

## Bio Security Measures in Poultry Farm

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### Introduction

The term "biosecurity" describes management strategies intended to prevent the spread of disease to people, animals, or a region from agents that cause the disease. "Security" denotes safety, while "bio" denotes life. The secret to improved chicken health and successful poultry production is biosecurity. To achieve this, the poultry shed must be kept in such a way that there is little to no movement of biological creatures (bacteria, viruses, rodents, etc.) within its boundaries. The most economical method of managing disease control is biosecurity, which is referred to as "informed common sense." Biosecurity is founded on two key principles: bio-exclusion, "preventing the introduction of a disease agent onto a farm" and bio-confinement, "preventing the spread of a disease agent onto a farm".

Poultry diseases and the associated costs are among the major constraints in the sustainable production of chicken (Byaruhanga *et al.*, 2017). The preventive measures otherwise known as biosecurity are more efficient and cost-effective in managing livestock and poultry health (Fasina *et al.*, 2012). Biosecurity is paramount in poultry farming to safeguard the health and well-being of both poultry flocks and the industry as a whole. Poultry farms are susceptible to various infectious diseases, and implementing robust biosecurity measures is crucial to prevent their introduction and spread. Strict control measures, such as restricted access zones, proper sanitation practices, and regular health monitoring, help mitigate the risk of disease transmission. Contaminants can enter farms through humans, equipment, or wildlife, emphasizing the need for comprehensive biosecurity protocols.

Good biosecurity is vital to the successful performance of any poultry production system (DAFF, 2009). Biosecurity protocols can apply to several sections of a poultry production system including: personnel and visitor requirements, restricting contact between poultry and other animals, proper shed sanitisation, equipment and vehicle disinfection, and thorough water treatment. Biosecurity protocols on poultry production systems aim firstly to reduce the potential

introduction of infectious diseases on the farm. If an infectious disease is introduced and becomes established, the protocols aim to limit spread of the disease within and between farms. Proper implementation of biosecurity protocols maintains good health and welfare of poultry on farms and reduces financial losses by decreasing the frequency and magnitude of infectious disease outbreaks (Fasina *et al.*, 2012).

Biosecurity has been highlighted as a key component in the prevention of many important infectious diseases affecting poultry, such as highly pathogenic avian influenza (HPAI) (Guinat *et al.*, 2020). Biosecurity is a key strategy to reduce the incidence of outbreak diseases, such as HPAI, by applying technical recommendations at the farm or poultry house (DAFF, 2011). Biosecurity measures are necessary to prevent the negative consequences of infectious diseases during chicken farming because they reduce the introduction, persistence, or dissemination of infectious agents (Loth *et al.*, 2011), and minimize the direct and indirect negative economic effect of infections on stakeholders (farmers, customers, and suppliers) (Can and Altug, 2014). Furthermore, biosecurity measures are vital for better performance and quality of chicken production in the competitive world.

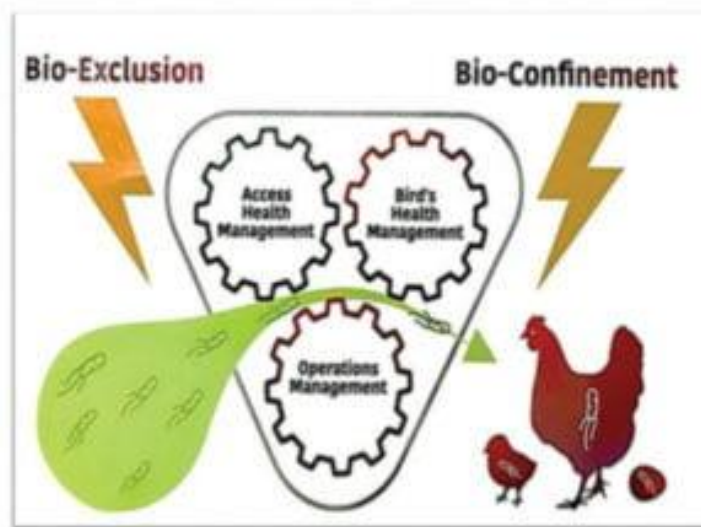


Figure 1: Principles of Biosecurity

### Major Routes of Disease Transmission

A significant consideration in biosecurity research is the spread of disease within a farm. According to several research, contaminated persons, poultry, farm equipment, and farm vehicles are the main ways that diseases spread from one farm to another. Examples of direct transmission include the spread of *Mycoplasma gallisepticum* through the ovaries, *Salmonella* spp. through eggshell penetration, *Escherichia coli* waterborne illness, and *Mycoplasma gallisepticum* through airborne transmission. However, the likelihood of airborne transfer is quite minimal. Another important aspect in the spread of the disease is the stability of poultry disease in the environment. The routes of disease transmission details are given in **Table-1**.

**Table1: Some examples of agents for disease transmission in a farm**

AGENTS	REASONS
Poultry	<ul style="list-style-type: none"> <li>· Transfer of birds from one production area to another production area</li> <li>· Disposal of dead birds</li> </ul>
Other animals	<ul style="list-style-type: none"> <li>· Wild and domestic birds</li> <li>· Feral, domestic animals and, livestock and pets</li> <li>· Insects</li> <li>· Rodents – rats / mice</li> </ul>
People	<ul style="list-style-type: none"> <li>· Farm personnel and family members living on site</li> <li>· Contractors, maintenance personnel, neighbors, serviceperson and visitors</li> <li>· Disease transmission through hands, boots, clothing and dirty hair</li> </ul>
Equipment	<ul style="list-style-type: none"> <li>· Previously used equipment</li> <li>· Other farm equipment's</li> </ul>
Vehicle	<ul style="list-style-type: none"> <li>· Through tires and vehicles loaded with equipment</li> </ul>
Air	<ul style="list-style-type: none"> <li>· Transmission as an aerosol or dust</li> </ul>
Water Supply	<ul style="list-style-type: none"> <li>· Water contaminated with feces from avian or other animal species</li> </ul>
Feed	<ul style="list-style-type: none"> <li>· Feed may be contaminated by the raw materials used, post-production and during transport, or by exposure to rodents and birds on the premises</li> <li>· Bacteria and mold in poor quality or contaminated feed</li> </ul>
Litter	<ul style="list-style-type: none"> <li>· Transport of litter material on and off the farm site as well as storage of used litter on site</li> </ul>

**Farm Standards for Complete Biosecurity**

Biosecurity measures depends upon the farm modality and standards (Figure-2). The farm standards redefine the easy steps for bio-security which is described as follows.

- The poultry production area must have well developed fence or boundary, defining biosecurity zone.
- If there is mixed farming or grazing area, there must be well defined grazing areas for other animals that must not be linked with poultry production system.
- Provision for separate clothes and boots for visitors.
- Footbath area should exist in farm entrance for individuals, vehicles and all other entries.
- Well-developed drainage system.
- Poultry house must be designed or maintained in such a way that minimal entry of wild birds and access to vermin is observed.
- Routine biosecurity procedures.

- Drinking water and cooling water supplied in poultry shed must meet poultry water standard.
- Only commercial poultry should be kept in production areas not other species.
- Better storage facility for feed.
- Separate weighing machine for the production areas.
- During rearing period, minimum 15-30 days gap for broiler flock, 1.5-2 months gap for layer flock and 1.5-2 months gap for breeder flock should be maintained.

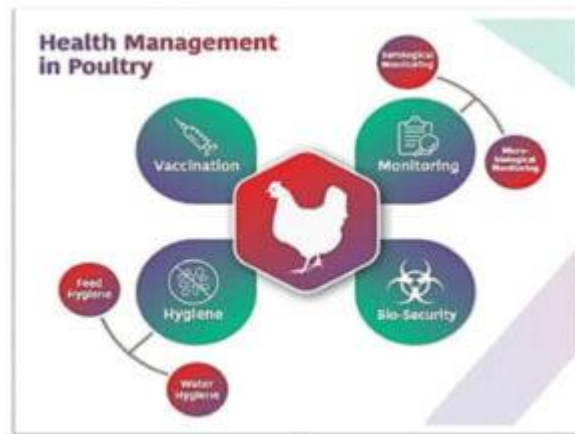


Figure-2: Health management in Poultry

### **Routine Biosecurity Procedure**

Routine biosecurity measures to maintain the poultry farm are discussed as follows.

- Farm workers should wear neat and clean clothes, and boots.
- Hand sanitizer should be used prior to house entry and upon exit.
- Farm workers should not entertain or contact with outside farm birds.
- Visitors on farms should be discouraged, especially contract persons like veterinarians and service providers. Visitor guidelines should be properly mentioned outside and inside the farm.
- Avoid allowing pets, wild birds and livestock inside the farm.
- Spraying disinfectants inside the farm should be done thrice a week; in diseased condition once or twice a day depending on the nature of disease.
- Spraying of disinfectant in vehicles of visitors should be strictly done.
- Treated water should be used if there is provision of surface water or during diseased condition.
- Before entry of chicks, farm should be properly disinfected and fumigated.
- Hatched eggs should be properly disinfected.
- Workrooms should be maintained clean.

- Sharing farm equipment's like poultry birds in cages should be avoided. Effective way of cleaning and disinfection of equipment must be taken care between farms.
- Routine maintenance of farm should be conducted whenever possible.
- Litter delivery and collection of used litter – trucks carrying new or previous litter must be cleaned and disinfected between production areas.
- Other delivery vehicles (e.g. gas, chicks, prepared flocks, eggs and feed) and drivers should not be allowed to enter in farms.

### Conclusion

Protecting chicken flocks and farms against dangerous pathogenic agents (microorganisms) is essential to the production of chickens since the introduction of pathogenic organisms can result in significant financial losses for farmers and poultry producers. Using biosecurity measures at every level of farming can help prevent disease outbreaks. The poultry sector can benefit from the application of biosecurity measures.

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