

Republic of Iraq  
Ministry of Higher Education  
and Scientific Research  
University of Al-Qadisiyah  
Veterinary Medicine



Avian zoonotic diseases  
transmissible to humans

**A Graduation Project Submitted to the Department Council  
of poultry diseases- College of Veterinary Medicine/  
University of Al-Qadisiyah in a partial fulfillment of the  
requirements for the Degree of Bachelor of Science in  
Veterinary Medicine and Surgery**

by

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**1442 A.H**

**2021 A.D**

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

فَتَعَالَى اللَّهُ الْمَلِكُ الْحَقُّ ۖ وَلَا تَعْجَلْ بِالْقُرْآنِ مِنْ قَبْلِ أَنْ يُقْضَىٰ إِلَيْكَ

114 وَحَيْهٖ ۖ وَقُلْ رَبِّ زِدْنِي عِلْمًا (سورة طه اية

صدق الله العظيم

## Certificate of Supervisor

I certify that the project entitled (**Avian zoonotic diseases transmissible to humans**) was prepared by **Dhulfiqar ali mohsin** under my supervision at the College of Veterinary Medicine / University of Al-Qadisiyah.

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-- / -- / 2021

## Certificate of Department

We certify that **Dhulfiqar ali mohsin** has finished his/her Graduation Project entitled (**Avian zoonotic diseases transmissible to humans**) and candidate it for debating.

Instructor

Dr. Muthanna H. Hussain

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Dedication

To the owner of a fragrant biography and enlightened thought, for he had the first credit in attaining higher education (my beloved father), may God prolong his life.

To those who set me on the path of life, made me calm, and took care of me until I became old (my mother).

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## Abstract

Birds are one of the most interesting and most colourful groups of animals, but they can also be a source of zoonotic factors dangerous for humans. This paper describes the threats to human health from contact with birds. The most vulnerable occupational groups associated with birds are veterinarians, owners of poultry farms, breeders of ornamental birds, zoo personnel, and poultry slaughterhouse workers. Ornithosis is the most dangerous zoonosis of the avian bacterial diseases. Among other hazardous bacterial factors, Salmonella and Campylobacter are responsible for gastrointestinal diseases. Avian influenza is the most dangerous of the viral diseases. It should be noted, however, that avian influenza is a disease of birds, not humans.

## INTRODUCTION

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When handling birds, whether poultry or wild birds, it is important to remember that there are several avian diseases which can also make humans sick. The term 'zoonoses' refers to diseases that can be passed from non-human animals to humans.

### **Avian influenza**

refers to the disease caused by infection with **avian (bird) influenza (flu)** Type A viruses. These viruses occur naturally among wild aquatic birds worldwide and can infect domestic poultry and other **bird** and animal species. **Avian flu** viruses do not normally infect humans.

Humans can be infected with avian, swine and other zoonotic **influenza viruses**, such as avian influenza virus subtypes A(H5N1), A(H7N9), and A(H9N2) and swine influenza virus subtypes A(H1N1), A(H1N2) and A(H3N2)

### **Clinical signs in human**



**Fig.1:** Bilaterally subconjunctival hemorrhage in a patient with pandemic H1N1.

(iscimen,R. kelebek,N. baykara,M. 2013. Casereports)

disease ranging from mild upper respiratory tract infection (fever and cough), to severe pneumonia, acute respiratory distress syndrome (breathing difficulties), shock and even death. Conjunctivitis (“pink eye”), gastrointestinal symptoms, encephalitis (inflammation of the brain) and encephalopathy (brain damage or disease) have also been reported to varying degrees depending on subtype.

### Clinical signs in birds



Symptoms in birds differ according to the species but can include diarrhoea, breathing difficulties, swollen head and death. A sick bird sheds the virus in its feathers, mucous, saliva and faeces. ( USDA Nov 22, 2016)



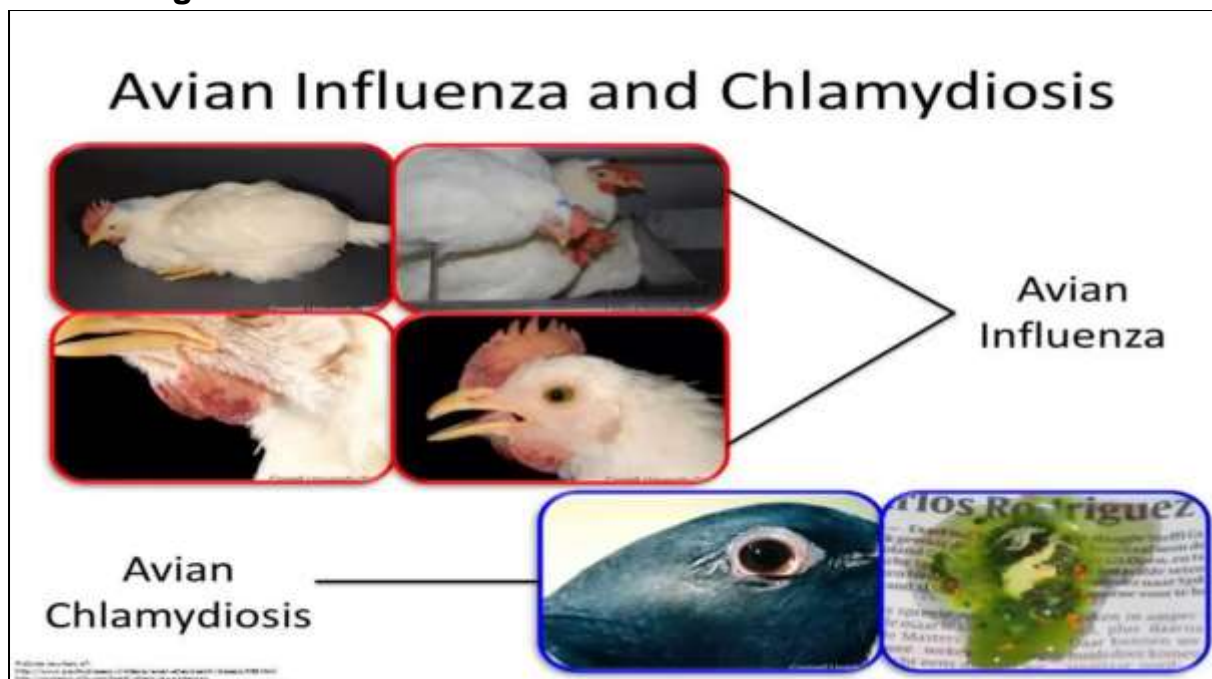
## Vaccine

The vaccine, called NDV-H5Nx, protects chickens and likely other poultry against the three recently introduced U.S. avian influenza strains H5N1, H5N2 and H5N8, as well as against Newcastle disease virus -- a virus that naturally affects poultry.

## chlamydiosis in birds

Avian chlamydiosis (AC) is a disease of birds caused by the bacteria *Chlamydia psittaci*. AC is common in wild, caged and aviary birds. All birds can be infected by AC, but pet birds, especially parrots (e.g. budgies, lorikeets and cockatiels) most commonly pass infection to humans.

## Clinical signs in birds



(virginia department, 2015, vdh virginia )

- mucous or pus coming from the nostrils and eyes.

- cough.
- diarrhoea or dark green droppings.
- poor feeding.
- difficulty moving or flying.
- death, which can sometimes be sudden with no warning signs.

### **Symptoms of psittacosis in humans**

- Fever.
- Headache.
- General malaise.
- Muscle aches.
- A dry cough.
- Shortness of breath

### **Treatment**

Tetracyclines (chlortetracycline, oxytetracycline, doxycycline) are the antibiotics of choice.

### **Salmonellosis in birds**

Disease caused by one of the two poultry-adapted strains of *Salmonella* bacteria, *Salmonella Gallinarum*. This can cause mortality in birds of any age. ... Chickens are most commonly affected but it also infects turkeys, game birds, guinea fowls, sparrows, parrots, canaries and bullfinches.

### **Clinical signs in birds :**

Depression, poor growth, weakness, diarrhoea and dehydration are symptoms of the disease. Lesions may include an enlarged liver with necrosis, unabsorbed yolk sac and enteritis with necrotic lesions in the mucosa. Sometimes there may be no lesions due to acute death caused by septicaemia.

# *Salmonella gallinarum*



(monleon,R.philippines 29th march. (2014)

# ***Salmonella pullorum***



(monleon,R.philippines 29th march. (2014)

## **Post mortem lesions**

- 1. Dehydration**
- 2. Enteritis**
- 3. Focal necrotic intestinal lesions**
- 4. Foci in liver**
- 5. Unabsorbed yolk**
- 6. Cheesy cores in caecae**
- 7. Pericarditis**
- 8. Perihepatitis**
- 9. Misshapen ovules in the ovaries**

***Salmonella* vaccination programs can consist of either inactivated, modified-live vaccines or a combination, depending**

on the flock's needs. Poulvac ST, Poulvac SE-ND-IB and Poulvac SE for a sound management program.

#### **Inactivated vaccination only:**

- Best suited for SE-positive layer complexes
- Complements other control measures on high-risk layer farms
- Bacterins can be given at same time as other inactivated vaccines

#### **Modified-live vaccination only:**

- Suitable for SE-negative pullet and layer farms
- Complements other control measures on low-risk farms
- Follows the 3-3-3 Rule of Thumb: vaccinate at 3 Days, 3 Weeks and 3 Months

#### **Inactivated and modified-live vaccination:**

- Can offer the most complete program
- Appropriate for maximum risk reduction
- Helps provide earlier protection for pullets
- Modified-live vaccines can help enhance bacterin response

### **Colibacillosis in birds**

Colibacillosis is a localized or systemic infection caused by avian pathogenic *Escherichia coli* (APEC). It manifests in diverse ways, including as acute fatal septicemia, subacute pericarditis, airsacculitis, salpingitis, peritonitis, and cellulitis.

#### **clinical manifestations :**

- Respiratory signs, coughing, sneezing.
- Snick.
- Dejection.
- Reduced appetite.

- **Poor growth.**
- **Omphalitis.**



( Azza A. El-sawah , December (2018), science direct )

## Post-mortem lesions

- **Airsacculitis.**
- **Pericarditis.**
- **Perihepatitis.**
- **Swollen liver and spleen.**
- **Peritonitis.**
- **Salpingitis.**
- **Omphalitis.**
- **Synovitis.**
- **Arthritis.**
- **Enteritis.**
- **Granulomata in liver and spleen.**
- **Cellulitis over the abdomen or in the leg.**

- Lesions vary from acute to chronic in the various forms of the disease.

### Conditions seen due to APEC infection in poultry



Salpingitis in laying hens (39).



EGG YOLK PERITONITIS (40)



Colibacillosis in chicks and adult

( chalkiwar,A. Engormix. (2019) )



- 1: congestion of internal organs
- 2: congested liver compared with normal one.
- 3: two ceca filled with yellowish to greenish or brownish contents with gases.

( Azza A. El-sawah , December (2018), science direct )

## Treatment

**Amoxycillin, tetracyclines, neomycin (intestinal activity only), gentamycin or ceftiofur (where hatchery borne), potentiated sulphamide, flouroquinolones.**

## Avian tuberculosis (avian TB)

**is a chronic wasting disease caused by infection with *Mycobacterium avium* that can affect a wide range of bird species and may infect a number of mammalian species.**

## Clinical signs of tuberculosis in birds

**Birds of all ages may be affected but usually the disease occurs after 3 weeks:**

- **Gradual wasting especially evident as atrophy of the pectoral muscles**
- **Tiredness**
- **Dull and ruffled plumage**
- **Jaundice (if liver is involved)**
- **Lameness or dropping of wing (with bone or joint lesions)**
- **Diarrhoea**



## Post-mortem findings

- **Characteristic greyish-white or greyish-yellow nodules of varying size are almost invariably present in spleen, liver and intestines. Almost any tissue may be affected.**
- **Affected livers and spleens are enlarged and may eventually rupture**
- **Involvement of the lungs is less common**



( Dinev,I. The poultry site .( 2000)

**Treatment: there is no treatment and vaccine**

**Newcastle disease**

Newcastle disease is an infection of domestic poultry and other bird species caused by avian paramyxovirus serotype type 1 (APMV-1) also called virulent Newcastle disease virus (NDV). It is a worldwide problem that presents primarily as an acute respiratory disease, but depression, nervous manifestations, or diarrhea may be the predominant clinical form.

The main signs are:

- sneezing.
- nasal discharge.
- coughing.
- greenish, watery diarrhoea.
- depression.
- muscular tremors.
- drooping wings.
- complete paralysis.



( Nashiruddullah,N. Researchgate . oct (2020)

Clinical signs in human

# Newcastle Disease in Humans



Addition by  
DVM - Abdol majid kosari nejad  
Province Boushehr veterinary management  
Jan 2011

(majid,A . slideplayer. Jan (2011))

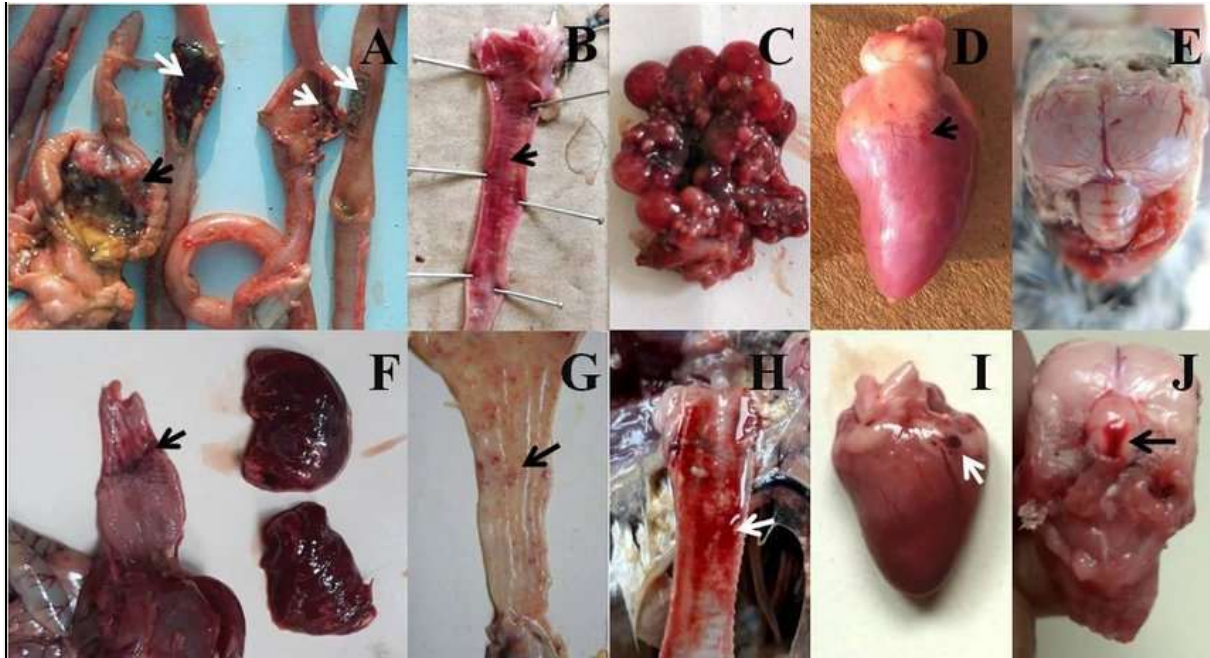
## Post mortem lesions

in the viscerotropic velogenic form:

- Oedema of the interstitial tissues of the neck
- Haemorrhages and necrosis in the proventriculus, gizzard and small intestinal wall. Small haemorrhages are often present in other internal organs.

the neurotropic velogenic and mesogenic forms:

- Acute laryngitis and tracheitis congestion and catarrhal exudates air sacs thickened and cloudy
- Sometimes haemorrhages in the proventriculus, but rarely elsewhere



( Nashiruddullah,N. Researchgate . oct (2020)

### Vaccines

A wide range of live and inactivated vaccines are used in vaccination programs to prevent ND.

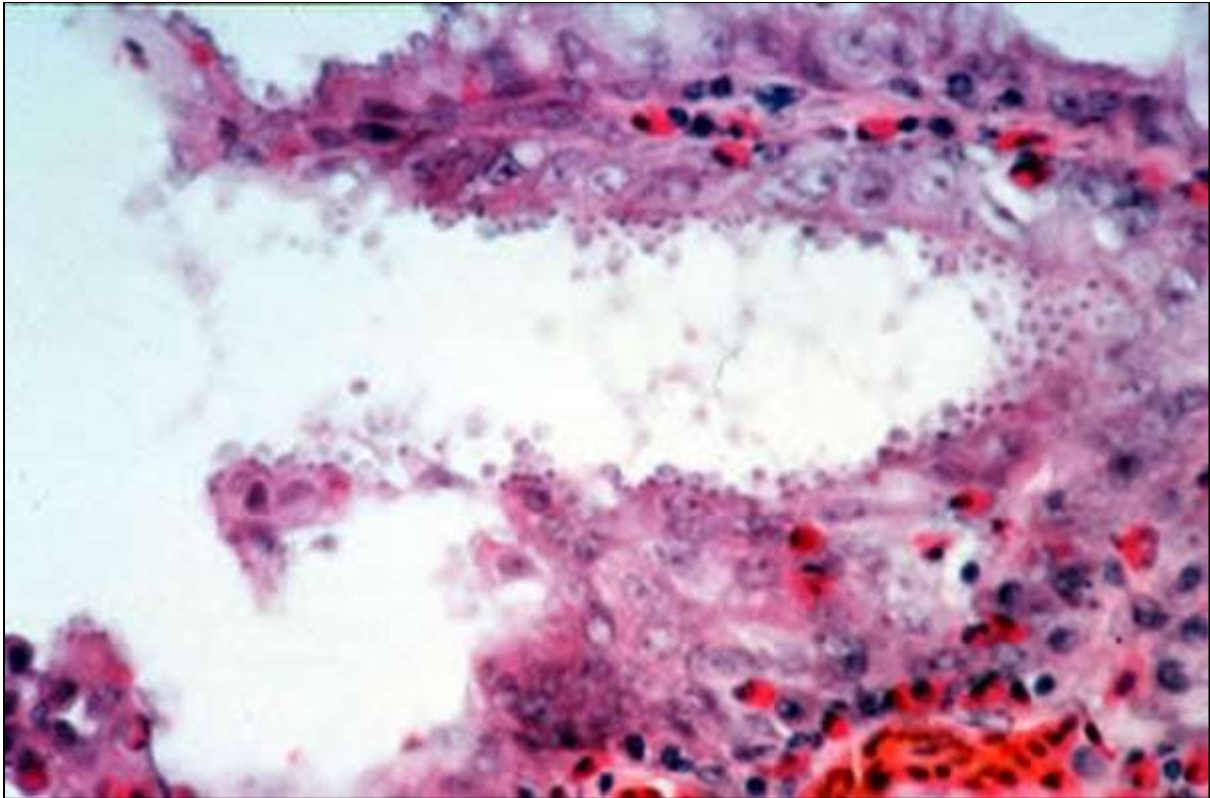
“The new generation” of live recombinant HVT-vector vaccines give the opportunity for early hatchery vaccination and can be used to replace conventional ND vaccination, eliminating vaccination reactions and inducing life long protection.

### Cryptosporidiosis in poultry

Cryptosporidiosis is one of the main protozoan infections in birds. It manifests as either a respiratory or a digestive illness, and it affects a very large number of avian species across several continents. ... Protozoa of the genus *Cryptosporidium* parasitize fish, amphibians, reptiles, birds and mammals.

### Clinical manifestations

In turkeys and chickens, *Cryptosporidium* have been found in the sinuses, trachea, bronchi, cloaca, and bursa. The most common clinical signs include diarrhea and dehydration. In addition to diarrhea, the parasites can infect the respiratory tract and lead to coughing, gasping, airsacculitis, and sometimes death. Lungs become gray and wet. Signs may last several weeks.



( sander.J. msdvetmanual. Aug (2019)

## Post-mortem lesions

- Sinusitis.
- Airsacculitis.
- Pneumonia

## Treatment

Unfortunately there is currently no known effective treatment in poultry.

### avian campylobacteriosis

Infection of the intestinal tract with *Campylobacter jejuni* and other *Campylobacter* spp is common in poultry and waterfowl, but most species do not cause clinical disease. Poultry are a common source of human infection.

### Clinical signs

Most chickens are carriers of the bacteria without clinical symptoms. The importance is just for human health from consumption of inadequately cooked chicken meat containing the bacteria. There is a 24-72 hour incubation period. Depression, soiled vent, and diarrhoea can be seen.

### Postmortem lesions

Distension (enlargement) of the intestinal tract, accumulation of mucus, watery fluid and haemorrhages in intestines can be seen. Focal hepatic necrosis may also be present.

### Clinical signs in human

The most common clinical symptoms of *Campylobacter* infections include diarrhoea (frequently bloody), abdominal pain, fever, headache, nausea, and/or vomiting. The symptoms typically last 3 to 6 days.

**Treatment** Many antibiotics are effective.

## **Control and prevention**

### **PROPER PERSONAL HYGIENE**

- 1. Wash hands before and after bird handling.**
- 2. Do not eat or drink in the birds housing areas.**
- 3. Wear coveralls, farm specific clothing or laboratory coats when handling chickens.**
- 4. Avoid handling sick birds or animals with lesions unless gloved.**
- 5. Wear a mask if you are allergic to animal hair or dander or if feed or bedding dust is present.**
- 6. If you are sick, DO NOT enter the agricultural animal facilities. You are more susceptible to other infective agents and you may transfer pathogens to the animals!**
- 7. Routinely wear gloves when cleaning animal area.**
- 8. Note progression of any illness. Report illnesses to your supervisor.**
- 9. Inform physician of your animal related activities.**

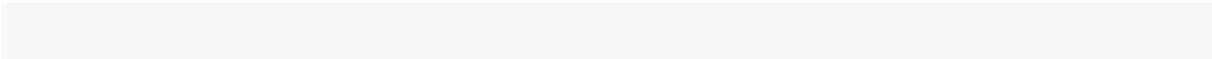


## **ENVIRONMENTAL MAINTENANCE**

- 1. Keep poultry housing areas well organized and clean.**
  - 1. Avoid urine and fecal build-up. Dry feces result in fecal dust which may be inhaled.**
  - 2. Clean rooms have a lower likelihood of horizontal or zoonotic transfer.**
  - 3. Proper ventilation protects the birds and workers.**
  - 4. Clean feed and bedding from floors. Litter attracts vermin which may introduce a zoonotic disease into the facility.**

## **HERD/FLOCK MAINTENANCE**

- 1. Observe birds for health status on a daily basis.**
- 2. Report sick or dead birds.**
  - 1. Note health problems such as diarrhea, difficulty breathing, depressed, immobile.**

- 2. Take extra caution in cleaning the areas around ill chickens. Don't spread possible pathogens.**
  - 3. Isolate affected birds as appropriate.**
  - 4. Record history or progression of animal disease.**
- 

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- tracheal mucosa in turkey by dr. jean sander Oklahoma State University - Stillwater |  
Oklahoma State · Department of Veterinary Pathobiology  
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