

BIOSECURITY OF POULTRY FACILITIES

Disease outbreaks cost poultry producers and related industries millions of dollars a year in lost revenue. To minimize these losses, disease prevention methods, including practices which control disease causing organisms (pathogens) and their vectors, must be followed. Such disease control measures are collectively termed biosecurity.

Biosecurity can be defined as a set of practices that, when followed, will limit the spread of disease causing organisms from one location to another. Biosecurity practices are teamed up with disinfection and sanitation procedures to either eradicate or reduce pathogens to non-infectious levels. Preventative measures such as vaccination, and serologic monitoring also help insure good flock health. Inadequate biosecurity can contribute to industry wide epidemics of highly pathogenic or exotic disease, resulting in quarantine and possible condemnation of flocks. On the other hand, an endemic infection of a facility by a nonvirulent organism can be just as economically devastating due to the decrease in production over the life of the facility, although there are no overt signs of disease. It is extremely difficult and expensive to clean, sanitize, and disinfect poultry facilities once they have become contaminated with pathogens.

Conscientious facility location and design will promote biosecurity

Optimally, facilities should be located at least 1 to 3 kilometres from other commercial or private poultry facilities. Although existing facilities can not be relocated, avoid building new facilities near waterways utilized by migratory waterfowl. New facility sites should also be selected to maximize the distance from roads that handle a high volume of poultry vehicles, such as feed trucks or live-haul vehicles. Poultry facilities also need adequate amounts of potable water. In addition, there must be an approved method for the timely treatment and disposal of wastes. Roads and walkways on the premises should be constructed of all weather materials that reduce the transportation of organic materials on tires and shoes.

Design features should also include a one-way traffic system for all poultry facilities. One-way traffic routes personnel, vehicles, and poultry from youngest birds to oldest birds, from "clean" areas to "dirty" areas, and from individual poultry houses to common use employee areas. This prevents contaminants within the facilities from circulating into other stages of production.

Diseases in Poultry Facilities May Originate in One of Four Ways

1. They may be introduced by people including employees, servicemen, truck drivers, vaccination crews, veterinarians, etc.
2. They may be transferred via new poultry (chicks, pullets, breeding males, semen etc.).
3. They may arise from previously contaminated and improperly cleaned premises or equipment.

4. They may be introduced by vectors such as rodents, wild birds, insects, wind, or water.

Guidelines for developing a set of standard operating procedures for each of these potential disease sources will be covered in the following sections. These guidelines should be thoroughly understood and practiced by all poultry producers and affiliated personnel.

Preventing Disease Transmission by Human Traffic

Restrict access to poultry facilities. Keep out all unauthorized personnel and minimize the amount of time necessary outside personnel spend in or around the facilities. Control all vehicle traffic on the premises. If practical, keep a log and periodically review all vehicle, equipment, and personnel movement on and off the premises. This may allow correlation of disease problems to a possible source, and aid in correction of biosecurity failures. Necessary access vehicles should be cleaned and disinfected prior to entering a premise. Optimally, a non-attached building can be provided at the entrance of the premises for decontamination of all personnel and equipment accessing the facility. High pressure washing with a detergent product such as GENERAL CLEAN or DG-2003 and spraying of vehicle tires with a disinfectant solution such as D-600, DEAMY, IX-91 or MULTI-PHEN will decrease or eliminate most pathogens. Examples of necessary access vehicles include; feed and chick trucks, veterinarians, servicemen and government inspection officials. Traffic patterns for visitors should start with the youngest poultry first and progress according to age. Clean clothing and footwear should be provided for all personnel entering the facilities. In order to reduce the transmission of pathogens via personnel, employees should not own backyard flocks, pet birds, or exotic fowl.

Preventing Disease Transmission by Infected Poultry

Incoming poultry should come from disease free sources. NPIP approved farms are required to maintain records of poultry sold, and their final destination, for disease tracking purposes. When purchasing eggs or chicks, records should be inspected to verify that they are from disease free sources and have had appropriate vaccinations for the area. Such precautions are necessary to reduce the potential transmission of disease from one facility to another. Diseases of poultry can be spread from infected birds by egg transmission (transovarian) or from bird to bird. Transmission of pathogens through the egg includes transovarian transmission (hen to egg) and eggshell to embryo contamination during incubation and hatching. Post-hatch contamination of the chicks at the hatchery can also occur. Bird to bird transmission of disease may come from direct contact with an infected bird or through indirect contact with fomites such as feed, fecal material, or wind-borne pathogens.

Prevention of Disease Transmission by Contaminated Facilities

Effective cleaning and disinfection measures can substantially decrease disease transmission by

reducing the number of pathogens in the environment to non-infectious levels and greatly enhance a biosecurity program. An "all in-all out" policy will help prevent disease transmission from older birds to new birds by creating breaks when cleaning and disinfection can occur. Although "all in-all out" practices will maximize sanitation effectiveness, they are not always economically feasible. Therefore, poultry producers must customize plans for cleaning and disinfection that will reduce pathogens to minimum levels on their operations. In any case, facilities and equipment should be cleaned from top to bottom, inside to out and with the natural drain of effluent water, to prevent recontamination of cleaned facilities. Be sure that all equipment is adequately cleaned of organic matter (which reduces the effectiveness of disinfectants), then follow-up good cleaning procedures with an application of a disinfectant. There are many commercially available disinfectants labeled for poultry farm use on the market, such as D-600, DEAMY, MULTI-PHEN and IX-91. A detailed discussion is beyond the scope of this article. Follow product label recommendations and use only disinfectants approved by Agriculture Canada or Health Canada. Approved disinfectants have a P.C.P. number or D.I.N. number on their label.

Prevention of Disease Transmission by Vectors

In addition to the initial cleaning and sanitizing, disease prevention also requires the control of vectors. There are numerous vectors including; rodents, wild birds, insects internal and external parasites, which are capable of bringing pathogens to poultry facilities. Pathogens may be transferred via fomites such as fecal material (including wild birds, feces, feathers or dust). Pathogens can also be carried by wind, water, or in the feed. In order to increase the biosecurity level of the poultry facilities, an effective rodent and wild bird control program should be developed. Rodents consume and contaminate feed and spread numerous diseases. They may also destroy eggs, chicks, poults, equipment, and structures. Wild birds can be excluded from the premises by covering all vents and openings with a narrow mesh wire screen. Insects and parasites can be controlled with preventative programs and the proper use of insecticides such as SUPER FOG and medications. Efforts to minimize vectors such as these can significantly reduce the transmission of disease and the corresponding economic losses.

Biosecurity is a crucial component of good management practices. Poultry producers who develop and implement a biosecurity plan to control pathogens and their vectors will reduce economic losses caused by diseases. An effective biosecurity plan should be flexible in nature and open to new applicable technology as it develops, or becomes necessary. This paper is intended to provide the basis for developing a biosecurity system, and to emphasize the need for poultry producers to initiate their own efforts in designing a biosecurity plan for their individual facilities with support from provincial and federal extension agents.