and after handling animals or between groups of animals. 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:

Alcohol Based Gel

If hands are 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!

Antiseptic Soap and Water for if hands are visibly dirty:

To be effective, wash with soap and water for 30 seconds, then rinse.

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.
4. Use paper towel or towel to turn off taps and open doors to exit washrooms.

Cleaning and Disinfecting Tips

Keep in mind the following points when cleaning and disinfecting equipment, barns, pens, stalls:

- Keep all disinfectants out of reach of children. Read all labels thoroughly for Use, Direction, Safety Requirements and Toxological Information.
- Cleaning and Disinfection requires a protocol just as vaccination and medication programs
- Clean surfaces first! Organic material significantly reduces the activity of most disinfectants; Cleaning is the removal of dirt (organic material) that can protect and/or carry pathogens and FAD viruses.
- Document your cleaning record. 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. Consult your veterinarian for advice on disinfectants for specific diseases.
- Use warm or hot water to mix disinfectants as most disinfectants, detergents and soaps have increased activity in warm water.
- Label mixed up solutions with date of dilution, date of expiry, product name and concentration and initials.
- Remember disinfectants require **contact/exposure time**. Rinse thoroughly if indicated on directions.

More is not necessarily better. use the correct dilution of the correct disinfectant.

Selecting a Disinfectant

When selecting a disinfectant, keep in mind specific products effectiveness against the potential pathogenic agent, safety to people and animals, impact on equipment, the environment, and expense. **If you have a specific disease causing organism you are trying to control or eliminate, contact your veterinarian for specific recommendations that will be effective in disease control.**

Here are a few general tips:

1. Identify the job you want the disinfectant to accomplish.
2. Select a broad spectrum agent.
3. Select an agent that is non-irritating, nontoxic, noncorrosive and inexpensive.

In your review of disinfectants, look at each product's:

- Effectiveness in the presence of organic material (soil, manure, vegetation etc.)
- Effectiveness or ability to combine with other compounds such as soaps/detergents. May help if you can combine cleaning and disinfecting steps.
- Contact time and required temperature. Sufficient time and appropriate temperature, which is proportional to the degree of contamination, must be allowed for action of the disinfectant.
- Residual activity on fabric and metal. Especially important for determining when animals can be returned to an area.
- Cost. Keep in mind the concentration you need to use and the quantity of diluted product.

Reference Chart for Selecting a Disinfectant

Type	Products*	Uses*	Advantages	Disadvantages	Cautions*
Alcohols	AlphaDyne Plus (Chemi3); Relyon Disinfectant Spray (Dupont)	Skin Disinfecting	Rapid action, evaporate with little residue; Can be used for disinfecting instruments at 70-95% concentration	Fast evaporation reduces available contact time; Reduced activity in the presence of organic matter Not for use in sterilizing instruments/ equipment[5]	Avoid ingestion Fire hazard. Can be irritating to tissues
Aldehydes: Formaldehyde/ Gluteraldehyde	Formaline (Vétoquinol); Profilm® (Pfizer); Fumalyse II (Bio Agri Mix); Virocid ® (Merial)	Vapor-Phase Surface Disinfecting Fumigant	Good resistance to organic matter	Requires long contact times Loses effectiveness at low temperatures, at low pH and in the presence of compounds present in farm buildings which make it a poor product for general use livestock disinfection Environmental hazard	Eye and skin irritation. Poisonous if inhaled.

[3] Does not constitute an endorsement or guarantee effectiveness of product.

[4] Consult a professional for recommendations for specific purposes.

[5] Read all warning labels. Follow manufacturer's directions.

[5] According to Association for Professionals in Infection Control and Epidemiology

Type	Products	Uses	Advantages	Disadvantages	Cautions
Hypochlorites	BioSentry™ Chlor-AFoam ™(Pfizer); Javex® (Colgate- Palmolive)	For the cleaning and disinfection of hard non-porous environme nt surfaces	Virucidal; biodegradable Low Cost Rapid Effectiveness against range of organisms at low concentrations.	Do not mix with other disinfectants. Do not use with acid cleaner. Poor activity in presence of organic material.	Irritating to eyes, skin and mucous membranes. Vapours are irritating. Corrosive.
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. Color change an indication of decreased effectiveness	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.

Type	Products	Uses	Advantages	Disadvantages	Cautions
Oxidizing Agents	Virkon (Vétoquinol); Hyperox (Vétoquinol)	Cleaning and disinfection of surfaces and equipment. Aerial disinfection Sanitizing drinking water system Footbaths	Biodegradable Valuable as cleaning and deodorizing agent	Ineffective in the presence of organic matter. Limited residual activity. 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); Beaucoup (Ecolab Healthcare); LpH ag® (Steris); Multi- Phenolic Disinfectant (Bio Agri Mix); Environ LPH; Pine-sol	Simultaneo us cleaning, disinfection and deodorization. Footbaths	Not affected by hard water, residue activity, good storage life; Effective in presence of some organic material, Compatible with many soaps/ deterg ents and in hard water; 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

Type	Products	Uses	Advantages	Disadvantages	Cautions
Quaternary Ammonium	BioSentry™ 904™ (Pfizer); Clinicide (Bimeda- MTC); Coverage 256® (Steris); Pro-quat® (Pfizer); Quatsyl®-D Plus (Pfizer); Rocco (Véto-quinol)	Good general disinfection of surfaces animal buildings and equipment.	Effective at high pH and temperatures; Stable com-pounds - very good storage life; Many are biodegradable; Effective over wide pH range. Detergent and residual activity Low cost	Inactivated in organic matter, hard water and by many soaps/ detergents	
Peroxide	Peroxigard™ (Bayer), acceler-ated hydrogen peroxide Virox 5 (Virox)	Sanitizing and disinfecting in veterinary hospitals and animal care facilities.	Sanitizing contact time 30 seconds Disinfecting contact time 1-5 minutes[6]	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 protec-tive clothing. Do not store in food processing areas. Avoid storage at elevated temperatures.
Chlorhexidine	Hibitane Nolvasan, Chlor-hex, Chlorasan, Virosan	Sanitizing and disinfecting of hard non porous surfaces; Skin cleanser	Relatively non-irritating to tissues Some effectiveness in organic matter Some residual activity Effective at low concentra-tion Low cost	Reduced effectiveness in hard or alkaline water Less effec-tive than other disinfectants Re-quires frequent application	Non toxic

[6] Cleaning and Disinfecting Protocol for Animal Kennels, Cages and Exam Rooms http://www.virox.com/msds/pdf/AnimalKennelsCagesandExamRoomsCanada.pdf

Cleaning and Disinfection Protocol: Sample

Here is a sample cleaning and disinfection protocol that may be modified to fit your own use and facility. This protocol may be applied to chute system, rails, pens, stalls, stocks, squeeze, walls, doors and non porous floors to clean and disinfect. Written protocols are especially useful for employees or other people who may care for your animals.

1. The floors will initially be scooped and free of fecal material. Fecal material will be transported by wheel barrel to identify area where uncontaminated animal waste is to be deposited; ideally compost area. Floors should also be swept.
2. The animal housing/treatment area such as chute system, rails, chutes, and walls, doors and floors should be sprayed and cleaned using a dilution device such as a pressure washer with hot water and detergent (such as Nutrafoam or Sunlight). The area should be generally scrubbed and washed and free from any gross contaminant.
3. The area should be left to dry. If area use is continuing within the same day, the area should be squeegied in order to remove as much water as possible.
4. The following day, after drying – the area should be completely covered in disinfectant solution (such as Virkon 1%, which is a broad spectrum disinfectant; virucidal, bactericidal and fungicidal activity); also using a dilution device, such as a Hydrofoamer, and then allowed to dry before using.
5. If time does not allow for complete drying before applying disinfectant solution, squeegee as much water as possible to the drain; apply disinfectant and allow a minimum contact time of according to manufacturer's directions. (Virkon 1% is 15 minutes) After this, if the area is needed; the Virkon may then be squeegied off.

Biomedical Waste Disposal

Biomedical Waste Definition

Biomedical waste refers to waste that is generated by:

- Human or animal health care facilities;
- Medical or veterinary research and teaching establishments;
- Healthcare teaching establishments;
- Clinical testing or research laboratories; and,
- Facilities involved in the production or testing of vaccines

The following are animal biomedical waste:

a) Animal Waste: consisting of all animal tissues, organs, body parts, carcasses, bedding, fluid blood and blood products, items saturated or dripping with blood, body fluids contaminated with blood and body fluids removed for the diagnosis or removed during surgery, treatment or necropsy, **unless a trained person has certified that the waste does not contain a Risk Group 4 virus and/or agent**; excludes teeth, hair, nails, hooves and feathers.

b) Waste Sharps: clinical and laboratory materials consisting of needles, syringes, blades or laboratory glass capable of causing punctures or cuts.

Storage and Disposal of Biomedical Waste

Every worksite, including farms, that produces biohazardous waste, handles it, disposes or sends it away for disposal should establish written procedures to ensure proper and safe disposal. Alberta Health recommends the following procedures for biomedical waste:

- Segregate, label and colour code waste at the point of generation;
- Keep manual handling of waste to a minimum;
- Securely close all packaged waste before moving;

Storage[7]

Waste should be stored in designated waste storage facilities in accordance with the Public Health Act Waste Management Regulations.

- Be constructed of durable and impervious materials that will permit effective cleaning and disinfecting;
- Be constructed in a manner that will prevent the entry of pests and vermin;
- Be designed to contain spills;
- If refrigerating or freezing waste, should use a lockable, closed cold storage facility or a lockable, domestic type freezer unit.
    - → Use only for biomedical waste
    - → Display biohazard symbol
    - → Identify as "Caution: Biomedical Waste"
    - → Use caution when freezing waste containing glass or plastic containers as they may fracture at lowered temperatures

You can purchase medical sharps containers from your local pharmacy or veterinary clinic. These are clearly identifiable and meet the requirements of law and human safety. Alternatively, used clean bleach or detergent bottles can be used. Be sure they are well labelled and have a lid that closes securely. To dispose of containers, contact your local veterinary clinic or pharmacy to inquire about acceptance. Or your local landfill to inquire about acceptance and requirements for disposing at the landfill. There may be a charge and/or specific hours for drop off.

[7] Guidelines for the Management of Biomedical Waste in Canada by CSA; February 1992

Dead Animal Handling and Disposal

Livestock and animal deaths may occur no matter how well an operation is managed. Disposing of dead animals quickly and effectively is important to reduce the risk and spread of disease. Carcasses can be a source of disease if scavenged by wildlife or pets. Some of these diseases can then be passed back to livestock or even humans. Carcasses are also unsightly, odorous and a breeding site for flies.

The choices for disposal under Alberta Agriculture's Livestock Diseases Act – Destruction and Disposal of Dead Animal Regulation are:

- burial
- incineration
- composting
- rendering
- natural disposal (except for animals that have been euthanized with drugs and chemicals or if the animal is known or suspected to have died from an infectious or reportable disease)

The dead animal should be disposed of within 48 hours of death. However, the dead animal may be stored for more than 48 hours if stored:

a. less than a week in an enclosed structure with impervious walls and floors that have been constructed for the storage of dead animals

b. outside during winter when the temperature is low enough to keep the dead animal completely frozen

c. in a freezer

d. in accordance with the directions of an inspector appointed under the Health of Animals Act or under the Livestock Diseases Act

Burial[8]

Bury deceased animal promptly to control odour, insects and scavenging. Screen the burial pit area from view with trees, shrubs or fences, and locate it some distance away from livestock and other farm areas.

Destruction and Disposal of Dead Animals Regulations contain the following guidelines for burial:

- The pit must be:
  - → 100 m (328 ft) from wells, waterways and high watermarks of lakes
  - → 25 m (82 ft) from the edge of a coulee, major cut or embankment
  - → 100 m (328 ft) from any livestock facility, including pastures that are not owned or leased by the owner of the animal
  - → 100 m (328 ft) from a residence
  - → 300 m (984 ft) from a primary highway
  - → 100 m (328 ft) from a secondary highway
  - → 50 m (164 ft) from any other road
- Apply quicklime to the carcass in sufficient quantities to control flies and odour.
- The pit must be covered with:
  - → minimum of 1 m (3 ft) of compacted soil
  - → wooden or metal lid that is designed to exclude scavengers
- The bottom of the pit must be at least 1 m (3 ft) above the seasonal high water table.

[8] For more information, refer to Alberta Agriculture, Food and Rural Development's Livestock Mortality Burial Techniques document (Agdex 400/29-2)[8].

Incineration

The *Destruction and Disposal of Dead Animal Regulation* state that dead animals may be disposed of by incineration on your property. However, this practice must follow the Substance Release Regulation or the Code of Practice for Small Incinerators available from Alberta Environment.[9]

Contact your veterinarian to inquiry cremation services and/or local crematoriums that may be able to assist you.

Composting

Composting carcasses is an effective way of disposal and can be done in a bin system designed for composting, in a windrow system or open compost pile. Examples of bin designs are available in Alberta Agriculture, Food and Rural Development's Swine Mortality Composting and Poultry Mortality Composting documents (Agdex 440/29-1 and Agdex 450/29-1).

Rendering

Dead animals must be picked up by rendering plants within 48 hours of death; until then, the carcass must be stored. When storing carcasses:

- Locate the storage area close to the entrance of the farm to minimize the need for collection vehicles to enter the property
- Use an area that will minimize the spread of disease — for example, do not store the carcass near a waterway or water body or where it will be easily scavenged
- If not picked up within 48 hours, use special storage bins or refrigeration until the carcass is taken to a rendering facility

[9] Small Incinerators Codes of Practice (EPEAact);
http://www.qp.alberta.ca/documents/codes/INCINERATORS.pdf

Natural Disposal

Natural disposal refers to disposal by scavenging and sites must be located well away from farm areas, water bodies and sources. It is best to dispose of these animals under the direction of a veterinarian, if the animal is:

- Known or suspected to have died from a reportable disease
- Known or suspected to have died an infectious disease that can be spread by scavengers or insects, or
- Was euthanized by a veterinarian using pharmaceutical agents

Any animal that was euthanized by a veterinarian, using veterinary drugs, must be buried immediately or stored for a maximum of 48 hours and protected from scavengers prior to disposal. Burial and incineration are the only acceptable means of carcass disposal following euthanasia. Carcasses pose a real and significant risk to pets, wildlife, and other animals if consumed.

Where can you get help?

Your herd health veterinarian is the best source of information to help you develop personalized biosecurity programs following on farm risk assessments.

Contact your veterinarian today to make effective production decisions to increase your economic viability and minimize your risk of loss from a disease outbreak.

For additional information on biosecurity practices and to access a variety of free resources, visit the Alberta Veterinary Medical Association Public Resources website, **www.abvma.ca**, and websites the partners in animal health:

Biosecurity requires a plan with regular review by a veterinarian.

Biosecurity Definitions

Antiseptic: chemicals used to inhibit or prevent the growth of microbes on living tissue.

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).

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

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.

FAD: Foreign Animal Disease; 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).

Nationally Reportable: Those diseases which 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.

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.

Provincially Notifiable: Notifiable Diseases are those which simply require monitoring for trade purposes, or to understand their presence in Alberta. No actions will be taken. 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. 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 inactivates or 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.

Conversion Charts for Quick Reference

Abbreviations

Tsp	Teaspoon
Tbsp	Tablespoon
mL	Millilitre
c	Cup
oz.	Ounce
lb	Pound
g or gr	Gram
kg	Kilogram
gal.	Gallon
fl.	Fluid
°C	Celsius
°F	Fahrenheit

Weight and Capacity Conversions

To Metric		U.S.
1/5 tsp	1 mL	
1 tsp 5	mLs	
1 tbsp	15 mLs	
1/5 c	50 mLs	
1 c 240	mLs	
2 c	470 mLs	1 pint
4 c	950 mLs = 0.95 litres	1 quart
4 quarts	3.8 litres	1 gallon
1 fluid oz.	30 mLs	28 grams
1 lb		454 grams
1 kg	2.2 lbs	35 oz.

Notes

Risk Assessment Charts[1]

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**	**Some-times**	**NO / Never**	**Comments / Action Points**
Operate as a closed herd?				
If no, do you:				
Isolate new goats for 2-3 weeks?				
Identify zones that are closed to public access?				
Breed by live cover?				
Breed by Artificial Insemination (AI)?				
Isolate new goats for 2-3 weeks?				
Isolate clinically sick animals?				
Use separate pens for kidding and sick animals? If yes:				

[1] Adapted from the Ontario Veterinary Medical Association Biosecurity Initiative Final Report

Clean and disinfect kidding 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 goat (HR, RR, Temp)				
Document all incidences of illness to monitor for trends?				
Follow a veterinarian reviewed dewormer program? If yes:				
Document dewormer program?				
Have effectiveness of deworming policy tested regularly with fecal floats?				

Section B: Feed and Water Risk Factors				
Do you:	**YES / Always**	**Some-times**	**NO / Never**	**Comments / Action Points**
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				
Do you:	**YES / Always**	**Some-times**	**NO / Never**	**Comments / Action Points**
Work with young animals before oldest?				
Work with goats healthy before 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 kids?				
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 goats in isolation, sick pens or quarantine?*				
Wear footwear and outwear 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				
Do you:	**YES / Always**	**Some-times**	**NO / Never**	**Comments / Action Points**
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 plian 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 handwashing 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**	**Some-times**	**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 goats 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 kidding pens?				
Require dedicated footwear?				

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A federal-provincial-territorial initiative

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