BC Poultry Biosecurity Reference Guide

BC POULTRY Association

BC EGG MARKETING BOARD

BC Chicken Marketing Board

BC TURKEY

BC Hatching eggs

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BC Poultry Association

Ray Nickel, BC Turkey Growers' Association, BCPA Chair
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BC Poultry Biosecurity Committee

Calvin Breukelman, BC Broiler Hatching Egg Producers', Chair.
Allen James, BC Poultry Association
Ken Falk, BC Specialty Bird Producers' Association
Rick Thiessen, BC Chicken Growers' Association
Dion Wiebe, BC Broiler Hatching Egg Producers' Association
Steve Heppel, BC Turkey Growers' Association
Derek Janzen, BC Egg Producers' Association
Chris den Hertog, BC Broiler Hatching Egg Commission
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Ron Kilmury, BC Chicken Marketing Board
Angela McKee, BC Broiler Hatching Egg Commission
Dr. Neil Ambrose, BC Processors' Association

BC Poultry Biosecurity Technical Sub-Committee

Calvin Breukelman, BC Hatching Egg Growers' Association, Chair
Dion Wiebe, BC Broiler Hatching Egg Producers' Association
Steve Heppel, BC Turkey Growers' Association
Ron Kilmury, BC Chicken Marketing Board
Peter Whitlock, BC Egg Marketing Board
Elise Legendre, Agriculture and Agri-Food Canada
Dr. Dan Schwartz, Canadian Food Inspection Agency
Dr. Merv Wetzstein, BC Ministry of Agriculture and Lands
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Preface

This Reference Guide has been developed as an information resource to assist poultry producers in developing biosecurity plans for their farming operations. Biosecurity planning and implementation reduces the risk of infectious disease transfer within and among poultry flocks. Enhancing your farm's biosecurity protects both your economic interest and that of the industry. Furthermore, it reduces the risk to public health that may result from certain poultry diseases.

This Guide provides current information on a variety of biosecurity related practices. It includes references to legislative requirements, details about beneficial biosecurity practices, a glossary of terms and sources of further information.

The BC Poultry Biosecurity Reference Guide is part of the BC Poultry Biosecurity Program. The Program provides producers with the opportunity to plan and implement biosecurity practices that meet the mandatory biosecurity standards required by the relevant Boards and Commissions. The Reference Guide is intended to be used in conjunction with the Poultry Biosecurity Planning Workbook. The Planning Workbook provides a step by step process for producers to evaluate their on-farm biosecurity. With funding assistance from the program, producers can correct identified deficiencies prior to completing a biosecurity audit and receiving biosecurity certification.

The BC Poultry Biosecurity Program builds upon companion programming delivered through the BC Agriculture Council's Environmental Farm Program. Planning Advisors knowledgeable about both programs are available to assist poultry producers in undertaking and implementing either or both programs.

The BC Biosecurity Program is an industry led initiative that is supported by the federal government, the provincial government and the provincial poultry boards and commissions. The BC Poultry Association, in conjunction with its partners encourages producers to take full advantage of the opportunities the program offers. Doing so will demonstrate your commitment to help protect your farm future and the health of the poultry industry in British Columbia.

Sincerely

Ray Nickel
President, BC Poultry Association

Calvin Breukelman
Chair, BC Poultry Biosecurity Committee

Limits of Liability

The primary purpose of the BC Poultry Biosecurity Reference Guide is to assist producers in developing a Biosecurity Program for their farms.

Every effort has been made to ensure the accuracy and completeness of this Guide but, the Guide should not be considered the final word on areas of practice that it may cover. You should seek the advice of appropriate professionals and experts as the facts of your situation may differ from those set out in this Guide.

All information in this Guide is provided entirely "as is" and no representations, warranties or conditions, either expressed or implied, are made in connection with your use of, or reliance upon, this information. This information is provided to you as the user entirely at your risk.

The Government of Canada or the BC Poultry Industry Biosecurity Committee, its directors, agents, employees, or contractors will not be liable for any claims, damages or losses of any kind whatsoever arising out of the use of, reliance upon, this information.

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For more information contact:
British Columbia Poultry Association

BC On-Farm Poultry Biosecurity Program

Garth Bean, PAg
Delivery Coordinator
604-854-0222
garthbean@look.ca

Niels Holbek, PAg
Program Coordinator
250-334-6547
nholbek@telus.net

Ron Bertrand, PAg
Program Coordinator
604-308-6755
rbertrand@shaw.ca

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Introduction

If you refer to a dictionary, you will not find a definition of the word *biosecurity*. The word *security*, however, is defined as "freedom from danger". So, what we have done is to coin a new word that can be defined as "freedom from danger represented by biological agents". The biological agents that present "danger" to the poultry industry are, of course, those microscopic organisms that include viruses, bacteria, and parasites. The viruses, bacteria, and parasites that we are concerned with are pathogenic organisms that require a host in which to grow and reproduce, particularly those that require the avian species as a host. The BC Poultry Biosecurity Program is a series of protocols that are designed to reduce the "danger" of biological agents to poultry flocks under our care.

When a bird is infected with a pathogenic organism, there may or may not be obvious signs of clinical disease. Nevertheless, that organism is reproduced in the bird then shed in greater numbers from the infected bird into the environment through body excretions, including feces, urates from the kidneys, or moisture droplets from the respiratory system. The organisms contained in these excretions contaminate the materials in the surrounding environment, which then carry the infection to the next bird. If the amount of the pathogen is high enough to overcome a susceptible bird's immune system, the bird becomes infected and the cycle continues. As the pathogenic organism passes through more and more birds, its numbers in the environment multiply rapidly.

Because pathogenic organisms are microscopic, they are not visible to the naked eye. Yet they can be found in large numbers in dust, in water droplets suspended in the air, and in visible fecal contamination. Enough pathogenic organisms to be an infective dose can be contained in an invisible amount of contaminated material. Such a small amount of contaminated material can be on equipment, clothing, footwear, or, even hands. By this means, the disease can be carried from one flock to another.

Humans face a common example of this principle of disease transfer daily. While we may assume that our hands are clean because we cannot see any evidence of contamination, they are, in fact, teeming with bacteria and viruses. Among those organisms can be the cold virus, picked up by simply shaking a person's hand, opening the door to the pharmacy, or handling a shopping cart. This is the most likely way in which we pick up that virus. The virus is then transferred to our respiratory tract as we put our hands to our face or eat our food. We then spread it to others through the droplets from our respiratory tract as we sneeze or cough and, of course then shake hands with someone, or go to the pharmacy for cold medication, or go shopping. If we were to design biosecurity standards to prevent ourselves from catching or spreading a cold, they would be:

1. *Frequently wash your hands*
2. *Keep your hands away from your face*
3. *Use a tissue when sneezing or coughing*

Biosecurity is not quite as simple when applied to poultry operations, but the fundamental principles are the same. In general we are trying to prevent or, at the very least, minimize the number of organisms entering and leaving the farm. Because we know that pathogenic organisms can leave and enter the farm carried on outer clothing, footwear, and equipment, to minimize this risk we set up two levels of defense. The first step is to define a secured area and implement procedures that prevent contamination from entering that secured area. Access to the secure area is limited to only those people and that equipment that is necessary. When it is necessary, controlled entry procedures are designed to prevent or minimize organisms from entering the area with visitors, equipment, and vehicles. This is achieved by removing any contaminated material by washing and, if necessary, disinfection.

Because we cannot control the environmental factors such as wild birds, rodents, and dust that may contaminate the secured area, we set up a second barrier, which is the barn or enclosure itself and referred to as the Restricted Access Zone. Entry to the barn is restricted to only those people that are absolutely necessary, and

entry is controlled through the anteroom to the barn. While passing through the anteroom, we prevent contamination from entering the barn by using footbaths, removing outerwear and putting on clean or barn-only outerwear, putting on clean or barn-only footwear, and washing hands. In addition all equipment entering the barn is cleaned and disinfected prior to entry.

Farm operations are designed to minimize the load of organisms in the flock's environment and to keep the flock healthy. Records are designed to allow the producer to recognize quickly when problems may be occurring. Ultimately, if a problem does occur on the farm, good records will allow for the tracing of all movement in an attempt to define the source of the infection and to identify other potentially infected flocks so measures can be taken to limit the spread of the disease.

The protocols contained in this group of biosecurity standards are based on scientifically sound, tried principles that reduce the risk of introduction of a disease into a production unit, regardless of species. The effort and cost of the implementation and maintenance of this program will protect the health of each flock, the health of the industry, and, indirectly, the health of British Columbians.

USE OF THIS DOCUMENT

The **Mandatory Standards** are collected under four major sections or chapters that group them according to specific elements of biosecurity. Each chapter of the document describes particular control point areas that must be addressed to achieve good biosecurity.

Chapter 1 covers "Farm Access Standards", including methods for excluding unnecessary visitors and methods by which necessary visitors can minimize the chances of carrying disease-causing organisms onto or off of the farm.

Chapter 2 addresses the next control point for the exclusion of diseases, "Barn Access Standards". The elements covered for this next level of control include methods to discourage entry into the barn and procedures allowing entry that, when followed, will significantly reduce the risk of disease entry into or exit from the flock.

Chapter 3 describes "Flock Health Management Standards". Mortality within a flock of birds represents both a potential disease risk to other birds on the farm and to other farms in the area as well as a good indicator of the health of the flock. For that reason, these standards describe methods by which information about flock health can be gathered, allowing an early alert to possible serious disease problems, and methods for handling dead birds to minimize their contribution to disease spread.

Chapter 4 includes "Farm Management Standards", addressing the management practices that will improve overall biosecurity. Some of these practices include internal biosecurity issues, such as rodent control and cleaning and disinfection procedures. Other practices described cover issues that will help to contain and track a disease, should an outbreak occur.

Sub Headings

Within each section describing individual Mandatory Standards, there are five subsections giving information on understanding, implementing, and improving the conditions of the standard. These subsections are titled and colour-coded as follows:

x.y.1 Mandatory Standard

This section presents the mandatory standard.

x.y.2 Interpretive Guidelines

Interpretive guidelines are points that help the reader to understand the rationale of and elements that contribute to the spirit of the Mandatory Standard.

x.y.3 Regulatory Requirements

There are many regulatory issues, legislated municipally, provincially, and federally that will affect the manner in which some Standards may be implemented. This section outlines some of the legislation that may be relevant.

x.y.4 Complying with Mandatory Standard

Procedures and examples are given in this section that will assist the reader in putting practices into effect that will help ensure compliance with the Standards.

x.y.5 Implementing Enhanced Measures

The Mandatory Standards cover the most basic practices required to achieve reasonable biosecurity. Practices that go beyond the basic Standards are strongly encouraged. This section describes some areas that would be regarded as enhancements to the Standard.

1. Farm Access Standards

Farm Access Biosecurity Concerns

Farm access represents the first critical control point for entry of an infectious disease organism into the farm. It is essential, therefore, to have a perimeter that discourages or prevents unauthorized entry by people and their equipment, while allowing authorized entry when certain conditions have been met. All visitors, including casual and professional, and equipment entering the area behind the access control, referred to as the Controlled Access Zone, should be subjected to conditions and procedures that will minimize the chance of a disease infecting the flock.

While all producers will agree that keeping disease out of their flock is the ultimate goal of a biosecurity program, it is equally important to keep any pathogen that may make its way onto the farm contained within the farm. Biosecurity is a two-way process.

All visitors must comply with the entry and exit procedures required by the farm's biosecurity procedures when entering the Controlled Access Zone. Those refusing to comply should be refused entry. Vehicles should be kept out of the Controlled Access Zone unless absolutely necessary. If a vehicle or equipment is required to enter the Controlled Access Zone, procedures to be followed should include cleaning and, when necessary, disinfection. Those people accompanying the vehicles or equipment should be required to pay attention to personal sanitation, which includes wearing Clean protective outerwear, especially foot covering, and washing and sanitizing hands. Visitor entry into the Controlled Access Zone must only be through the primary access or residence access. Any secondary accesses are for farm use only.

According to mandatory standard number 18, it is the responsibility of the farm owner to have a record of all traffic and visitors entering the farm. Delivery invoices may be used as records, however a list may be needed quickly in the event of a disease outbreak to facilitate rapid response. For this reason it is suggested that the farm owner fill in the visitor log at least weekly with information on invoices left at the farm. An example of a log book is shown in Appendix 1.

Technical Service Personnel and allied trades (hatchery, feed, veterinarians, inspectors, government regulators, equipment representatives, etc.) serve an important function in poultry husbandry, trouble shooting, sales and communication but at the same time may pose a significant threat to the biosecurity of the farm and poultry industry. Movement from farm to farm is a requirement for technical service personnel. They must be particularly diligent in adhering to their biosecurity protocol. The producer should monitor this to ensure it is happening. An effective farm visit protocol used by the Canadian Food Inspection Agency is illustrated in Appendix 2.

1.1 Secure Barrier

1.1.1 Mandatory Standard #1

A secure barrier that restricts vehicle entry must be present at all primary and secondary accesses to the Controlled Access Zone.

1.1.2 Interpretive Guidelines

Secure barriers are the first line of defence in minimizing the transmission of infectious diseases both to and from the farm operation.

a. The barrier should be a fixed gate, chain or equivalent that restricts access.
b. The secure barrier must remain closed other than:
    i. When a vehicle is passing into or out of the CAZ
    ii. When a limited activity such as feed delivery or manure handling is underway
    iii. When the CAZ is supervised
c. The secure barrier should deter unauthorized foot traffic.
d. The barrier must be capable of being secured with a lock.
e. All secondary access barriers must be closed other than when a vehicle is passing through them or when a time limited activity such as manure hauling is underway.
f. Driveways that do not provide vehicular access to the Controlled Access Zone do not require a secure barrier.
g. For safety reasons, the primary access should provide sufficient room for all vehicles to get completely off a public road.
h. Where feasible, farm residences should be accessed from outside the Controlled Access Zone.

1.1.3 Regulatory Requirements

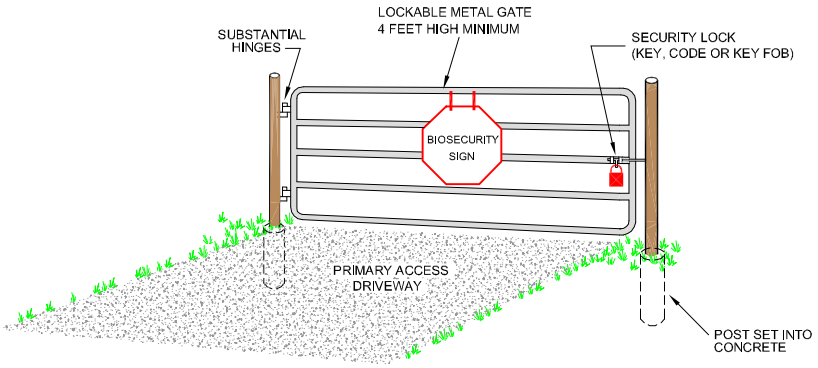
1. Applicable municipal regulations

1.1.4 Complying with Mandatory Standard

The secure barrier is designed to impede vehicular traffic and discourage unauthorized foot traffic. It must remain closed and latched, other than when a vehicle is passing into or out of the Controlled Access Zone. Regardless of the structure used, the barrier must be lockable. While it is not always necessary to lock the gate, at times of biosecurity emergencies, it is expected to be mandatory to keep it locked.

The preferred barrier is a fixed gate. The gate should be high enough to be visible from a car or truck cab and to prevent the vehicle from moving through without opening the gate. It should be made of sturdy, rust-resistant metal with permanently fixed posts (e.g. set in concrete) at both the hinge and latching ends. Approved biosecurity signage must be securely fixed to the gate and clearly visible to approaching traffic. Examples of effective gates are shown in Figures 1, 2, and 3.

Figure 1 Metal Gates



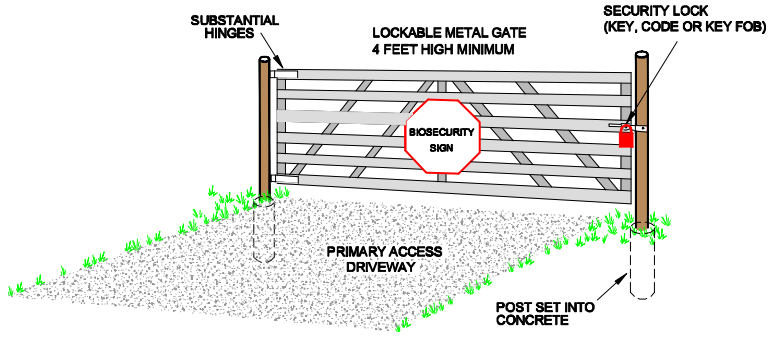
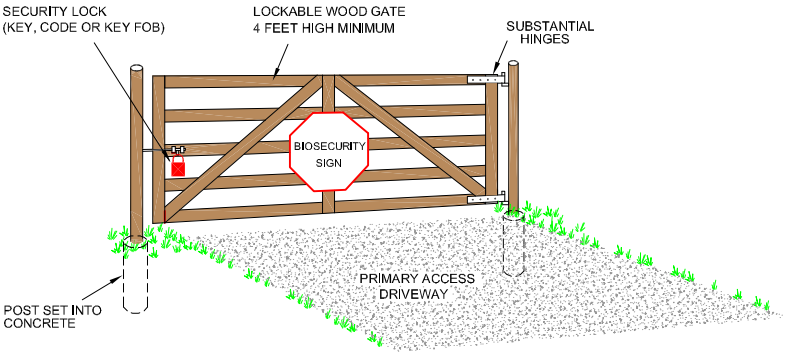


Figure 2 Wood Gate



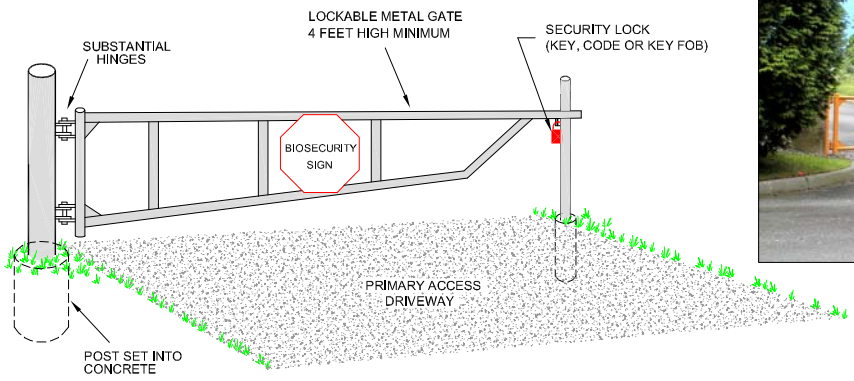


Figure 3 Tapered Metal Pipe Gate

If a gate is not feasible, then the barrier should be, at the very least, a metal chain. It should be high enough to be visible from a car or truck cab, yet low enough to prevent small vehicles from passing under it. A height of approximately 1 metre at the lowest point should be sufficient. The biosecurity signage must be securely fixed to the chain or right hand post and clearly visible to approaching traffic. If the sign is attached to the post, a reflector or sign should be attached to the chain to make it highly visible, especially at night. Figure 4 shows an example of a chain barrier.

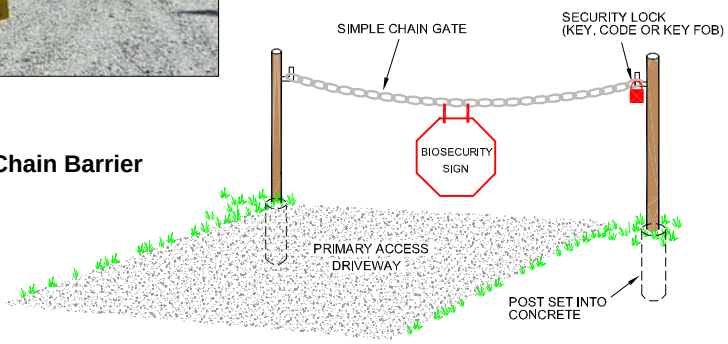


Figure 4 Metal Chain Barrier

Secondary accesses may provide easy entry to the Controlled Access Zone for unauthorized traffic. Therefore it is necessary to have a secure barrier at these locations as well. Construction of these barriers must be similar to that of barriers at the Primary access. Whether the barriers are gates or chains, secondary accesses must be locked and secure at all times. Appropriate signage must also be attached and visible.

Driveways that do not allow entry to the Controlled Access Zone do not require a secure barrier.

1.1.5 Implementing Enhanced Measures

While only manually operated gates or chains are required, remote control, automatic, or power-assisted structures would be a significant enhancement.

Primary access should provide sufficient room for a truck to get completely off a public road. An enhanced measure would be to relocate the primary access and decontamination site to a location that would accommodate all trucks, regardless of length.

Farm residences should be accessed from outside the Controlled Access Zone where possible. When the Controlled Access Zone and residence share a driveway, construction of a separate driveway for access to the residence, allowing most farm visitors to avoid the Controlled Access Zone, would be a substantial enhancement.

Remote Controlled Gate

Designated Parking Area

Farmers are encouraged to have a designated parking area for visitors, either inside or outside the Controlled Access Zone, so that vehicles are never parked right beside the Barn. Ideally, no visiting vehicles would go into the Controlled Access Zone, unless absolutely necessary

1.2 Access Signage

1.2.1 Mandatory Standard #2

Approved biosecurity signage must be clearly displayed at all primary and secondary accesses.

1.2.2 Interpretive Guidelines

The security of the Controlled Access Zone is strengthened by effective signage.

a. Biosecurity signage must be those approved by the appropriate board or commission.
b. Signs must be readily visible, clean, legible and attached to the secure barrier in a location where they can be readily viewed.
c. The sign for secondary accesses must include instructions to locate the primary access.
d. Signs must communicate that the zone to be entered is a biosecure area.

1.2.3 Regulatory Requirements

1. Environmental Management Act
2. Drinking Water Protection Act

1.2.4 Complying with Mandatory Standard

Signs must be readily visible, clean, legible and attached to the secure barrier where they can be readily seen. The signs must clearly indicate that biosecurity is in effect and that access is controlled. Contact information should be part of the primary access signage and instructions to locate the primary access must be included on the secondary access signage. Examples of signs for the primary and secondary accesses are shown in Figures 5 and 6.

Figure 5 Example of a Primary Access Sign

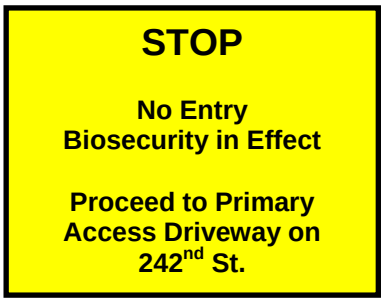


Figure 6 Example of a Secondary Access Sign

1.2.5 Implementing Enhanced Measures

The mandatory standard is the approved signage. Contact information should be added to the sign as an enhanced measure.

1.3 Primary Access Surface

1.3.1 Mandatory Standard #3

All primary accesses to the Controlled Access Zone must be constructed of hard surface or gravel that prevents any persistent accumulation of pooled water.

1.3.2 Interpretive Guidelines

Standing water can harbour infectious diseases that may be transported to or from the premises by vehicular traffic and people. Such protected pathogens also serve as a reservoir that may re-infect the farm after cleaning and disinfection.

a. Persistent standing water must not be evident on the driveway.
b. All driveways, particularly gravel driveways, must be maintained to prevent grades or potholes that allow the persistent accumulation of pooled water.

Driveway with Level Grade and No Potholes

1.3.3 Regulatory Requirements

1. Applicable Municipal Regulations

1.3.4 Complying with Mandatory Standard

Driveways must be properly graded and maintained at all times. The test for an effectively maintained driveway is that there will be no standing water evident at any time. All driveways, and particularly gravel driveways, must be maintained to prevent potholes and grades in which water may accumulate.

The construction of the driveway should be adequate for the area and conditions under which it will be used. It is recommended that the driveway be planned and constructed by a reliable company. A well-constructed and engineered driveway will mean significantly less ongoing maintenance.

A Well Maintained Driveway

1.3.5 Implementing Enhanced Measures

Paved or concrete driveways are an enhancement over gravel.

Paved Primary Access Driveway

1.4 Cleaning and Decontamination Site

1.4.1 Mandatory Standard #4

All primary accesses to the Controlled Access Zone must have an approved Cleaning and decontamination site for vehicles and personnel.

1.4.2 Interpretive Guidelines

Visible accumulations of organic matter can harbour and protect infectious organisms that can then be transported onto or off of the premises. As with water-protected organisms, this organic debris can serve as a reservoir that may re-infect the farm. These accumulations must be removed to reduce the risk of disease transmission. In the event of an infectious disease outbreak, disinfection may be required to further reduce the opportunity for disease to spread to or from the premises.

a. The cleaning site must include the availability of a source of pressurized water.
b. The decontamination site must provide the potential to undertake disinfection measures as deemed necessary.
c. Procedures must be available that describe how vehicles and personnel are to be cleaned and/or decontaminated.

1.4.3 Regulatory Requirements

1. Applicable Municipal Regulations
2. Environmental Management Act
3. Drinking Water Protection Act
4. Canadian Environmental Protection Act
5. Fisheries Act

1.4.4 Complying with Mandatory Standard

Cleaning and decontamination is the removal of accumulations of organic matter and other debris that, if not removed, could be dislodged while a vehicle, equipment, or personnel are on the farm. Any vehicles or equipment entering the Controlled Access Zone that has not been previously cleaned must be cleaned at the decontamination site.

It is important to differentiate between “Cleaning and decontamination” and “disinfection”. Cleaning and decontamination removes any dirt or organic debris that may carry disease-causing organisms from vehicles and equipment. Disinfection is another step in which the vehicle or equipment is treated with a chemical that is designed to kill viruses and bacteria. During routine operations, when there is no specific disease threat, only cleaning and decontamination is required. During certain disease events, such as Notifiable Avian Influenza, the additional step of disinfection will be required.

Water Source Readily Available

The Cleaning and Decontamination Site must be designed so that effective, thorough cleaning can be carried out at any time. It must be graded in such a way that runoff is directed to a ground area that may be seeded with vegetation to allow good drainage and filtration. If a waterway or watercourse is nearby, the runoff must be contained in such a manner that it can be removed and disposed of according to appropriate regulations. There must be a readily available source of water and cleaning agents for use as necessary. An effective method of cleaning, such as a hose and nozzle attached directly to a water source or a pressure sprayer with sufficient pressure to enable removal of organic debris, must also be available.

Under emergency disease outbreak conditions, disinfection may be required. Therefore, the decontamination site must also be designed so that disinfection of vehicles and equipment can be done. Proper cleaning and disinfection is described in Appendix 3. Figure 7 shows diagrammatic and photographic examples of effective decontamination sites.

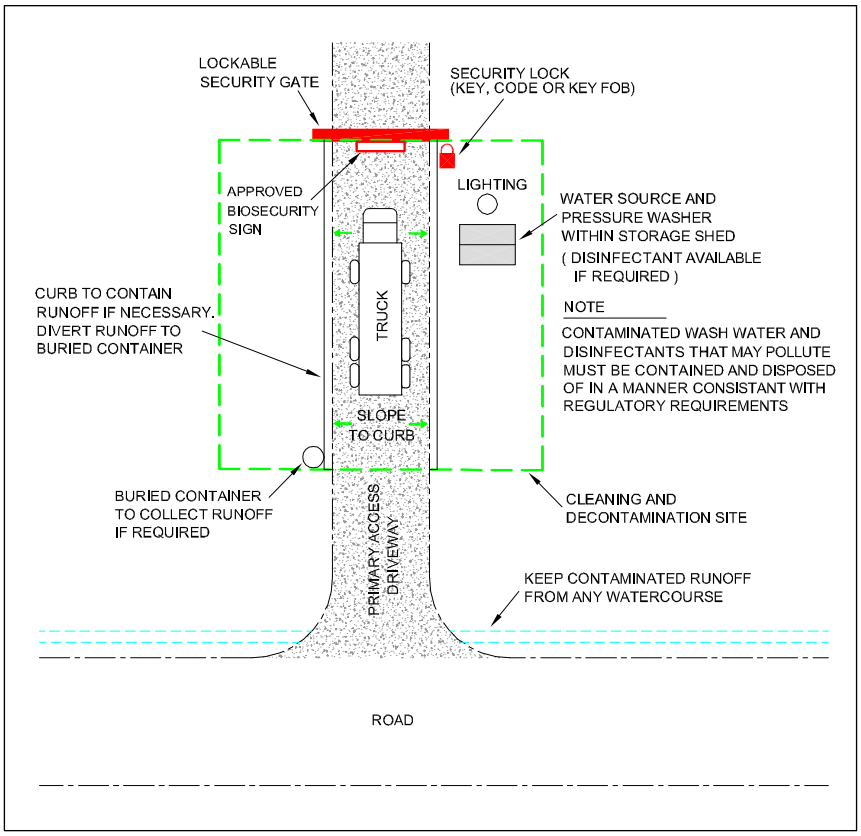


Figure 7 Schematic and Examples of an Effective Decontamination Site

1.4.5 Implementing Enhanced Measures

There are a number of enhancements that can be made to the decontamination site, including runoff collection capability, disposal field improvements, concrete with berms to direct runoff, and a shed to house disinfectants, cleaners, and a powered pressure washer.

While a collection container is necessary only where regulations require, the ability to collect any chemical runoff would be a major improvement. This might include a sunken container or a concrete trough.

Surface runoff from cleaning and decontamination of vehicles and equipment may be acceptable if prevented from flowing into a watercourse. Seeding the area with grass or similar vegetation that will trap and help filter the runoff enhances control. Concrete curbs around the decontamination site will direct any runoff into the appropriate area, even if heavy rainfall or extraneous runoff occurs.

A powered pressure washer with cleaner and disinfectant available can be used to clean vehicles and equipment as they enter the Controlled Access Zone. This will be enhanced with a shed or storage area that houses the equipment and supplies. The shed will also protect the electrical and water supply. A further enhancement would include a supply of hot water.

A decontamination site schematic is shown in Figure 7.

1.5 Access Maintenance

1.5.1 Mandatory Standard #5

The Controlled Access Zone must be maintained clean and free of organic debris at all times.

1.5.2 Interpretive Guidelines

Rationale: Visible accumulations of organic matter can harbour and allow transport of infectious organisms onto or off of the premises and can serve as a reservoir for reinfection.

a. Any organic material accumulation in the Controlled Access Zone that might result in infectious material being transported onto or from the farm by footwear, vehicle tires or a vehicle's undercarriage must be cleaned up.

Examples of Good On-farm Housekeeping

1.5.3 Regulatory Requirements

1. Applicable Municipal Regulations
2. Environmental Management Act
3. Drinking Water Protection Act
4. Canadian Environmental Protection Act
5. Fisheries Act

1.5.4 Complying with Mandatory Standard

As stated above under section 1.3.4, driveways must be properly graded and maintained at all times. Beyond construction that is designed to prevent standing water, it is important to ensure that organic debris does not accumulate on the driveway. Allowing only Clean vehicles onto the premises will be an important first step in preventing such accumulation. Should any debris or clutter be dropped onto the driveway, it should be immediately removed.

1.5.5 Implementing Enhanced Measures

Good routine maintenance cannot be improved upon. Enhanced driveway surface in the form of pavement or concrete (see Section 1.3.5) will ease cleaning efforts, and could be considered a maintenance enhancement.

2. Barn Access Standards

Barn Access Biosecurity Concerns

The barn entrance is the last line of defense in preventing entry or exit of disease-causing organisms. It is imperative, therefore, that only those that are absolutely necessary are allowed access to the barn. Because of the importance of limiting exposure of the flock to outside contacts, this area is referred to as the Restricted Access Zone.

While a visitor on foot can easily defeat a barrier at the farm entrance, locked doors will prevent or, at the very least, discourage unauthorized entry. While all animals are prohibited from the Restricted Access Zone, they may be permitted for pest control when compliant with on-farm food safety standards. Locked doors and strict entry procedures will accomplish this. Effective signage will warn visitors that they are entering a restricted area and that they are prohibited entry unless authorized by farm personnel. Once access to the barn is gained, every effort possible should be made to reduce the risk of potential pathogens from accompanying any visitors into the barn. This is particularly important for those who may have visited other farms. It is critical, therefore, that appropriate procedures for entry be in place to ensure that such disease-causing organisms stay out.

Biosecurity between barns within a single Controlled Access Zone is a practice that all farmers should follow. This will reduce the risk of the entire farm becoming infected with a disease, should a flock within one barn become infected. In the event of a disease outbreak, the fewer barns infected, the lower the risk the affected farm will have toward other farms.

2.1 Locked Barn Entrance

2.1.1 Mandatory Standard #6

All poultry barn entrances shall remain locked at all times that the barn is unsupervised by farm personnel.

2.1.2 Interpretive Guidelines

Barn entrances are high disease transmission risk areas and are the last line of defence in preventing disease transmission. It is therefore necessary to prevent inappropriate access.

a. Barn entrances that can only be opened from the inside are considered locked.
b. Barns should provide sufficient functional exits for the safety of personnel inside the building.
c. All animals are prohibited from the Restricted Access Zone, unless in compliance with other Board audited programs.

2.1.3 Regulatory Requirements

1. Applicable Municipal Regulations

2.1.4 Complying with Mandatory Standard

Locks need not be sophisticated items. For most doors, through which routine entry is not required (e.g. load-out doors), barrel bolts or bars operated from the inside would be sufficient. On the main entry, however, a door that is lockable from the outside is required and lockable from both sides is recommended. A simple keyed passage set would be all that is required. Once inside, it is not necessary for the worker to lock the door. For emergencies, it is advisable to have two doorways near opposite ends of the barn that are easily opened from the inside to allow rapid escape if required.

While all animals are prohibited from the Restricted Access Zone, they may be permitted for pest control when compliant with on-farm food safety standards. Locked doors and strict entry procedures will accomplish this.

2.1.5 Implementing Enhanced Measures

Sophisticated locks with crash bar exits would be an enhancement over a simple lock. This would allow the door to be locked at all times yet allow easy exit as required. Electronic keyless entries, with access either by entering a code or using an electronic keycard would also be an enhancement. This would allow authorized personnel to have access without the necessity of having to carry a metal key.

2.2 Approved Signage

2.2.1 Mandatory Standard #7

Approved restricted access signs shall be posted at all barn entrances.

2.2.2 Interpretive Guidelines

The barn entrance is a high disease transmission risk area and is the last line of defence in preventing disease transmission. It is therefore appropriate to post signs to limit non-essential access.

a. Signs posted must be those approved by the appropriate board or commission.
b. Entrance signs will identify that the area beyond the entrance is a restricted access zone.
c. Entrance signs must be readily visible, clean and legible.

2.2.3 Regulatory Requirements

None.

2.2.4 Complying with Mandatory Standard

The approved "Restricted Access" sign must be place in a highly visible place, preferably on the main access door. Signs should also be placed on all secondary accesses. The relevant Board or Commission will provide appropriate sign design. An example is presented in Figure 8. This sign, displayed visibly on the door and kept clean and free of dirt will meet the mandatory standard.

Figure 8 Example of a Restricted Access Sign

2.2.5 Implementing Enhanced Measures

As with Farm Entry, the Mandatory Standard signage must be dominant. While other signs may give more information, such as directions for contacting farm personnel, the basic message of "Restricted Entry" cannot be enhanced.

2.3 Anteroom

2.3.1 Mandatory Standard #8

All poultry barns must have an anteroom at all primary entrances that allow personnel to comply with the farm biosecurity procedures during entry and exit.

2.3.2 Interpretive Guidelines

Primary barn entrances are the last line of defence in preventing disease transmission. The anteroom provides a unique opportunity to reduce the risk of disease transmission by minimizing any contaminants moving from the outside environment to the inside and from the inside environment to the outside.

Example of Distinct Physical Separation

a. The anteroom provides a transition zone and must:
   - permit adequate space for a distinct physical separation of the "outside area" and all "inside areas"
   - have a clearly identifiable demarcation between the outside and the inside areas

b. The anteroom must be equipped for:
   - hands to be cleaned with appropriate disinfectants
   - a change of clean/disinfected boots across the outside and inside demarcation
   - a change of clean/disinfected outer-ware including head cover
   - sufficient space for the number of personnel utilizing the anteroom

c. The minimum standard for a free range farm anteroom will consist of a covered area with demarcation and boot change when entering and leaving the range area.

2.3.3 Regulatory Requirements

1. Applicable Municipal Regulations

2.3.4 Complying with Mandatory Standard

The anteroom provides a unique opportunity to reduce the risk of transmission by minimizing the movement of contaminants into or out of the barn. While the farmer's goal is to prevent entry of a disease-causing organism into the barn, it must be remembered that it is also the farmer's responsibility to prevent escape of such contamination from the barn. In terms of biosecurity, it may be useful to think of the barn and bird-holding area as the "clean" area, in spite of the intuitive tendency to think of an area with manure as dirty. From the flock health perspective, potential infections, which should be considered "dirty", are outside and must be kept there. It is the anteroom that will provide that barrier and be the transition area from "outside" or "dirty side" to "inside" or "clean side".

A workable anteroom provides enough space to have a separating line or demarcation between the door entering the building and the door entering the bird holding area. The recommended separation is a solid barrier such as a 2x6 secured on edge, over which one must step when entering the inside or clean side of the anteroom. Alternatively, a distinct line painted on the floor could be used to show the separation. This provides personnel with a clear demarcation between the inside and the outside. Space within the anteroom should be available to hang outside outerwear on the outside of the barrier and barn coveralls and head cover on the inside of the barrier. The transition concept for an anteroom is shown in Figure 9. Additionally, Figure 9a and 9b illustrate barrier types.

Figure 9a Solid Barrier

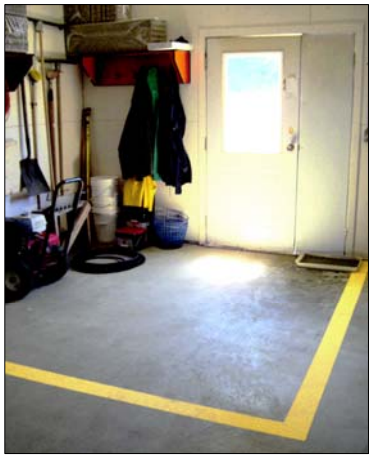


Figure 9b Painted Line Barrier

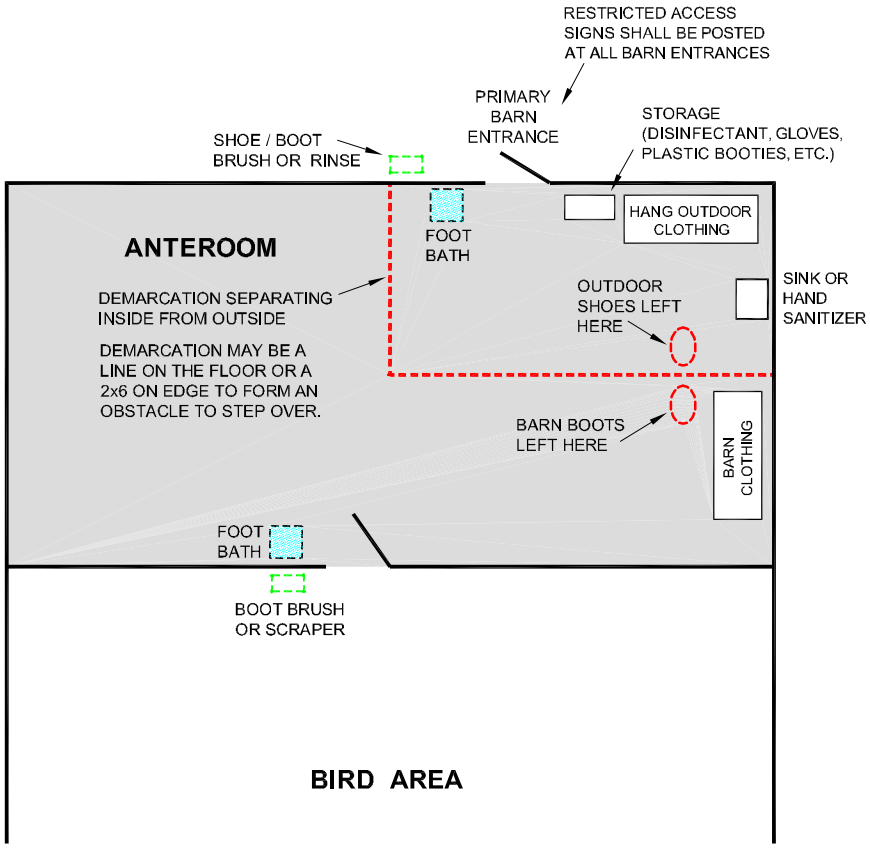


Figure 9 Anteroom Transition Zone

A change of footwear, or plastic boots to cover outside footwear, must be available. Footwear must be changed (or covered with plastic boots) in the transition from "outside" to "inside" and back. The anteroom may also have a boot brush or boot rinse area and a well-maintained footbath at the outside of the building or just inside the doorway to the anteroom, as well as a footbath on the "inward" side of the anteroom to be used on exit from the bird holding area. The proper use and maintenance of footbaths is essential and is described in more detail in Appendix 4. Additionally, either a washstand or hand sanitizer should be available. Effective hand sanitation is described in Appendix 4. A place to hang clothing on each side of the transition area should be within easy reach, so outside outerwear can be left on the "dirty" side and inside outerwear (coveralls, hats) left on the "clean" side.

All people entering the farm must follow the farm and barn entry procedures as outlined in the farm SOP's. Procedures that should be expected of all people, including technical service personnel, are presented in Appendix 2.

Anteroom Design

Because of the wide variety of barn and bird-housing configurations, designing an effective anteroom can be a challenge. Many modern barns, particularly in layer and broiler breeder operations, are constructed with a spacious anteroom area that is designed for ease of movement, particularly for egg handling. More modern broiler chicken barns also have ample anteroom space for effective utility. Some older barns, however, may have small anterooms or no anteroom at all, so some creative modification may need to be applied. Similarly, some turkey operations or specialty bird operations that are built in a more open configuration may present unique challenges.

Layer and Broiler Breeder Barns

Modern Layer and Breeder Barn anterooms are virtually custom-built for effective anteroom design. The rooms are spacious and generally easy to clean, owing to the need for safe, clean handling of eggs. It is a relatively simple matter, therefore, to designate a single primary entry point and create a transition zone at that point. With a line or a physical barrier designed around the entrance, the "dirty" zone is readily defined. There must be enough room, however, to be able to move around in this area without accidentally stepping into the "clean" zone. An example schematic of an anteroom for a layer or broiler breeder barn is shown in Figure 10.

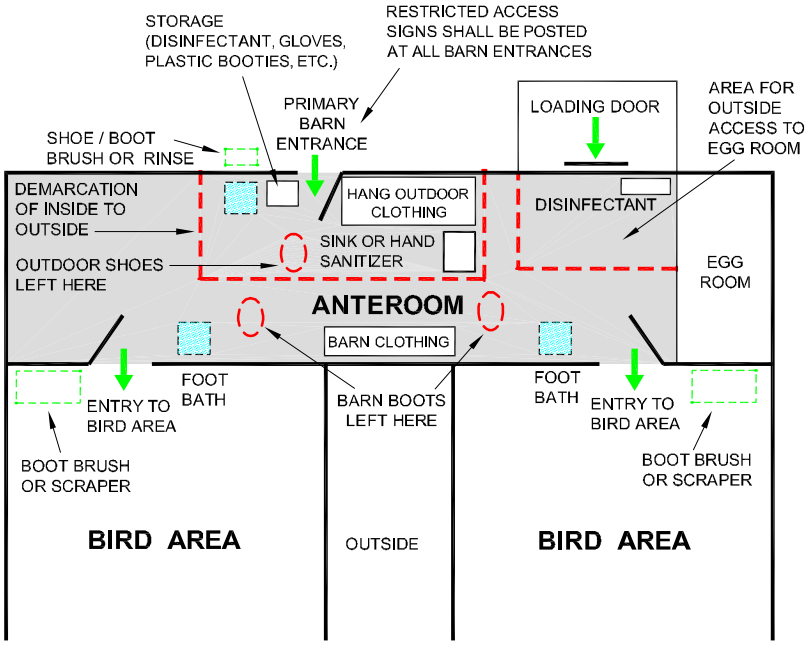


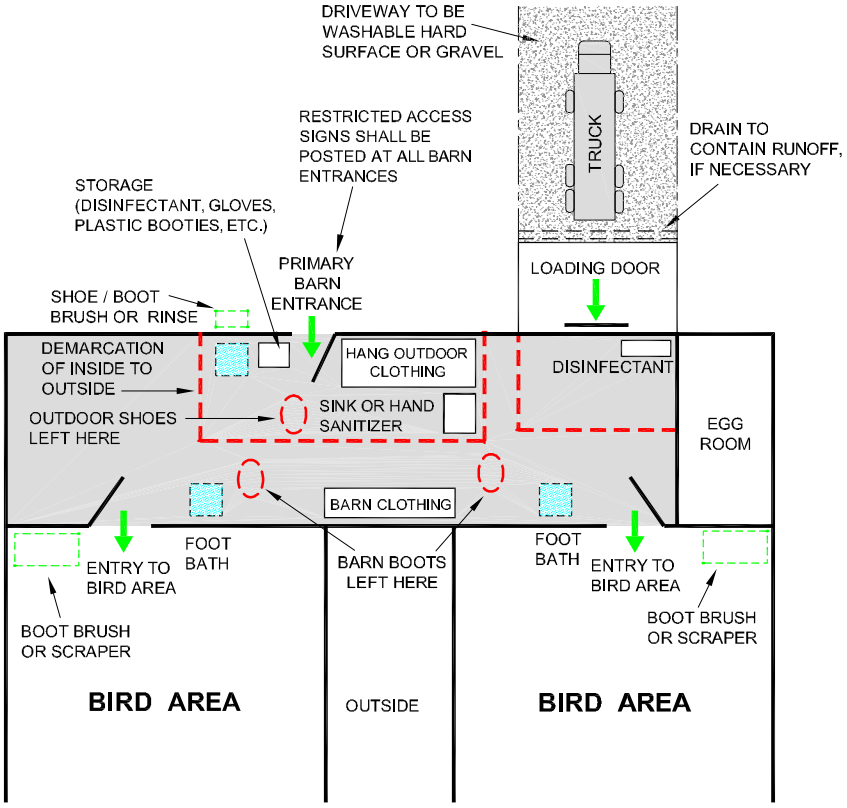
Figure 10
Layer / Breeder Anteroom Configuration

Figure 11 Additional Transition Zone

An additional transition zone for passage from the anteroom into the barn area may be designed, as shown in Figure 11. This is particularly useful if more than one barn is accessed through the same anteroom.

The egg room and loading dock areas are potential points for breakdown in biosecurity as egg flats must move from the anteroom into the egg room, then back out for loading onto the egg truck. Ideally, eggs would load into the egg room through one door on the "clean" side of the anteroom and be loaded out through a separate door on the "dirty" side. While future barns may be built with this concept in mind, most contemporary barns are not. Therefore, every effort should be made to ensure that the load out process is conducted in a manner that will prevent any contamination back into the barn or that any potential contamination leaving the barn is minimized. For example, the loading dock area could be considered "dirty", while the inside portion considered "clean". Any pallet jack entering the barn, therefore, would be disinfected before crossing back in. The loading dock area should be designed to handle any runoff. An example layout for the loading dock area is presented in Figure 12.

Figure 12
Layer / Breeder Anteroom Configuration with Loading Dock



Broiler Chicken Barns

As with breeder or layer barns, most modern broiler chicken barns are designed with an ample anteroom. Designating the entry transition area is a simple matter that can be patterned after the design for breeder or layer barns. An example anteroom configuration for a broiler chicken barn is shown in Figure 13.

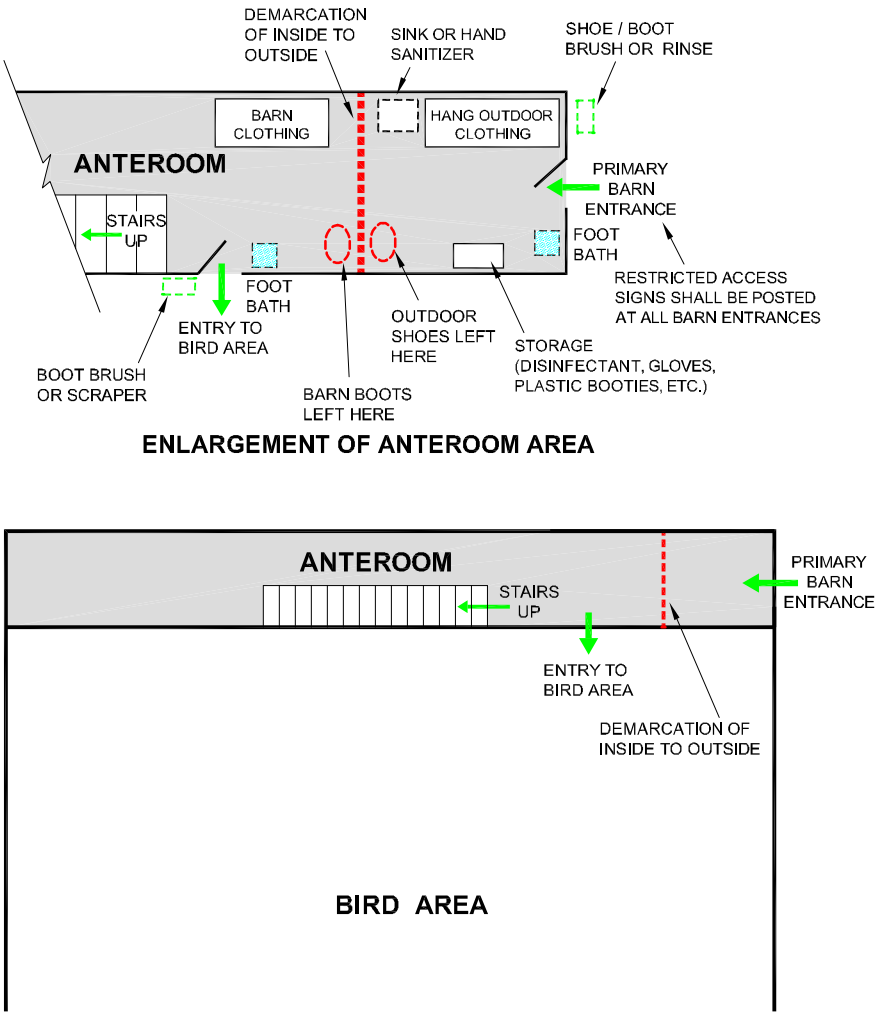


Figure 13
Broiler Anteroom Configuration

Some older barns, however, may have very small anterooms, or no anteroom at all. In some instances, the entry area can be designed to fit into the small area available. A challenging design in a tightly spaced anteroom is shown in Figure 14. However, some structural changes, such as door relocation, may be needed in order to make an effective transition.

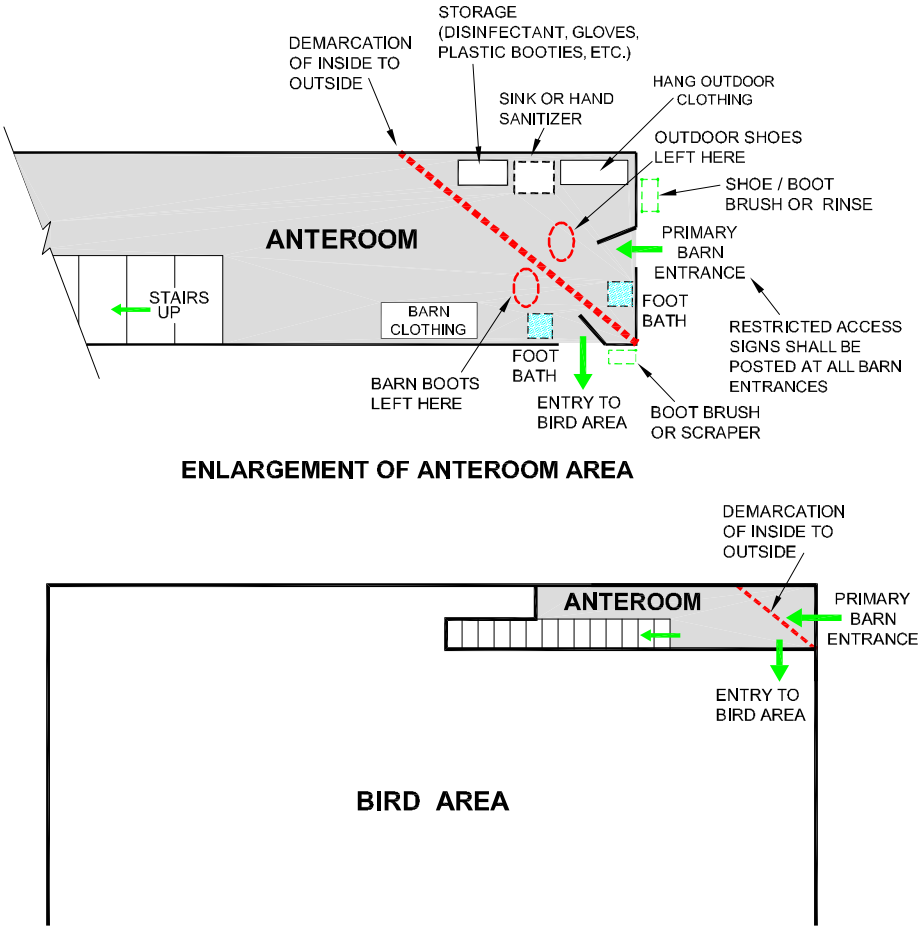


Figure 14
Small Broiler Anteroom Configuration

In broiler chicken barns with anterooms that are too small or with no anteroom at all, a small room can be built or placed at the entryway, thereby providing a sheltered area for entry (see schematic, Figure 15). Pre-built garden sheds can be purchased from local building supply stores, or a new section can be added on to the barn. The add-on structure must be enclosed and have a hard-surfaced floor that can be cleaned and disinfected. It must be large enough to accommodate all the attributes of the anteroom entry area. A shed or structure of about 2.5 metres by 3 metres would likely be the minimum to accomplish that goal.

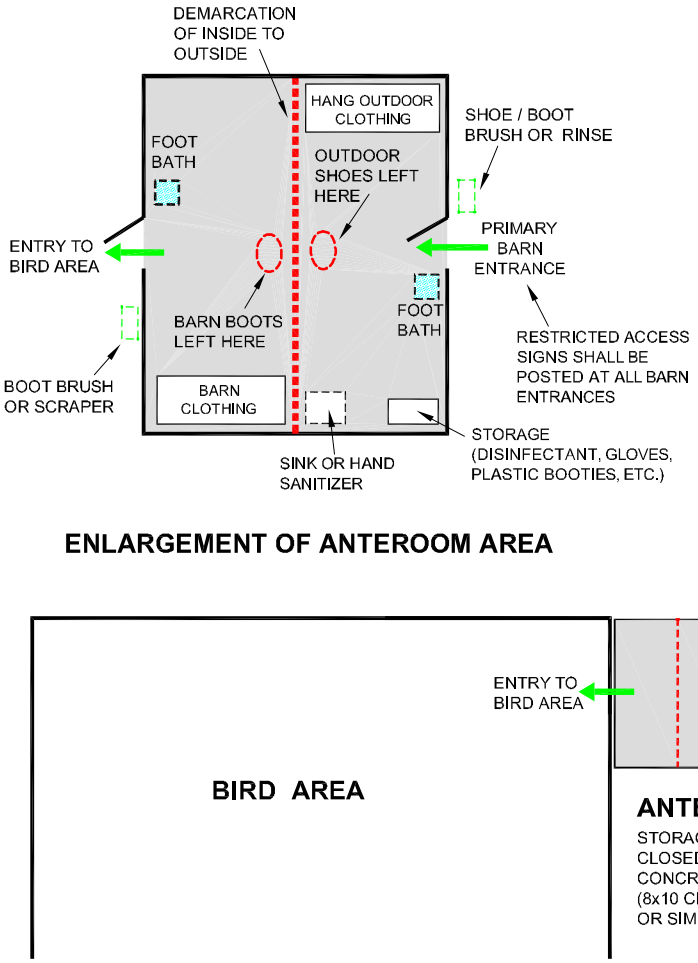
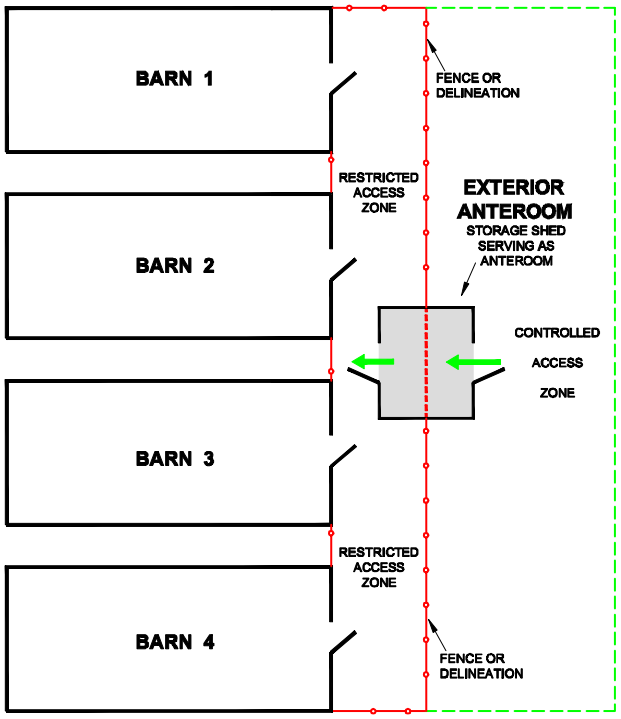


Figure 15
Exterior Anteroom Configuration

Alternative Configuration for Older Multiple Barns

For older multiple barns with inadequate space for anterooms in each building, a central anteroom that serves all buildings may be considered as an alternative, after a risk assessment. Such a configuration might be a shed placed in a central location with a fence or other physical demarcation defining a zone that includes the entry to all barns. An example of such a design is presented in Figure 16. When such a configuration is considered, however, all areas beyond the "inside" of the anteroom must be considered the same as the Restricted Access Zone. The extended Restricted Access Zone must be defined in such a way that there is no possibility of "inside" contamination mixing with "outside" contamination. It is also emphasized that this is not an ideal situation but a compromise that will allow some older premises to comply with the Mandatory Standard both in spirit and technically. When this configuration is used, a Standard Operating Procedure outlining practices to be followed when moving among barns, such as footbaths or boot changes, should be written and included in the Farm Management section. This compromise does not exclude the requirement for locks on each barn door (Mandatory Standard #6). Designs for new buildings are expected to include an anteroom that meets the mandatory standard.

Figure 16
Example of a Single Access Entry Configuration for a Series of Separate Barns



Adjoined Housing Units (Turkey barns, multi-age specialty birds)

Multi-age flocks housed in a series of adjoined barns pose a particular challenge to biosecurity concepts because they offer the opportunity for people to pass repeatedly back and forth among the various barns. However, if one considers the adjoined barns to be a single unit sharing air space, then there are means by which the spirit of biosecurity can be met. One possible solution, for example, could be to encircle the entire unit with a fence, with a single access point for personnel and an access point for equipment, over which disinfection must take place as it moves in and out. A structure for transition from "dirty" to "clean" and back could be installed, allowing for effective movement in and out. Once workers are inside the collection of barns, all tasks in that area could be carried out prior to moving out and on to another area of the farm. Alternatively, if access from barn to barn can be achieved inside the buildings, then a building serving as an anteroom can be attached for primary entry and exit, while all activity then remains inside the barn. Example layouts are presented in Figures 17 and 18.

Figure 17

Entry Configuration For a Series of Adjoining Rooms Sharing Air Space

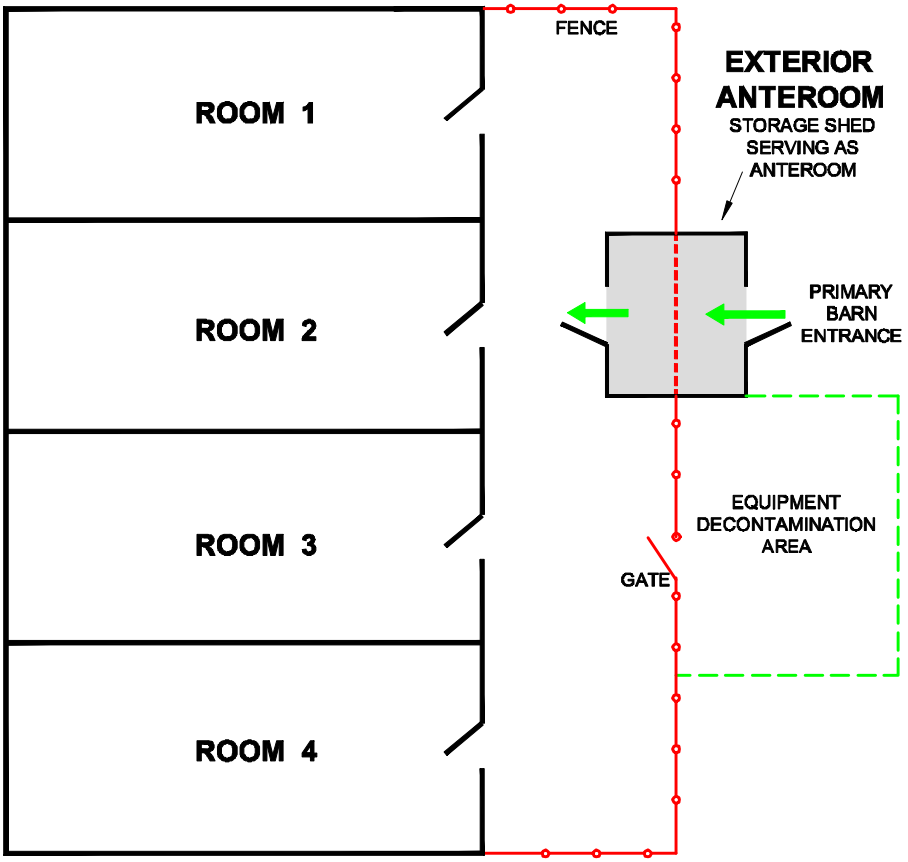
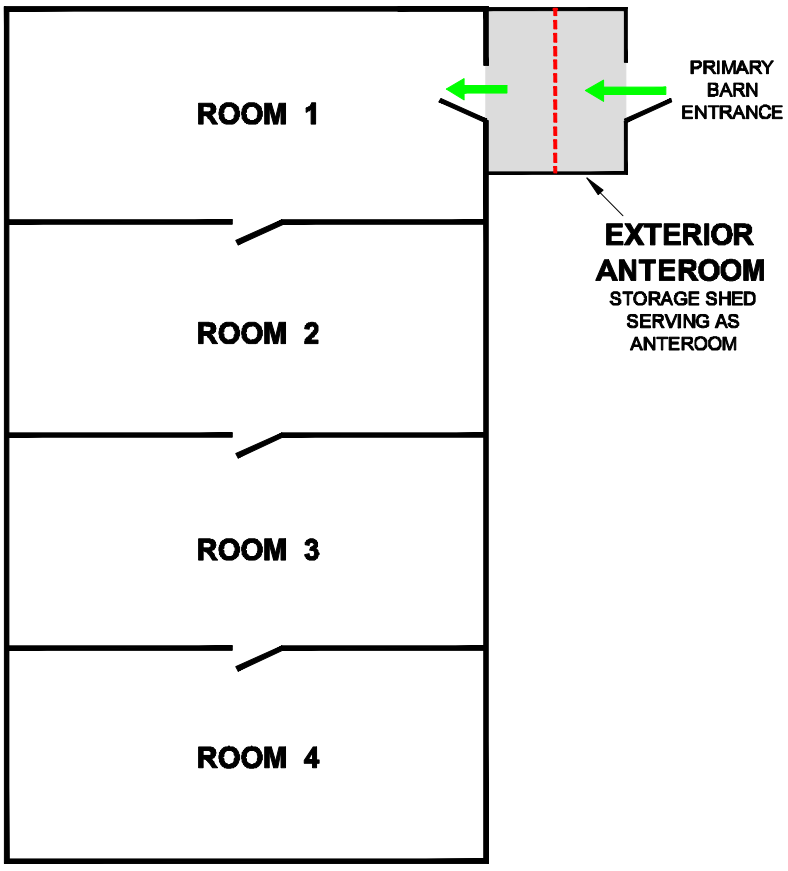


Figure 18

Single Access Entry Configuration For a Series of Adjoining Rooms

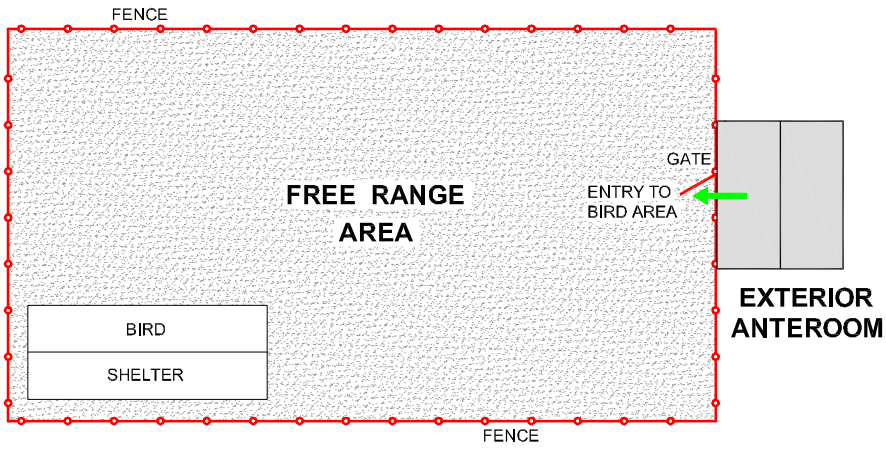


Free Range Birds

Free Range configurations are yet another challenge for biosecurity. While contamination of a flock from overhead may readily occur, there is still much merit in preventing other disease challenges from entry via human vectors. Furthermore, if infection is introduced from overhead, the flock then becomes a multiplier for that infection and it becomes imperative to prevent its exit and therefore transmission to other at-risk flocks. So, while it may appear to be a losing battle, the anteroom concept does, in fact, offer significant value to a Free Range situation.

The primary access point into the range area may be directly or through a barn. If entry is through a barn, then an anteroom can be designed into the structure, either by using existing space or by adding a shed. If primary access is through a gate, however, then the anteroom may be added as a shed or a roof over the access point. All attributes of an anteroom must be present, and the surfaces should be cleanable. A schematic of an anteroom configuration for a Free Range operation is presented in Figure 19.

Figure 19
Free Range Anteroom



Anteroom Beneficial Practices

In order to be fully effective, the anteroom must be used in the manner in which it was designed. Therefore, it is important to have a Standard Operating Procedure (SOP) that describes in a step-by-step fashion the manner in which a person will enter and leave the bird-holding area. An example SOP is shown in Appendix 5. The SOP for any given barn may not be exactly the same as that shown in the example, but should document the practices of the particular farm.

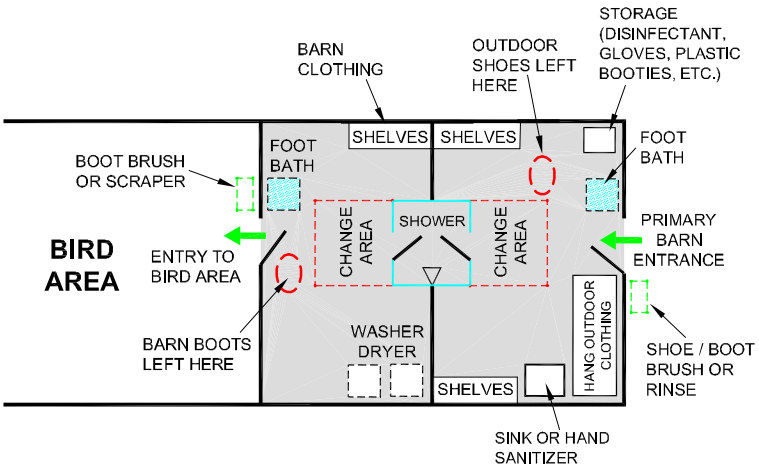
The SOP is a reference document that guides the producer in the procedures required to enter a barn. More importantly, it will guide employees, casual workers, and service people on barn entry procedures. It should be considered as an instructional document and all new employees should be required to read it and adhere to its directions.

2.3.5 Implementing Enhanced Measures

A neat, clean, effective anteroom is a basic standard upon which it is difficult to improve. However, in some older buildings, structural changes that allow improvements to the anteroom would be enhancements. This might be something as simple as relocating a door to a more involved addition to the barn that builds in a functional anteroom. Other enhancements could include:

- Drains placed into the loading dock area to allow proper drainage
- Loading dock area constructed with hard surfaces that can be easily cleaned and disinfected
- An enclosed, pass-through change room that allows removal and storage of all outdoor clothing and donning of barn-only clothing while passing into the "inside" portion of the barn
- Shower-in, shower-out capabilities. This would be a step above a two-way change room, with a shower dividing the "inside" from "outside" sections. See Figure 20.

Figure 20
Shower In / Shower Out Anteroom



2.4 Anteroom Maintenance

2.4.1 Mandatory Standard #9

Barn entryways and anterooms must be maintained clean and free of debris at all times.

2.4.2 Interpretive Guidelines

Visible accumulations of organic matter may harbour infectious organisms and increase the risk of the transmission of these organisms either into or out of the barn. Accumulations of organic matter must be removed to reduce the risk of disease transmission.

a. Anterooms must be regularly cleaned and disinfected.

2.4.3 Regulatory Requirements

1. Applicable Municipal Regulations
2. Environmental Management Act
3. Drinking Water Protection Act

2.4.4 Complying with Mandatory Standard

An effective anteroom will provide a last barrier to the entrance of disease-causing organisms into the flock. However, the effectiveness of the anteroom will be diminished with inadequate maintenance. Apparently unused space becomes a convenient storage area for equipment and supplies, clutter that can quickly accumulate. This clutter not only traps organic material and dust, but also provides excellent cover for rodents. Anteroom maintenance must also include a pest control program as part of the Pest and Environmental Management standard.

Footbaths must be maintained in order to keep them working properly. Hand washing is even more important than cleaning footwear. Therefore, hand sanitizer or washstands must be kept properly stocked to make sure they are used. Barn outerwear, including coveralls and head cover, should be cleaned and disinfected regularly.

Cleaning and Disinfection

The anteroom should be cleaned and disinfected on a regular basis. Barns from which flocks are removed routinely, such as broiler barns or pullet rearing barns, should be cleaned and disinfected each time a flock is removed. Regularly scheduled cleaning and disinfecting of anterooms for constantly populated barns should be described in the anteroom maintenance SOP.

To begin the cleaning process, all equipment and materials in the anteroom should be cleaned, disinfected, and removed or, if there is sufficient space, gathered in the center of the room. Equipment and materials that do not belong in the anteroom should be relocated, while essential equipment can be returned once the process is completed. The room should then be washed down with a pressure washer using an appropriate cleaner.

Washing should be started with the ceiling and higher areas and move down so all debris is ultimately forced to the floor and out of the building. Often, a pre-soak will help to loosen the debris for easier removal. Spray the entire room with just water or water with cleaner and leave for a few hours, and then carry out the cleaning procedure. Once cleaned, the room is then allowed to dry and, when thoroughly dry, sprayed with an appropriate disinfectant. Again, spray the disinfectant from top down, applying just enough to cover the entire surface, until just running off. It is not necessary to excessively soak the surfaces with the disinfecting solution. It is important that all cracks and corners be addressed, as these are excellent areas for the entrapment of organic material, potentially preserving pathogens for the next flock's arrival. It is important to ensure that the cleaner and disinfectant are compatible and that the manufacturer's directions are followed (see Appendix 3).

After everything has thoroughly dried, essential equipment, that has also been cleaned and disinfected, can be returned to the room. This is also a good time to find and repair any defects in the structure of the room, including holes or gaps that can allow the passage of mice or rats.

Clutter Control

The best way to control clutter is to make sure every item taken into the room is returned to its original location as soon as possible. In addition, the anteroom should not be used to store non-essential equipment. The maintenance SOP should reflect this and all workers should be instructed to follow those rules.

Maintenance of Supplies

All supplies required for the proper operation of the procedures for barn entry must be readily available. The following supplies will enhance the functionality of the anteroom:

- Disinfectant for footbath
- Hand sanitizer
- Antibacterial soap if a wash stand is available
- Plastic boot covers for visitors
- Disposable head cover for visitors
- Clean coveralls for each worker
- Footwear for each worker
- Spare coveralls or disposable coveralls for visitors

Other items, such as disposable gloves and dust masks would also be of value.

All anteroom maintenance procedures should be described in a Standard Operating Procedure. The SOP for anteroom maintenance should include regular cleaning and disinfecting procedures, clutter control procedures, and maintenance of supplies, including a routine check of supply inventory. An example SOP is presented in Appendix 5.

2.4.5 Implementing Enhanced Measures

There are no enhancements over a properly maintained anteroom.

3. Flock Health Management Standards

Flock Health Management Biosecurity Concerns

The farmer will be the first to see signs of illness that may be a serious infectious disease in the flock. If a Foreign Animal Disease (FAD), such as Notifiable Avian Influenza or Exotic Newcastle Disease, were to break through the farm's biosecurity protocols, then that farm becomes a serious risk to the rest of the industry. It is the early recognition of that first case that will be critical in containing and eliminating the disease quickly.

Farm mortality records will alert the producer to a potential problem, which should trigger the appropriate responses, the first of which will be to find the cause of the problem. The farmer should not try to diagnose the condition but instead should consult with his or her veterinarian or the diagnostic laboratory. If an infectious disease is suspected, then the next response will be self-quarantine. Once the diagnosis has been made, a response strategy will be designed in consultation with the farm's veterinarian. This response may be as simple as a management adjustment or administration of a treatment. If a FAD is discovered, then the appropriate response will occur in accordance with various Emergency Response Plans that will be followed by the industry.

The essential elements of flock health include keeping good, consistent records, recognizing healthy birds, recognizing unusual mortality or other indicators of illness in the flock, and responding appropriately to those observations. In order to comply with OFFSAP, records of all vaccinations and treatments must also be kept.

Dead birds may be a high-risk source of infectious disease and must therefore be handled and disposed of through appropriate methods on the premise where they died or at a central facility with appropriate provincial permits.

3.1 Flock Health Records

3.1.1 Mandatory Standard #10

Individual flock health records must be maintained.

3.1.2 Interpretive Guidelines

In the event of a disease outbreak the individual flock health records will provide invaluable information to assist in containing the outbreak.

Interpretive Guidelines:

a. Records must include a count of mortalities collected at least once each day.
b. Production records must be kept.
c. Veterinary and diagnostic reports are also part of the health records.
d. Any response to an unusual mortality rise, including submission for diagnosis, treatments undertaken, or management adjustments, must be recorded.
e. Any addition or removal of birds to or from a flock must be recorded and all health records accompanying the birds must be kept in the flock records.

3.1.3 Regulatory Requirements

1. Applicable Municipal Regulations
2. Health of Animals Act

3.1.4 Complying with Mandatory Standard

Mortality records are the first step in assessing the health of a flock. The term "Mortality" should include birds that appear to be ill and may or may not be culled. If several birds appear to be ill, but no mortality occurs, your veterinarian should be consulted or a sample of these birds should be culled and submitted to your veterinarian or diagnostic laboratory for evaluation. Any rise in sick or dead birds must be recorded and the appropriate response protocol described in the farm's Standard Operating Procedure (SOP) must be followed.

At a minimum, mortality records must include the total number of dead birds found each day. Depending upon the poultry class, convenient record forms are provided by the hatchery or chick supplier. For Table Egg Layers and Broiler Breeders, a column for mortality is included with the feed and production records. Each batch of broiler chickens is provided with a record for daily mortality with convenient categories. These records should be accurately completed each day.

Mortality and illness will vary considerably with the type of bird raised on your farm. Consequently, records, expected mortalities, and possibly responses will vary significantly from farm to farm. Record forms provided by the hatcheries or breeder companies are suitable for collecting this data. Examples of these records are presented in Appendix 7.

Recognizing Sick Birds

It is important to recognize sick birds. It is simple to check through a flock to find dead birds, however, it requires much more skill to recognize sick birds. When walking through a flock, take time to scan the birds and spot individuals that may be showing signs of illness. Some of those signs might be:

- Lethargy, lack of energy, drooping wings
- Loss of appetite
- Decreased egg production
- Soft-shelled or misshapen eggs
- Swelling of the head, eyes, comb, wattles and hocks
- Purple discoloration of the wattles, combs and legs
- Nasal discharge
- Coughing, wheezing, or sneezing
- Lack of coordination or complete paralysis
- Muscle tremors or twisted necks
- Diarrhea
- Sudden or excessive mortality without clinical signs

Source: USDA

Figure 21 Sick Birds

It can sometimes be beneficial to stand or sit quietly, watching and listening to the birds. Once the flock has settled down, birds that are only mildly ill may be seen. When things have quietened down, abnormal respiratory sounds, often called a "snick" can be heard. These sounds may have a variety of characteristics such as a high-pitched "squeak", a sudden "chuck" sound, like a cough, or a gurgling or rattling sound. Some pictures of sick birds are shown in Figure 21.

Production Records

Table Egg Layers and Broiler Breeder producers generally keep daily feed and production records. Any drop in egg production or feed consumption, or a rise or fall in water consumption that is unexplained by other factors, should alert the producer to a potential problem. If ill or dead birds are seen, then the response strategy for dead birds must be followed. If the problem is related to production only, then veterinary advice must be sought.

For any breed of bird, whether meat or egg, a drop in feed or water consumption can be a sign of an infectious disease. Feed and water consumption should be monitored closely. A significant drop in consumption must be considered a trigger event and specific diagnostic actions should be taken. Included among those actions would be investigations of the watering or feeding system to ensure that a failure in the supply has not resulted in the observed consumption drop. If there is no physical reason apparent, then diagnostic procedures should be

followed in the same manner as if sick birds were observed. Included among the diagnostic procedures should be the collection of feed and water samples. In the event of a drop in production or a drop in feed consumption, veterinary advice should be sought.

For breeders and layers, production records currently in use will provide a good means for recording this information. The result of any investigation should be recorded in the barn log.

A drop in egg production, or fertility for breeders, may be an indication of infectious disease. Such drops should be investigated and diagnostic services sought if a management cause cannot be readily identified. Production records currently in use are adequate for capturing this information.

Checking the Flock for Illness or Mortality

Broiler Chickens, Broiler Breeder Pullets and Cockerels, Layer Pullets and Turkeys

a. The flock should be inspected at least once daily by the farmer or trained farm personnel.
b. Walk through the flock slowly, looking for sick or dead birds.
c. Walk a pattern that covers the entire barn. The route followed will depend upon the size of the barn. For an average barn, walk up the wall on one side, down the inside of the feed line on one side, up the feed line on the opposite side, and finally down the wall on the opposite side.
d. Gather all dead or culled birds for removal.
e. Record the number of dead and culled birds found.
f. Follow the appropriate response protocol described in the farm SOP if there is a rise in mortality.
g. If there is a rise in mortality that cannot be explained, then it is essential that a sample of birds be submitted for diagnostic services.

Adult Broiler Breeders or Free Run Layers

a. The flock should be inspected at least once daily by the farmer or trained farm personnel.
b. Walk through the flock slowly, looking for lethargic or dead birds.
c. Walk through the slats the entire length of the barn, back down the scratch area, then up the opposite slats. Check the nest boxes carefully to make sure that no dead birds are occupying a slot.
d. Gather all dead or culled birds for removal.
e. Record the number of dead or culled birds.
f. If there is a rise in mortality, follow the appropriate response protocol as directed by the farm SOP.
g. If there is a rise in mortality that cannot be explained, then it is essential that a sample of birds be submitted for diagnostic services.

Table Egg Layers in Lay

a. The flock should be inspected at least once daily by the farmer or trained farm personnel.
b. Walk through the barn slowly, looking for sick or dead birds. Cage birds require special attention as the live birds can easily conceal a bird that is down or dead. Look carefully in the lower tiers, as well.
c. Gather all dead or culled birds for removal.
d. Record the number of dead and culled birds found.
e. Follow the appropriate response protocol if there is a rise in mortality.
f. If there is a rise in unexplained mortality, then it is essential that a sample of birds be submitted for diagnostic services.

Response Strategies

While the goal of any producer will be to keep mortality as low as possible, some mortality can always be expected. Historical records will give an idea of what expected mortality should be. Furthermore, daily mortality records will show the trends occurring in a current flock, so any unexpected rise in that trend will also alert the producer of a problem. Any change in mortality must then trigger a response that should include seeking veterinary advice.

Response triggers are those indicators, such as a rise in the number of mortalities or sick birds, or a drop in feed consumption, that cause the producer to take specific actions. Response protocols are descriptions of those specific actions to be taken when a trigger is recognized. The farm's standard operation procedures will outline the various responses to specific triggers.

The following are general response triggers:

Trigger	Response
1. Sudden rise in mortality	Call veterinarian (either directly or through the feed company or hatchery) or submit a sample of mortality to veterinarian or diagnostic laboratory
2. A rise in the number of sick birds observed	Call veterinarian or submit a sample of typical sick birds to veterinarian or diagnostic laboratory; prepare for self-quarantine
3. A drop in feed or water consumption	Call veterinarian; collect a sample of feed or water
4. A drop in egg production	Call veterinarian; collect a sample of feed and water
5. Sudden rise in "Other" mortality	Call veterinarian or submit a sample of typical mortalities to veterinarian or diagnostic laboratory; prepare for self-quarantine.

Because mortality rates normally vary significantly from farm to farm, the Standard Operating Procedures (SOP) should be written in consultation with the farm's veterinarian. Standard Operating Procedure templates or examples are provided in Appendix 5.

The results of a necropsy performed by the diagnostic laboratory should be discussed with a poultry veterinarian. Once the condition has been diagnosed, treatment or other strategies can be designed. All laboratory and veterinary records must be kept with the flock records. Additionally, all treatments and vaccinations must be recorded (For the purposes of this document, a treatment includes not only therapeutics but also vaccines and feed adjustments. A record should be kept of every treatment done, and this can be detailed on the flock health and production form or in the barn log).

Upon suspicion of an infectious disease, the producer must follow the Self-Quarantine Standard Operating Procedure. An example SOP is given in Appendix 5. A description of the Self-quarantine procedure is outlined in Appendix 6; this procedure includes an Emergency Contact List that should be kept readily available.

Diagnostic Laboratory Submissions

Submissions to the diagnostic laboratory or to the consulting veterinarian must be carefully selected. The samples should be alive or freshly killed birds that show signs typical of the predominant illness or mortality. They must be contained according to the procedures outlined in the mortality handling section of this document; that is in a sealed container that can be disinfected prior to removal from the farm. The samples must be delivered to the laboratory as quickly as possible and a complete procedure for diagnostic submissions is presented in Appendix 8.

Addition of Birds into an Existing Flock

Chicks acquired from a registered hatchery or known source will generally be a very low risk for introduction of an infectious disease. However, the movement of any birds onto the farm will always present some risk, and this is especially so when cockerels are introduced to spike a breeder flock or pullets are introduced to top up a table egg lay flock. Moving birds from one flock or farm to another is a high-risk practice and should be avoided as much as possible. However, circumstances often require this to be done, so it is essential that every effort be made to move only healthy, disease-free birds.

The flock of origin must have current, complete health records with no evidence of infectious disease. The originating flock should also be inspected and the records reviewed by a veterinarian to determine that there is no evidence of infectious disease. If any evidence of infectious disease is observed, the birds should be refused. Documentation of the vaccination record, flock health, and veterinary inspection of the incoming birds must be provided at transfer and be retained as a part of the receiving farm's Flock Health Record.

Birds should not be moved from one flock to another within four weeks of receiving a vaccination with a live virus vaccine. Similarly, birds from an originating flock should not be moved into a flock that has been vaccinated with a live virus vaccine within the previous four weeks. The vaccination protocol should be the same or very similar for both originating and destination flocks.

If additional birds must be added to an existing flock, this must be done in a careful manner. The source of the birds should be well known, and they must have complete health records. The vaccination program for the donor farm should be similar to that of the receiving farm. Also, birds should not be moved into a flock within four weeks of receiving a live vaccine. This is because, following vaccination, birds will shed vaccine virus for a period of time and this virus can cause illness in susceptible birds. A complete record of the introduced birds must be kept, including the source, number, and age of the introduced birds, the date of introduction, and complete health records, including the vaccination program. Because of the added "social" pressures for spiking males into a breeder flock, care must be taken in the management of this practice. A procedure for spiking males is presented in Appendix 9.

3.1.5 Implementing Enhanced Measures

Flock health is affected by a number of management factors besides biosecurity, including environmental control, feed supply, water supply, and even activities within the barn. Therefore careful attention to all management details will enhance flock health management. The basis for managing flock health is careful records that can help direct actions within the current flock and, perhaps more importantly, actions for future flocks. While mandatory flock health requirements include mortality records, enhanced measures will include more detailed mortality and health records, detailed feed records, water consumption records, a daily record of unusual activities or events (e.g. thunderstorms, equipment breakdowns, etc.).

Enhanced Mortality Records

Recording mortalities more than twice a day will enhance records and enable a more immediate response to a triggering event. A further enhancement would be to record mortalities by category. Categories will break down the types of mortality seen and will give additional clues as to the underlying cause of the problem. Such mortality categories can be easily observed and described by farm personnel:

Broiler Chickens

a. Flippers: large, well-conditioned birds usually found dead on their backs. These birds generally have feed in the crops, indicating that they have been eating well.
b. Culls: small, poor-doing birds that are removed by the farmer.
c. Legs: those birds that are removed by the farmer for leg deformities or other apparent disabilities.
d. Other: sick or dead birds that do not fit into the other 3 categories. This type of mortality is a signal that an infectious disease may be present in the flock

Turkeys

a) Culls: small, poor-doing birds that are removed by the farmer.
b) Legs: those birds that are removed by the farmer for leg deformities or other apparent disabilities.
c) Other: sick or dead birds that do not fit into the other 2 categories. This type of mortality is a signal that an infectious disease may be present in the flock.

Broiler Breeders

1. Replacement Pullets and Cockerels

a) Culls: small, poor-doing birds that are removed by the farmer.
b) Other: sick or dead birds that are not usual culls. This type of mortality is a signal that an infectious disease may be present in the flock.

2. Adult Birds

a) Culls: small, poor-doing birds that are removed by the farmer.
b) Legs: birds showing difficulty walking due to obvious leg problems.
c) Other: sick or dead birds that do not fit into the “Culls” or “Legs” categories. This type of mortality is a signal that an infectious disease may be present in the flock.

Table Egg Layers

1. Replacement Pullets

a) Culls: small, poor-doing birds that are removed by the farmer.
b) Other: sick or dead birds that are not usual culls. This type of mortality is a signal that an infectious disease may be present in the flock.

2. Layers

a) Culls: small, poor-doing birds that are removed by the farmer.
b) Other: sick or dead birds that are not usual culls. This type of mortality is a signal that an infectious disease may be present in the flock.

3.2 Mortality Management

3.2.1 Mandatory Standard #11

Poultry mortalities and cull eggs must be handled and disposed of in an approved manner.

3.2.2 Mortality Management Disposal Interpretive Guidelines

Dead birds and cull eggs may be a high-risk source of infectious disease organisms and must therefore be handled and disposed of in an approved manner.

a. Methods of mortality disposal are approved according to various provincial regulations as described in Section 3.2.3 below.
b. Producers must dispose of mortalities and cull birds and eggs in a manner that is consistent with provincial standards such as incineration or composting.
c. Disposal of mortalities and cull eggs on-farm is preferred to off-farm transport.
d. All mortalities transported off-farm must be placed in clean disinfected containers and the containers sealed prior to leaving the premises.
e. Large numbers of mortalities that result from a disease outbreak must be handled in a manner consistent with industry and government requirements.

3.2.3 Regulatory Requirements

Part 8 of the Agricultural Waste Control Regulation encapsulates all legal requirements for on-farm disposal of mortalities. The legal authority of this regulation stems from the Environmental Management Act and the Health Act.

In addition, Part 1, Section 33.1 of the Wildlife Act briefly touches on the issue of mortality management as it forbids feeding of mortalities to wildlife. Part 4, Section 23.1 of the Drinking Water Protection Act also gives additional legal authority to the position that burial is not an approved practice in areas with high rainfall, high water table and permeable soils.

Municipal Regulations may apply to some methods of disposal. The Health of Animals Act regulates disposal of carcasses infected with reportable infectious diseases.

3.2.4 Complying with Mandatory Standard

Note: This standard applies to all avian mortalities that are NOT caused by a Reportable Foreign Animal Disease (FAD). In those cases where avian mortalities are caused by a FAD, the Canadian Food Inspection Agency will stipulate appropriate disposal methods.

It is stated in the BC Agricultural Waste Control regulation that mortalities may only be managed through on-farm methods **if:**

a) the mortalities are domestic birds that are being disposed of on the farm where they died
b) escape of any liquids or solids that has been in contact with the mortalities can be prevented
c) physical barriers are put in place to prevent any access to mortalities for wild birds, rodents and other potential vectors

The on-farm disposal methods that are approved by the BC Agricultural Waste Control Regulation are composting, incineration and Burial. Burial is only an accepted on-farm disposal practice in areas with low rainfall and suitable ground water tables. In addition, utilization of a pick-up service for centralized disposal options such as rendering, composting or incineration are acceptable practices provided that the receiver is certified to deal with mortalities and has all relevant permits in place for the centralized facility.

If disposal does not occur immediately after the collection of mortalities the dead stock must be intermittently stored in an approved manner. The approved storage methods are:

1. impermeable covered storage bins if the storage period is short;
2. freezing in sealed bags for longer storage periods.

Specifically, the use of approved disposal and storage methods aims to ensure that all leaking fluids and dust caused by mortality management is contained at the site of disposal and does not enter the surrounding soil, water or air. It is also essential that no mortalities or poultry processing waste is mixed in with manure in order to avoid off-farm transport of un-treated bird carcasses together with manure loads. Open- or air curtain burning is not allowed as an on-farm disposal method unless a specific provincial permit exists for this practice. Further more, such practices as dumping of mortalities or poultry processing waste into liquid manure pits as well as feeding it to scavengers are disallowed under this mandatory standard.

Handling Mortalities

In-Barn Collection

a) Mortalities should be collected on at least a daily basis and examined for signs of disease. This includes external parasites.
b) Mortality spikes or steady increases should be reported to a veterinarian.
c) A CFIA veterinarian must be notified upon suspicion of a reportable disease.
d) Mortality collection vessels should not be shared between barns – each barn should have its' own clearly identified vessel with a tight fitting lid.
e) After collection of mortality, collection vessel(s) should be sealed and removed from the barn immediately.
f) Remember to use disposable gloves and wash your hands with hand sanitizer.

Storage

a) Carcasses should be covered or placed in a secure container, which does not allow escape of feathers or organic matter, immediately after collection and not be left exposed to the environment.
b) Mortalities must be stored inside the Controlled Access Zone (CAZ) and away from water or feed sources. (CAZ, as stipulated by the CFIA biosecurity standard, is a zone surrounding all structures on the farm, including the barns and ranges. The minimum width of the zone is 15 meters. This distance may vary according to individual farm set up and/or species present.)
c) Carcasses to be frozen should be bagged and sealed immediately after collection

d) If mortalities are to be stored before disposal, storage should be considered only for short time periods (several hours). Disposal treatment should be undertaken as soon as possible.
e) Storage area must be free from flies, rodents, and other pests
f) Disposal of mortalities should occur on the same premise as the barn(s) and not moved to another premise
g) Whenever mortalities are moved off the premise where they died, they MUST be in sealed containers during transit as mentioned above.
h) Clean and disinfect the mortality storage vessel regularly.

Mortality Disposal

General

a) Mortalities may be disposed inside the Controlled Access Zone. Where mortalities are not disposed within the Controlled Access Zone, the area in which they are stored should be clearly identified with restricted access signage and no one should enter the area without taking proper biosecurity measures.
b) Mortalities should not be disposed of near water or feed sources.
c) Mortality disposal areas should be down wind of flock rearing zones (prevailing wind).

Composting

a) Composters should:
    - be of a design and be operated in a manner to ensure proper composting temperatures are attained and full and rapid decomposition of carcasses occurs.
    - be checked for proper internal operating temperature (40 – 60 degrees Celsius) twice per week
    - not allow exposure of carcasses to disease vectors such as flies, birds, rodents, or other animals.
b) Personnel should not re-enter the barns after entering the composting area without implementing full biosecurity measures such as those described in farm entry protocols (Appendix 2).

Incineration

a) The area in which incineration takes place should be clearly identified with restricted access signage. No one should enter the area without taking proper bio-security measures.
b) The capacity of the incinerator should be pre-determined and displayed in the view of the farm employee in order to prevent exceeding capacity.
c) Ensure complete incineration each run.
d) Keep incinerator clean and maintained.

Burial

a) On-farm burial is prohibited if any of the following points apply to the area:
    - More then 600 mm annual precipitation
    - Less the 1 m depth to ground water during season high ground water level
    - Shallow soils over bedrock or coarse soils such as gravel
b) Burial is not an approved practice for the Fraser Valley due to the above stated limitations
c) Buried carcasses must be covered immediately with a sufficient soil cover to exclude birds, rodents and other scavengers.

Guidelines for Approved On-farm Methods of Handling and Disposal of Avian Mortalities

Storage

The aim should be to limit storage of mortalities to a minimum. All stored mortalities must be placed in secured containers that prevent both access of wildlife and the escape of liquids, aerosols, solids and odour. Storage units should be sized to accommodate the normal maximum volume of mortality to be expected in the interval between emptying.

Short Term Storage

Short term is here defined as up to 24 hours. For longer storage durations freezing is required.

Ideally, average daily losses should be dealt with continuously through composting, incineration or burial unless a pick-up service is used, in which case the carcasses should be stored in a freezer. However, for practical reasons carcasses may have to be stored for a shorter period of time before being added to the compost bin, the incinerator or the burial trench. In this case the carcasses must be stored in a sealed container that is rigid enough to deny entry for rodents and other scavengers. Carcasses must under no circumstances be stored together with manure in an open-air manure storage facility.

In the event of catastrophic loss due to for example loss of ventilation capacity, the carcasses are best stored in the barn where they died until proper arrangements for their disposal has been made. In this case, in barn storage may be acceptable for longer then 24 hours since freezing would most likely not be a practical or even possible alternative.

Freezing

The freezer unit design, construction, power source, and unit installation should be in accordance with manufacturer's recommendations. The freezer container should be leak-proof to minimize escape of odor, leachate and aerosols. Where needed, the freezer ought to be placed on a pad of suitable strength to withstand loads imposed with vehicular traffic consistent with equipment used to load or remove the box or tray. Provisions for protecting the freezer unit from precipitation and direct sun are beneficial.

An alternative source of power, where available, should be used to maintain the integrity of the freezing process during power outages. There should be a contingency plan for alternative handling and disposal methods in place where an alternative power source is not available.

The following procedures should be followed with respect to freezer:

- The area in which the freezers are located should be clearly identified with restricted access signage. No one should enter the area without taking proper bio-security measures.
- After packing in sealed plastic bags, carcasses should be placed in the freezer immediately.
- Mortality collection service providers should not pick up farm mortality directly from the farm freezer.
- Farm mortality should be taken to, and left at a designated pick up point well away from the barns and production area.
- Mortalities left for pick up should be stored in a vessel impervious to animals and weather.

Burial

Choosing an appropriate site for Burial Pits is important to minimize risk to the environment. The following guidelines assist in assessing possible burial sites to ensure that ground water and surface water resources are protected. The burial information is taken directly from B.C. Ministry of Agriculture and Lands factsheet 384.300-3. For a full description of the subject including footnotes please follow the above given link to the source material or order the fact sheet by phoning Ministry of Agriculture and Lands (604) 556-3100.

Site Selection

1. Assess Ground Water Contamination Potential

Potential ground water contamination can be assessed by looking at the soil type, soil depth and depth to ground water.

- Soil Type: Coarse soils such as sand and sandy loam increase the risk of ground water contamination because they allow rapid transport of liquids away from the burial site.
- Soil Depth: Soils that are very shallow overlying bedrock or coarse rock and gravel permit rapid movement of contaminated water with minimal filtration or treatment.
- Depth to Ground Water: The zone above the ground water table, up to the soil surface, is effective in destroying some biological contaminants. However, this zone is minimal in areas where the water table is high. In all cases, it is recommended that burial pits be located one meter above the seasonal high ground water table.[3]

Burial of large animals, or large volumes of animals, over unconfined aquifers such as the Abbotsford – Sumas or Hoppington Aquifers is not recommended. Use Table 1 to assess ground water contamination potential. Water table depths may be available through regional authorities or the B.C. Ministry of Agriculture and Lands.

Soil Type	**Depth to Watertable from Bottom of Pit**			
	< 1 m	**1 – 5 m**	**5 – 15 m**	**> 15 m**
Soil depth less than 1 metre	**N/A**	**1**	**1**	**1**
Muck or peat soils	**N/A**	**2**	**3**	**3**
Sand with fast natural drainage	**N/A**	**1**	**1**	**2**
Sandy loam with moderate natural drainage	**N/A**	**1**	**2**	**3**
Clay loam with slow natural drainage	**N/A**	**2**	**3**	**4**
Clay with very slow natural drainage	**N/A**	**3**	**4**	**4**
Numbers in shading refer to ground water contamination potential				
N/A not allowed under regulation **1** high potential for contamination – do not bury **2** moderate potential for contamination – not recommended, select a better site **3** low potential – location suitable for burial from a ground water protection perspective **4** very low potential – location suitable for burial from a ground water protection perspective				

Table 1. Ground Water Contamination Potential Based On Soil Type And Depth To Watertable

Table is modified version of a source from Ontario Ministry of Agriculture and Food

2. Assess Surface Water Contamination Potential

A burial site should not be located where soil is easily eroded off the carcass. This may mean that burial sites on a slope (where there are fine-textured soils and/or rapid runoff) may not be suitable. Burial is not recommended adjacent to surface water bodies, or in low areas where surface water will collect.

3. Assess Distance to any Water Source used for Domestic Purposes

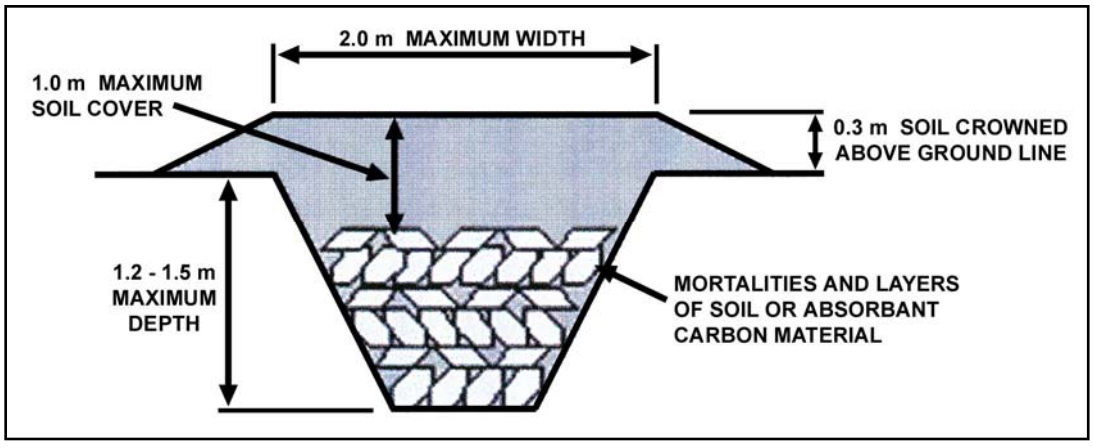
A burial site should be located no closer than 40 m (122 ft) to a well or at least 30 m (100 ft) from any source of surface water used for domestic purposes. For areas with high ground water contamination potential, it is recommended that the burial site be located a greater distance from a well or any source of water used for domestic purposes.

Burial Pit Design

Pits need to be about 1.2 – 1.5 meters (4-5 ft) below the original ground level. There needs to be a cover of at least 1.0 m (3 ft) of packed soil over the mortalities and a mound of 0.3 m (1 ft) packed soil above the original ground surface level to help shed water so it does not collect in the pit (see Figure 22).

High carbon material such as shavings or sawdust can be used to line burial pits that are located in an area with ground water contamination potential of 2 (see Table l) to make them less of a pollution risk. Lining the pits with approximately 15 cm (6 in) of high carbon material may speed the decomposition process, and may help attenuate potential contaminants.

Apply a layer (up to 10 cm (4 in)) of agricultural or hydrated lime4 over a carcass can help reduce odours and potential scavenging.



Source: Modified from Ontario Ministry of Agriculture and Food

Figure 22 Graphic Representation of A Burial Pit Designed for Avian Mortality Disposal

Composting

Bin Composting

In sizing a poultry composter, it is necessary to know, or estimate, the number and weight of birds in the enterprise, and the percent daily mortality expected. Maximum daily mortality on a weight basis usually occurs when birds are at or near market weight. Once the maximum daily mortality weight is known the number and size of compost bins can be calculated. See Mortality Compost Bin Design, B.C. Ministry of Agriculture and Lands Factsheet No. 382.500-10, for construction information. The Mortality Compost Bin Design factsheet is part of a whole series of useful composting factsheets that can be found on the Resource Management Branch website at http://www.agf.gov.bc.ca/resmgmt/publist/Waste_Mgmt.htm or telephone Ministry of Agriculture and Lands at (604) 556-3100.

Poultry composting can be accomplished by placing a 300 mm (12 in) layer of dry poultry litter in the bottom of a bin as shown in Figure 23. When carcasses release excess moisture, this absorptive base layer helps prevent escape of highly odorous leachate that also poses an environmental and biosecurity risk.

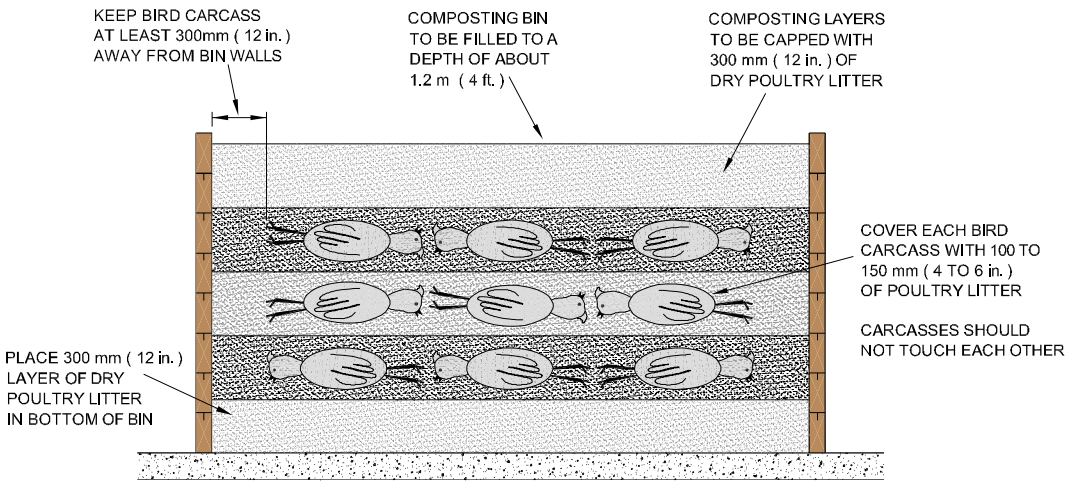


Figure 23 Layering of Carcasses

Carcasses are placed on top of the base layer at least 300 mm (12 in.) away from bin walls. Placement closer than this can lead to seepage of liquid through the walls. Keeping carcasses away from side walls also helps to maintain them at temperatures that speed decay and kill disease-causing microorganisms. Carcasses should not touch each other; too many carcasses in one spot leads to localized wet spots and poor composting.

After the carcasses are positioned inside the bin, they are to be immediately covered with 100 to 150 mm (4 to 6 in) of poultry litter. Incomplete coverage can lead to fly problems. Another layer of carcasses can then be added on top of the cover. Again, the new carcasses are to be immediately covered as described above.

Layering of carcasses and poultry litter continues until the bin is filled to a depth of about 1.2 m (4 ft), at which point it is capped with 0.3 m (12 in) of dry poultry litter. In a properly operating compost operation, new material added to the bins reaches temperatures of 50 to 65 ºC within 24 to 48 hours.

After a bin is completely filled, it must undergo a primary heating phase lasting 10-14 days, after which temperatures may begin to fall. Following the first phase, the partially composted waste is removed from the primary bin and placed in a secondary bin. The mechanical action of moving the compost breaks up the pile, redistributes excess moisture, and introduces a new oxygen supply. Once this takes place, a secondary heating cycle occurs, accompanied by further decomposition.

By the end of the secondary heating phase, carcasses as large as 7 to 9 kg (15-20 lb) are normally reduced to bones that are reasonably clean and free of tissues that cause odors and attract insects and predators.

Temperature is a good indicator of the "health" of the compost process. A probe-type dial thermometer with a 1 m (36 in) stem is a good instrument for monitoring temperatures in bins. Temperature should be checked daily to ascertain the condition of the compost. Normally, temperatures in the primary bins should rise to the 55-65 ºC range in one or two days, and should peak in the 60-70 ºC range in 7 to 10 days. Temperature is an important parameter in the control of fly larvae and pathogens. Typical temperature profiles for primary and secondary compost phases are shown in Figure 24.

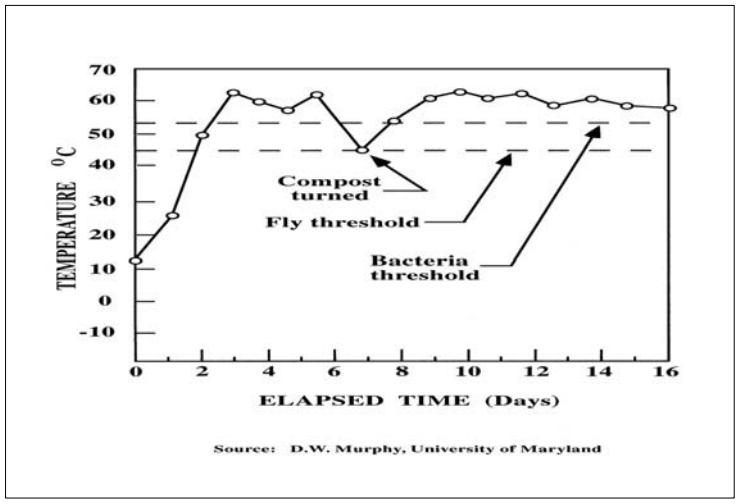


Figure 24 Bin Composting Temperature Profile

Although experience indicates that temperatures above 75 ºC are rare, a remote possibility exists that temperatures could rise to spontaneous combustion levels. Conditions conducive to spontaneous combustion occur in damp, deep-piled, compacted masses of organic matter. Experience indicates that compost piles limited to 1.5 m (5 ft) in depth, with the proper porosity and moisture levels, do not present a fire hazard. Nevertheless, the potential for spontaneous combustion should be kept in mind as temperatures are monitored.

In-Vessel Composting

Instead of the bin composting system it is possible to opt for a more automated in-vessel composting system. In-vessel composting is the production of compost in drums, silos or channels using a high-rate controlled aeration system, designed to provide optimal conditions. In-vessel composting represents a high technology and low labour approach, producing a uniform product. An example of a so-called rotary drum-composting vessel can be seen in Figure 25.

The main advantages of the in-vessel system over bin composting systems are the shortening of the composting process, higher process efficiency, and a decreased number of pathogens, resulting in a safer and more valuable end product. As well, the space requirement is generally less than for bin composting and the material is more protected against rodents, birds and other scavengers.

Figure 25
In-Vessel Rotary Drum from Industrial Piping Inc.

Disadvantages of the enclosed vessel method include high capital and operational costs due to the use of computerized equipment and skilled labour. In-vessel composters are generally more automated than windrow or static pile systems, and can produce a top quality finished product on a consistent basis.

Incineration

The quickest and most contained way to dispose of carcasses is incineration. It is also the most cost intensive of the on-farm disposal options. Incinerators utilize an energy source such as propane gas, natural gas, or diesel fuel with forced air in a combustion chamber(s) to reduce animal mortalities to ashes. When properly operated, incinerators prevent the emission of objectionable odours and excessive amounts of particulate matter. When purchasing an incinerator for use on-farm, make sure that the manufacturer warrants that the device generates less then 180 mg/m3 of particulate matter and less the 20 % opacity when properly operated (BC Agricultural Waste Control Regulation).

Stationary On-farm Incinerator

Stationary on-farm incinerators are usually designed to handle normal mortalities on a once a day basis (see Figure 26). Heavy mortalities near the end of a grow-out cycle may require loading the incinerator more than once a day. Some operations will require the use of more than one incinerator.

Figure 26 Examples of a Stationary On-farm Incinerator

A diesel fuelled low-tech incinerator will require from 4 to 12 litres of fuel per 50 kilograms of carcass. Please refer to B.C. Ministry of Agriculture and Lands Factsheet 210.510-1 for up to date information on rules regarding on-farm storage and handling of petroleum products.

Stationary incinerators should be built on a stable base, preferably concrete or asphalt. A roof structure to shield the unit from rain will greatly increase the lifespan of the equipment. The incinerator should also have a timer or other automatic shut-off so that when the carcass is consumed the burners shut off. Make sure to provide for optimal burn conditions for each batch otherwise, smoke generated from incinerating may generate complaints from neighbours.

The ash produced by the incinerator should be evenly distributed on an actively growing crop as a fertilizer or soil amendment in accordance with BC Agricultural Waste Control Regulation.

Mobile High Capacity Incinerator

Mobile incinerator units are available up to a capacity of 450 kg (1000 lbs) per hour. Due to the high capacity a mobile high capacity incinerator would be able to handle massive bird losses in single barns in a timely manner. This is an efficient, high-tech solution to the mortality issue but the high capital investment is most likely prohibitive for the individual producer. For this reason mobile incinerator units are normally cooperatively owned and maintained.
The unit consists of a trailer mounted, enclosed, continuously fed, double combustion chamber incinerator. Any cooperative ownership consortium should make sure that the mobile unit has a minimum main- and secondary chamber combustion temperature of 870 °C and 1000 °C respectively. If these temperatures are achieved, the mobile high capacity incinerator could also be used for on-farm disposal of avian influenza virus infected birds in the event of an outbreak that is limited to a small number of barns.

The following equipment is recommended for on-farm disposal using a mobile, high capacity incinerator:

- Fuel source for the incinerator unit such as propane or natural gas. Propane is best unless a natural gas infrastructure is available on site.
- Two generators, one onboard for powering the process and one emergency generator on standby if the first one fails.
- Concrete pier blocks work to be placed around propane/natural gas tubes to prevent collisions.
- Enclosed container for storage of ash if the ash is to be spread on land or a vacuum truck if the ash is to be land filled.

If the mobile incinerator unit is to be used to dispose of notifiable avian influenza virus infected birds a special protocol provided by CFIA must be used.

4. Farm Management Standards

Farm Management Biosecurity Concerns

Farm management is the essential component of putting the standards into practice. If all aspects of management are handled to their optimum, then farm biosecurity will be a success. All the technology put into place then managed incorrectly, however, will be equivalent to not having biosecurity measures in place. Farm management is a collection of programs, procedures, and rules that are put into place to activate an overall biosecurity program.

4.1 Pest Control

4.1.1 Mandatory Standard #12

An effective pest control program must be in place.

4.1.2 Interpretive Guidelines

Maintain Premises to Reduce Pest Infestations

Pests are active and passive disease transmitting vectors. Minimizing pest populations will reduce the risk of disease transmission

Interpretive Guidelines:

a. Premises should be maintained in a manner that minimizes pest infestations.
b. Rodent and insect control programs that are designed to reduce existing pest populations and prevent further establishment of new pests must be documented.

4.1.3 Regulatory Requirements

1. Applicable Municipal Regulations
2. Health of Animals Act
3. Environmental Management Act
4. Pest Control Products Act (federal)
5. Integrated Pest Management Act (provincial)

4.1.4 Complying with Mandatory Standard

Pests are important potential disease carrying vectors. Minimizing pest populations will reduce the risk of disease transmission. Premises should be maintained in a manner that minimizes pest infestations including the proper storage of feed, the elimination of water leaks, and generally good housekeeping measures such as removing debris, recycling old tires and equipment as well as ensuring that temporary garbage storage is secure. Additionally, a targeting control program that eliminates or reduces populations of rodents and insects must be in place and documented.

Example of Good Housekeeping – No Debris

Rodents

1. Rodent proof buildings, repair visible damage as it occurs.
2. Rodent proof feed storage.
3. Clean up feed spills immediately.
4. Employ regular baiting (follow label instructions) or trapping. Adapt your pest control program to activity and seasons. See Appendix 10 for a detailed description of Pest Control. Dispose of rodent carcasses immediately. Carcasses should be handled while wearing gloves and disposed of so as to prevent access by pets or wildlife, such as by incineration.
5. Document the rodent control program in a Standard Operation Procedure (See Appendix 5 for an example SOP).

NOTE:

USE EXTREME CAUTION WHEN USING PEST CONTROL MEASURES AROUND CHILDREN, PETS, AND OTHER ANIMALS !

Insects

1. Eliminate or control fly-breeding areas (wet manure, decaying birds, low lying areas or potholes where stagnant water can accumulate, etc.) especially in warm weather.
2. Remove mortality from the barn at least once a day and dispose of in a manner acceptable under the Environmental Management Act, Health Act, and Agriculture Waste Control Regulations.
3. Apply insecticides as necessary (misting, residual sprays, at clean out). See Appendix 10 (Pest Control) for more details. Also see Management of Flies in Layer Barns in Appendix 10.
4. If spraying for flies, clean up all dead flies regularly.

Wild Birds

1. Screen all openings into the barn.
2. Do not put out wild bird feeders.
3. While trees may be used for dust control on the exhaust side of a barn, the number and type of trees used should be limited. Eliminate any unnecessary trees and shrubbery that is close to the barns.

Trees and Shrubs Kept Away from Barn

4.1.5 Implementing Enhanced Measures

A routine pest control program designed and supervised by a pest control specialist may be an enhancement over a self-directed program. While a generic control program may be effective in reducing pest populations, the understanding of the biology of the various pests of concern that a professional would bring to the program should result in much more effective control.

Keeping wild birds from mingling with free-range flocks can prevent the risk of entry of a disease organism. Netting placed over the enclosure, which would be considered an enhanced measure, will provide a barrier to wild birds while still maintaining the integrity of the free-range status.

4.2 Protection of Feed and Water from Contamination

4.2.1 Mandatory Standard #13

A management program that prevents the contamination of feed and water sources must be in place.

4.2.2 Interpretive Guidelines

Contamination from the external environment may introduce and/or transmit disease.

Interpretive Guidelines:

a. Premises should be maintained in a manner that minimizes environmental contamination including, but not limited to, the proper storage of feed, the elimination of water leaks, the maintenance of water quality and generally good housekeeping measures such as the removal of debris.

4.2.3 Regulatory Requirements

1. Applicable Municipal Regulations
2. Environmental Management Act
3. Drinking Water Protection Act

4.2.4 Complying with Mandatory Standard

Feed must be stored in clean, closed bins that prevent access by pests and prevent water and debris from entering. The concrete pad and area beyond must be kept free of debris, especially spilled feed, and all foliage, including grass and weeds, must be kept trimmed.

Wells should be properly constructed and maintained. Water quality should be checked on a routine basis. Water analysis reports should be kept with the farm records.

Clean Feed Storage Area

4.2.5 Implementing Enhanced Measures

A clean and uncluttered environment around the feed and water sources is a minimum standard, and it is difficult to enhance that situation. However, changes that make that process easier could be considered and enhancement. Such changes could include a wide paved or concrete drive (see section 1.3.5) around the barn and feed equipment. This would effectively prevent any growth of vegetation or pooling of water and would be easier to clean in the event of spills of any kind.

Clean and Uncluttered Feed and Water Source Area

4.3 Cleaning and Decontamination of Equipment

4.3.1 Mandatory Standard #14

All equipment and materials related to the production of poultry that enter or leave the Controlled Access Zone, regardless of size or use, must be clean and decontaminated.

4.3.2 Interpretive Guidelines

Visible accumulations of organic matter can harbour infectious organisms, allowing their transport onto or off of the premises. These accumulations must be removed to reduce the risk of disease transmission.

a. All equipment and materials related to the production of poultry and poultry products that are not visibly free of organic matter accumulations must not enter or exit the primary or secondary access.
b. Recycled poultry related equipment such as egg pallets, catching crates, sawdust pipes and manure handling equipment is considered high risk and should be treated appropriately.
c. Producers are encouraged to conduct business with allied trades that have adopted biosecurity practices complementary to the BC Poultry Biosecurity Program and the relevant standards.

4.3.3 Regulatory Requirements

1. Applicable Municipal Regulations
2. Environmental Management Act
3. Drinking Water Protection Act
4. Fisheries Act

4.3.4 Complying with Mandatory Standard

Visible accumulations of organic matter can harbour infectious organisms, allowing their transport onto or off of the premises. These accumulations must be removed to reduce the risk of disease transmission. While the standard relates to equipment and materials, it is understood that similar care must be given to cleaning and sanitation of the barn and anteroom as well.

All equipment and materials related to poultry and poultry products production (such as egg flats and pallets) must be visibly free of organic matter accumulations; if not, such equipment and supplies must not pass beyond the primary access. Recycled poultry related equipment such as egg pallets, catching crates,

Clean Production Area

sawdust pipes, and manure handling equipment is considered high risk and should be treated appropriately. Producers are encouraged to conduct business with allied trades that have adopted biosecurity practices complementary to the BC Poultry Biosecurity Program and the relevant standards.

Cleaning and disinfection procedures should be outlined in a Standard Operating Procedure (SOP), and a record of such procedures should be kept in the facilities log book.

REMEMBER:
YOU CANNOT DISINFECT DIRT !

Disinfection refers to the reduction of pathogens (disease causing organisms), while sanitation refers to the quality of cleanliness. Good sanitation is a key factor to the success of a Biosecurity program. Disinfectants have little effectiveness on vehicles, equipment and facilities to which they are applied unless they have been thoroughly cleaned. Organic matter can form films that protect organisms against germicides. There are many good detergents on the market that can aid in removing organic matter from surfaces. **Cleaning before the application of the disinfectant is essential!** Please note that any equipment repairs or upgrades should be done prior to disinfection. Successful disinfection has 2 components:

1. direct physical contact of the chemical disinfectant with the organism
2. length of time of contact

Complete disinfection procedures for barns and equipment are presented in Appendix 3.

4.3.5 Implementing Enhanced Measures

In order to be effective, cleaning and disinfection must be carried out properly; there is no enhancement of this procedure.

4.4 Manure Management

4.4.1 Mandatory Standard #15

All farms must have a documented manure management strategy.

4.4.2 Interpretive Guidelines

Manure can be a high-risk source of disease transmission. The strategy for manure management can therefore be critical in the event of a disease outbreak.

a. A manure management strategy will, at a minimum, document how the manure was utilized and/or who transported it from the farm.

4.4.3 Regulatory Requirements

1. Applicable Municipal Regulations
2. Environmental Management Act
3. Drinking Water Protection Act
4. Health of Animals Act

4.4.4 Complying with Mandatory Standard

Manure handling must be documented. The minimum requirement is documentation of the handling of the manure on-farm or the transfer of the manure to a company transporting it from the farm, including the name of the company and the date of removal.

4.4.5 Implementing Enhanced Measures

All manure handling must be documented. While the minimum standard is documentation of its removal, on-farm composting prior to any removal would be an enhancement. Composting must be implemented according to local environmental standards. In any case, raw manure should not be spread on fields.

Improper manure storage may also provide a biosecurity risk. The manure storage area should be at least 15 metres from the barn and may be inside or outside the Controlled Access Zone. If outside the Controlled Access Zone, it should be situated in such a manner that when it is removed, it does not re-enter the zone. Stored manure should be protected from inadvertent access by vehicles, equipment, or animals, whether it is inside or outside the Controlled Access Zone.

Cleaning out barns and handling manure is a potential biosecurity risk in itself. Therefore, care must be taken when manure is handled for removal or composting. Good management procedures associated with manure handling are outlined in Appendix 11.

Dust control is not covered under mandatory standards at this time, but dust vented from barns can be considered a by-product of poultry and manure production and is a biosecurity risk to other barns on the farm or to neighbouring farms. Any steps taken to reduce dust carried from barns are, therefore, enhanced biosecurity measures. Recent studies by the B.C. Sustainable Poultry Farming Group have shown that exhaust dust can be effectively controlled with a belt of trees placed along the exhaust side of the barn. Excelsa Cedar trees were planted at 8-foot intervals approximately 40 to 45 feet from the exhaust fan and a second row 8 feet beyond the first row. Suspended particles were measured after each row of trees. Total suspended particles were reduced by an average of 56% after the first row and an average of 69.5% after the second row. Survivability of the trees is improved if they are planted at least 30 feet away from the fans. Placement of trees for this purpose varies with farm conditions; therefore, it is advisable to contact the B.C. Sustainable Poultry Farming Group to find assistance in proper design of a shelterbelt.

4.5 On-farm Biosecurity Training for Producers and Farm Employees

4.5.1 Mandatory Standard #16

On-farm biosecurity training is required for all producers and farm employees.

4.5.2 Interpretive Guidelines

In order to achieve the intent of the standards it is essential that producers and employees understand the reasons for the standards and their ability to affect the level of biosecurity attained on the premises.

a. An on-farm biosecurity training program must be in place.
b. On-farm biosecurity training is an on-going requirement with the need to update farm personnel and train new personnel at regular intervals.

4.5.3 Regulatory Requirements

None.

4.5.4 Complying with Mandatory Standard

In order to achieve the intent of the standards it is essential that producers and employees understand the reasons for the standards and their ability to affect the level of biosecurity attained on the premise. With appropriate training, the practices become second nature and will provide a solid basis for a successful program. Additionally, well-trained staff will be able to recognize deficiencies in the program and be a valuable resource for ongoing improvement.

The facility Standard Operating Procedures can form the basis for the training sessions. Any resource material within the Reference Guide can also be used, plus related materials from other sources. A record of all the training sessions, including a list of those participating, should be kept in the facilities log book.

New Employees

All new employees should be required to review the Standard Operating Procedures. They should be provided with a copy of the SOP's and required to review them before their first day of work. On the first day of work, the new employee should again be briefed on the SOP's that will apply to his or her area of responsibility and be allowed to ask questions.

Ongoing Training

Routine reviews of procedures and SOP's should be carried out. For example, once a month select an appropriate SOP (e.g. barn cleaning and disinfection procedure as the time for shipping birds approaches) for review. This would provide an appropriate time for reinforcing the procedure and a time to discuss and point out possible areas for improvement.

All farm personnel should be encouraged to attend continuing education seminars that may be offered off the farm.

4.5.5 Implementing Enhanced Measures

The minimum biosecurity training would entail a review of SOP's carried out routinely. Encouraging farm personnel to attend poultry seminars, such as may be offered locally by the B.C. Ministry of Agriculture and Lands or by veterinarians, or more extensive programs such as the Poultry Service Industry Workshop would be a definite enhancement to the training program.

4.6 Standard Operating Procedures

4.6.1 Mandatory Standard #17

Standard operating procedures (SOP) for on-farm biosecurity must be available.

4.6.2 Interpretive Guidelines

Standard operating procedures recognize that biosecurity is an on-going activity and provide processes for maintaining biosecurity standards and assist with biosecurity training.

Standard operating procedures will include but not be limited to:

- Self quarantine procedures
- Farm access procedures for employees, allied trades and visitors
- Primary and secondary access maintenance scheduling
- Cleaning and decontamination site operation and maintenance
- Controlled access zone housekeeping procedures
- Anteroom procedures and housekeeping
- Building cleaning and disinfection procedures
- Pest control program
- Biosecurity training approach
- Mortality disposal procedures
- Manure management strategies
- Scheduling for the review and updating of standard operating procedures.

4.6.3 Regulatory Requirements

None.

4.6.4 Complying with Mandatory Standard

Standard operating procedures (SOP) are a recipe-like description of the procedures to be followed when implementing various elements of the biosecurity program. There are several advantages to having a detailed SOP for each important task that is carried out routinely. First, by having it committed to paper, it adds a level of responsibility to the proper implementation of the procedure, especially for hired farm personnel. Second, it maintains consistency from person to person, so, if a new employee is hired, he or she will carry out the procedure in the identical manner to all other personnel. Third, the SOP provides a useful training document for new employees and a review document for existing personnel.

The SOP should be an ever-improving document. If someone identifies an easier or more efficient manner by which the purpose of a procedure can be met, then the SOP should be revised. Also, new technologies or new equipment may necessitate a change in a SOP.

Example SOP's are presented in Appendix 5.

4.6.5 Implementing Enhanced Measures

Standard Operating Procedures are extremely useful documents that do not need to relate only to biosecurity. SOP's for other procedures, from bird handling procedures to equipment maintenance would be enhancements over the basic requirements.

4.7 Visitor and Activity Log Book

4.7.1 Mandatory Standard #18

An activity log book for the premises that records visitors and daily on-farm activities relevant to the biosecurity standard operating procedures must be maintained.

4.7.2 Interpretive Guidelines

In the event of a disease outbreak the activity log book for the premises will provide critical information to assist in containing the outbreak. The premises log book will also provide documentation verifying that biosecurity standard operating procedures are being followed.

The activity log book for the premises will regularly document activities including but not limited to:

- Primary access, secondary access and Controlled Access Zone maintenance.
- Cleaning and decontamination undertaken including barn sanitation and dust management.
- Pest control measures undertaken.
- All visitors and allied trades entering Controlled Access and Restricted Access Zones (allied trade documentation such as feed slips and/or invoices with date and personal entering the zone may serve as CAZ or RAZ documentation).
- Biosecurity training undertaken.
- Flock health diagnostic reports, treatments and mortality.
- The name of company or individual transporting manure off the farm and, where known, the receiver.

4.7.3 Regulatory Requirements

None.

4.7.4 Complying with Mandatory Standard

A log book will record all day-to-day activities and events, information that can serve as a basis for understanding problems on the farm, provide an historical reference for comparison of a current flock with past flocks, and, in the worst case, provide essential information for tracking a Foreign Animal Disease, should such an outbreak occur. The log book will also provide the record of implementation of various biosecurity procedures including cleaning and disinfection of equipment and barns, pest control protocols, etc.

A log book does not need to be complicated, but should be complete. With appropriate headings and tabulations, it can be very easy to use. Each visitor, service call, feed delivery, etc. should be documented as it occurs. When this is not possible, the farmer should enter details at least once daily. After this time, it is very easy to forget what has occurred. Feed deliveries can be documented with delivery slips, but the delivery details (date, truck or driver) should be routinely entered into the log book.

Various examples of log book layouts are presented in Appendix 1.

4.7.5 Implementing Enhanced Measures

There is no enhancement for a well-maintained log book.

4.8 Multiple Species within a Controlled Access Zone

4.8.1 Mandatory Standard #19

No unlicensed avian species or porcine species may be kept within a Controlled Access Zone or a Restricted Access Zone where licensed production is occurring.

4.8.2 Interpretive Guidelines

Domesticated birds and porcine species may harbour infectious diseases that can increase the risk of disease transmission to chickens and turkeys.

a. Chickens and Turkeys must not be raised on bedding that was previously used for rearing waterfowl.
b. Where any waterfowl are raised in a barn followed by a flock of chickens or turkeys in the same barn (Restricted Access Zone), the producers' standard operating procedure mush clearly describe the extra measures, such as manure removal, thorough cleaning, disinfection, and drying that will be undertaken to minimize the risk of disease transmission to any subsequent licensed production.
c. All birds, particularly waterfowl, should be discouraged from entering the Controlled Access Zone.
d. All birds, other than those being reared for commercial purposes, must be prevented from entering the Restricted Access Zone while production is underway.

4.8.3 Regulatory Requirements

1. Applicable Municipal Regulations

4.8.4 Complying with Mandatory Standard

Under no circumstances can chickens and turkeys be raised on bedding that was previously used for rearing waterfowl, regardless of whether the previously used bedding was in the barn or imported for use within a barn. Raising waterfowl in a barn where chickens or turkeys are expected to follow is not a recommended practice and is strongly discouraged for biosecurity reasons. In the event that a producer decides to rear chickens or turkeys following waterfowl, the producers' standard operating procedures must clearly describe the extra measures, such as manure removal, thorough cleaning, disinfection and drying that will be undertaken prior to introducing chickens or turkeys. These procedures will need to be thoroughly implemented in order to minimize the risk of disease transmission to any subsequent licensed production.

All birds, but particularly waterfowl, should be discouraged from entering the Controlled Access Zone and all birds, other than those being reared for commercial purposes, must be prevented from entering the Restricted Access Zone while production is underway.

4.8.5 Implementing Enhanced Measures

Maximize the separation distance and avoid all contact between waterfowl and any licensed production. Do not raise any other species within a Controlled Access Zone or Restricted Access Zone that is intended for production of chickens or turkeys, even when no licensed species are present on the premises.