

WOLLO UNIVERSITY, SCHOOL OF VETERINARY MEDICINE

POULTRY DISEASE

CHAPTER ONE: INTRODUCTION TO POULTRY DISEASE

Learning objectives:

In this lecture the viewer will be able to

- know:
1. What is poultry?
 2. Why production poultry?
 3. What is the different b/n poultry and large animals?
 4. What is disease?
 5. What is the cause of disease?
 6. How the diseases are transmitted?
 7. How to prevent the disease?
 8. What to do if your birds look sick?

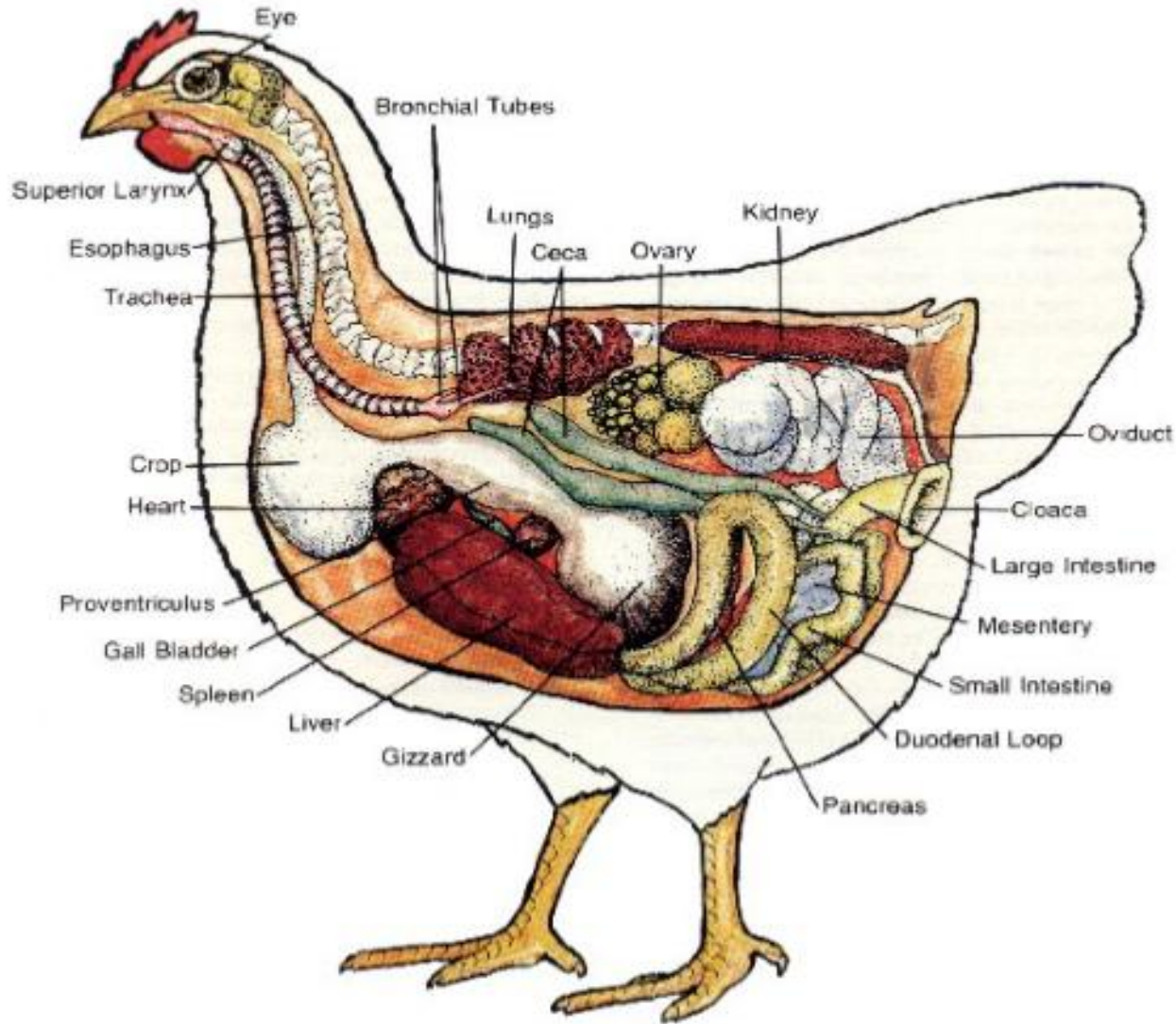
Anatomy and Physiology

- Lungs are attached to the body wall.
- Birds have no **diaphragm**
- **lack teeth**, most birds have a food storage organ called **crop**.
- **Urinary bladder** is absent.
- Birds have no **lymph nodes**
- **Seminal vesicle, prostate, bulbourethral** glands are absent.
- Ears lack external **pinna**

Chicken lung structure due to attachment of ribs



Anatomy of poultry



-)} The **word poultry** include all domestic birds kept for the **purpose of human food production**.
-)} These species comprise of **chickens**, turkeys, ducks, geese, pheasants, quail, squabs (young pigeons), Guinea fowl, partridges and ratites (ostrich).
-)} In Ethiopia, except **chickens**, all the others are found in their natural habitat
-)} **poultry is synonymous with chickens' under the present Ethiopian condition.**⁶

- ♣ Poultry are kept all over the world for various reasons.
- They are one of the cheapest sources of meat and egg and sometimes for feathers; skin and oil
- Poultry are raised primarily for meat and eggs but sometimes for feathers, skin and oil also such as ratites.
- Similar to other animals, birds are susceptible to a variety of diseases.


What is *disease*



♣ Any condition that results in deviation from normal function

♣ any departure from the normal state of health



- }\ Underfeeding
- }\ Overfeeding
- }\ Excess of heat, or cold
- }\ Lack of water
- }\ Annoyances **by lice, mites, worms** or other parasites, are all capable of disturbing the normal state of health  be considered as causing disease

CAUSES OF DISEASE

Infectious Agents

- Bacteria
- Viruses
- Parasites
- Fungi

Non-infectious agents

- Chemical
- Physical (***Environmental conditions***)
- Lack or excess of certain vitamins/minerals
- Management (Feed/H2O quality,

NOTE: Not all poultry health and production problems are caused by infectious agents. **LOOK AT MANAGEMENT FACTORS FIRST BEFORE CONSIDERING INFECTIOUS**

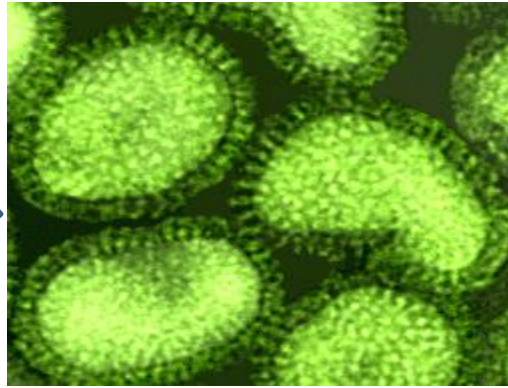
Sources of Pathogens

- ✚ Introduction of **diseased or carrier animals**
- ✚ Clothing or person of visitors
- ✚ Introduction of **contaminated materials** (fomites)-
feeds, forages
- ✚ Inappropriate disposal of carcasses
- ✚ Contaminated water supplies
- ✚ Fence line contact
- ✚ Vehicles
- ✚ Wildlife, rodents, wild birds, insects, pets
- ✚ Air-borne fomites

How do diseases occur?

- Diseases occur due to the interaction between 3 main factors:

AGENT



ENVIRONMENT



Host



Agent Factors

- Infectious Agents
 - Bacteria
 - Viruses
 - Parasites
 - Fungi
- Non-infectious agents
 - Chemical
 - Physical
 - lack or excess of certain vitamins and minerals
 - Toxins

Host Factors

- Breed
- Age
- Sex
- Immune status



Management & Environmental Factors

- Feed quality
- Lighting program
- Air quality and ventilation
- Water quality
- Space (floor or cage, feeder, dri
- Sanitation
- Vaccination and medication pro
- Weather
- Season
- Geographic location



Poultry Disease Diagnosis

It depends on **three important factors**

1. Identification of **vital organs and body structure.**
 2. Knowledge of disease **symptoms and lesions.**
 3. A **systematic plan** for examining the bird's body.
- To examining sick birds, familiar with the normal appearance of birds organs.
 - Examining a healthy bird can help you learn what to look for in sick birds.
 - Poultry diseases are as **diseases of the**

Effects of Poultry Disease (Economic importance of poultry disease)

- Decreased reproduction and productivity
- Increased mortality and decreased cash-flow
- Quarantines
- Market and Flock loss

Mechanisms of Disease Transmission

Transovarial Route

- Pathogens may be transmitted by the vertical route from **hen to progeny via**

- Mycoplasmosis
- Pullorum disease (*Salmonella pullorum*)
- Reoviruses and adenoviruses are transmitted in this way.

Transmission on the Egg Shell

- Pathogens can penetrate the shell and infect the developing embryo
 - **cloaca or nest-box litter can penetrate the shell** and infect the developing embryo.
 - *E. coli* and salmonellosis may be introduced¹⁸

Direct Transmission

- **susceptible flocks and clinically affected or asymptomatic reservoirs** (Contact).
 - This situation occurs in **multiage units** and is a common method of transmitting salmonellosis, coryza, mycoplasmosis, laryngotracheitis and pasteurellosis.

Indirect Transmission

- transport, equipment or feed onto farms or **movement of personnel** (without appropriate biosecurity measures).

Dissemination by Wind

- Infected flocks may excrete **large numbers of viruses** which can be moved by wind for distances of up to 5km (ILT)

Biological Vectors

- Rodents carry a **wide range of diseases** including pasteurellosis and salmonellosis
- Wild birds, ~~Rodents~~ →
- Spirochetosis → *Argas*
- Campylobacteriosis → House flies

Feed

- Contamination of **ingredients** or **manufactured feed with pathogens** such as *Salmonella* spp, or IBD and paramyxovirus virus can result in infection of susceptible flocks.

Vaccines

- **Contaminated** poultry vaccines prepared **in eggs derived** from non-specific pathogen free (SPF) flocks may contain pathogens including **adenoviruses, reoviruses.**
- Pathogens may also be transmitted among flocks as a result of contaminated

Prevention of poultry disease

- Depends on a comprehensive program incorporating a sequence of **planning, implementing and control**
- **Strategies to prevent infection are based on:**
 1. Purchase of breeding stock free of **vertically-transmitted disease**.
 2. Vaccination of parent flocks and progeny
 3. Appropriate levels of **biosecurity** represent the components of disease prevention subject to direct managemental control(Good Management such as **Brooding ,Air Quality and Nutrition/ Balanced**).



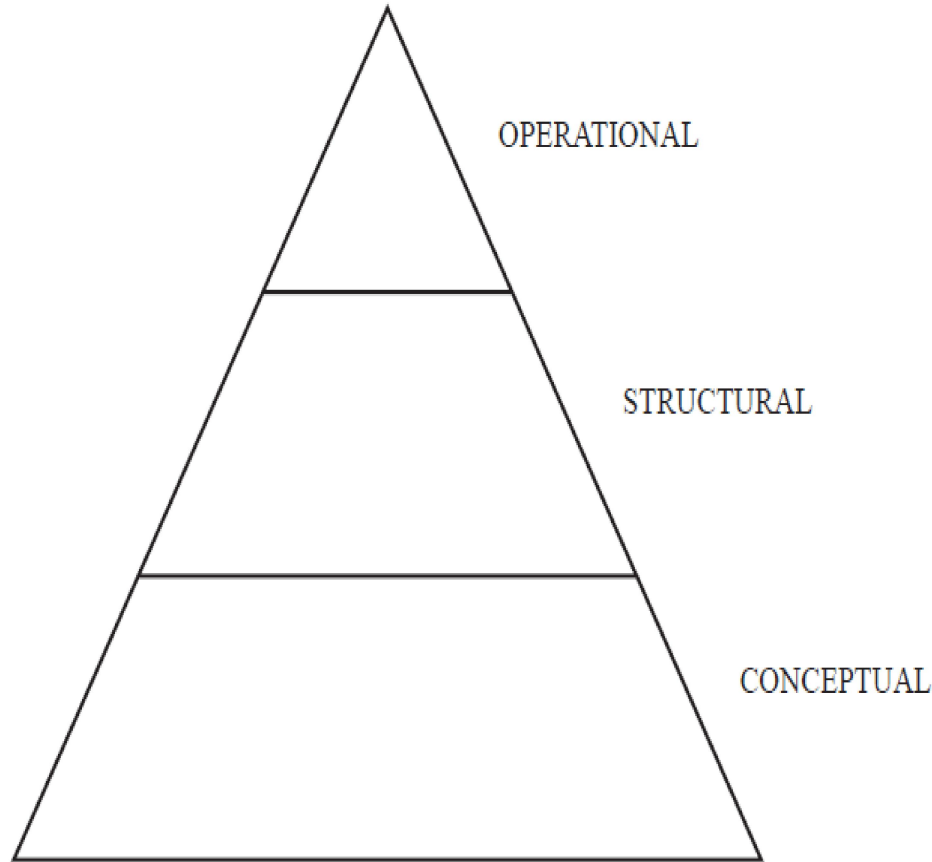
Biosecurity



**Greek: Bios - “Life”
Security - Protection**

⊙ Measures that are taken to prevent the transfer of diseases from place to place and animal to animal

components of biosecurity → **3 levels** influencing the cost and effectiveness of the entire program:



1. Conceptual Biosecurity: The **primary level** represents the basis of all programs to prevent disease.

Conceptual biosecurity includes:

- ⌘ Separate different types of poultry
- ⌘ Reduce biodensity (Monitoring of atmospheric ammonia at litter level. High ammonia level results in respiratory stress and blindness.
- ⌘ Avoid contact with free-living birds

2. Structural Biosecurity: The **second level** of biosecurity includes:

- Layout/plan/design of farms
- Construction of fences/ boundary marker
- construction of drainage (Pododermatitis (Bumble foot) resulting from wet litter)
- All weather roads
- Equipment for decontamination, bulk feed installations
- Exclusion of rodents and wild birds, and the interior finishes in houses.

3. Operational Biosecurity: comprises routine management procedures intended to prevent introduction and spread

- Good Management :***Brooding ,Air Quality and Nutrition/ Balanced***).
- ***Sanitation***
- ***Isolation***
- **appropriate monitoring of the health status and immunity of flocks contributes** to effective operational biosecurity.

Disinfection of Poultry Houses

- ⌘ Complete depopulation of houses and decontamination of units and surroundings at the end of each broiler, rearing, breeder or layer cycle
- ⌘ Houses should be sealed and fumigated with formalin (heated paraformaldehyde)
- ⌘ Equipment should be removed from the house for cleaning and disinfection.
- ⌘ The interior of the house should then be sprayed with a quaternary ammonium or phenolic disinfectant solution.
- ⌘ A 2% carbamate insecticide solution should be sprayed on the ceiling, walls, and floor (litter beetles)

- For many poultry diseases there is still no treatment.
- **Therefore Prevention is the only option!**

