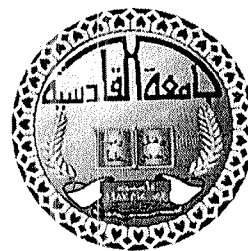


Republic of Iraq  
Ministry of higher Education &  
scientific Research  
University of Al-Qadissiya  
College of Veterinary medicine



# **Infectious bronchitis in poultry**

**A Research**

**Submitted to the council of the college of Veterinary Medicine /  
University of Al-Qadissiya in partial fulfillment of the  
requirements for the Degree of Bachelor of Science in  
Veterinary Medicine**

**By**

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2016 A.D.

1437 A.H.

## Supervisor's Certificate


Testify that **Hajar Fadhil Abed Al-zahraa** had completed her graduation  
Search for the year under our control.

### *Signature*



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## Supervisor's Certificate

Testify that **Hajar Fadhil Abed Al-zahraa** had completed her graduation

Search for the year under our control.

  
*Signature*

Asst.pro.Dr.  
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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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## **Dedication**

*To, my God and my nation to the Messenger Muhammad (God bless him and God and peace), my family and my friends and my professors and all those who supported me in completing my graduation Search ,Thank you from the bottom of my heart for all the support and assistance and to pray. I wish you achieve the satisfaction of God and achieve Wish list.*

**Hajar**

## SUMMARY

**IB** acute, highly contagious viral respiratory disease of chickens characterized by tracheal ralse, coughing, and sneezing. Its of major economic importance because IB is a cause of poor weight gain and feed efficiency, a component of mixed infections that produce airsacculitis which may result in condemnations broilers processing, and a cause of egg-production and egg-quality declines. The highly transmissible nature of the disease and the occurrence of multiple serotypes of IB virus (IBV) have complicated and increased the cost of attempts to prevent the disease by immunization. (IB) appears to have no public health significance. Losses from production inefficiencies are usually of greater concern than losses from mortality, although the latter are economically significant in broilers. Mortality in broiler often peak in the last two weeks of life, commonly at five to six week of age. Some strain of the virus is highly nephropathogenic, with the potential to cause mortality up to 30% in young birds. The virus replicates in the oviduct IB in mature birds can result in decreases of 10 to 50% or more of production, plus increased numbers of deformed eggs or altered egg shell coloration.

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# Chapter one

# **Introduction**



## **(1-1) Introduction**

It's acute, highly contagious viral respiratory disease of chickens characterized by tracheal ralse, coughing and sneezing .The disease may affected kidney, and in laying flocks there is usually a drop in egg production and egg quality. Mortality may occur in young chick due to respiratory or kidney manifestation of infection (1).

The respiratory infection is usually mild and self limiting in chicken. The economic importance of the disease is often complicated by infection bronchitis virus (IBV) strains that cause kidney and oviduct damage as well as by secondary bacterial infection (2).

Both live and inactivated virus vaccines are used for immunization against IB. Live vaccine are used in broilers and for initial vaccination of breeders and layers. Although live vaccines are generally inexpensive, easy to time. The killed vaccines are more expensive but confer good protection, which are maintained over a long time (3).

Thus for all mentioned data the aims of this study can be summarized as the followings:

- I. Determination of the best vaccination program for IBV to provide better immune response against IB infection.
- II. Pathological change in the certain internal organ like bursa of fibrosis and thymus, kidney and trachea.
- III. Estimation the interaction and /or interference of both IBV vaccines strain (IBV 120 and 4/91 on vaccination with ND strain).

Chapter two

**Review of  
literature**

## **(2-1) Review of literature**

**Infectious bronchitis (IB):** is an acute and high contagious viral disease which occurs worldwide and results in severe economic losses in the poultry industry. In young chicks, it's cause reduced disease or nephritis leads to mortality, reduced weight gain and condemnation at processing exclusion, whereas in laying age chickens, the disease is subclinical and results in reduced egg production and anomalous eggs.(4)

**Etiology (IBV):** is a member of genus corona virus, family coronaviridae, in the order Nidovirales. IBV and other avian corona viruses of turkeys and pheasants are classified as group 3 coronaviruses, while, mammalian coronaviruses comprising group 1, 2, and 4 but, group 4 being the more recently identified sever acute respiratory syndrome.(5)

The causative agent of IB is corona virus, it's round to pleomorphic in shape, and possesses and envelope that is approximately (120) nm in diameter with club-shaped surface projection (spikes) about (20) nm in length. (6)

### **(2-2) Morphology and structure of virus:**

Several IB viruses specific proteins have been identified, out of which three are most important, the spike (S) glycoprotein, the membrane (M) glycoprotein, and the nucleocapsid(N) protein.(7)

Coronaviruses are enveloped viruses with a positive-strand RNA genome (27\_32kb). Coronaviruses have the largest RNA virus genomes and replicate by means of the specific enveloped transcription. Moreover, its mismatching percent

and the combination percent is very high, so the virus can mutate easily, Thus the viruses" antigenicity and pathogenicity are changed by these factors.(8)

### **(2-3) Infectious bronchitis in Iraq:**

Infectious bronchitis disease is one of the disease that reported in flocks of layers and broilers in many governorates if Iraq.(9)

(8) was the first could isolate IB virus in Iraq, then (9) could isolate the IBV from suspected causes of broiler chicken in Mosul. New publication referred to recorded the disease in sulaimaneyah, where (10) referred to many out breaks of IB appeared in Baghdad and in other governorates that diagnosis with indirect ELISA technique, also he interoperated that due to vaccination with unsuitable strain of IB, Finally (11) found that attenuated live vaccines may regain their virulence and the risk is even greater with viruses that have high frequencies of mutation.

### **(2-4) Transmission:**

IB spread rapidly among chicken in a flock, it is highly contagious and has a very short incubation period, susceptible bird placed with infected chickens usually developed clinical signs within 24-48 hours, through, direct contact between susceptible bird and infected chickens or through contamination of food and water with excretion of respiratory and alimentary system of infected chickens. The transmission from farm to farm is, principally, by movement of birds, contaminated equipments, people and vehicles.(12)

## **(2-5) Clinical signs:**

The nonspecific respiratory signs of IB in susceptible chicks are gasping, sneezing, tracheal rattle, and nasal discharge. Watery eyes may be observed, and occasional chicks appear depressed and may be seen huddled under a heat source.

Feed consumption and weight gain are significantly reduced. The diseases cause a high mortality rate in young chickens when it's complicated with secondary bacterial infection such as *E. coli* and *Mycoplasma*. (13)

Broiler chickens infected with a nephrotoxic virus may appear to recover from the respiratory phase and then show signs of depression, ruffled feathers, wet droppings, increased water intake, and mortality. (14)

In laying flocks, decline in egg production and quality are seen in addition to respiratory signs. Respiratory signs can be absent or very mild, in case of clear production drops and the production of eggs with pale, unpigmented shells. The severity of production decline depended on factors such as the causative virus strain and level of immunity against that strain, and the timing of infection. (15)

## **(2-6) Immunity**

### **I. Passive immunity**

Maternal derived antibodies (MDA's) are an effective barrier against infections within the first two to three weeks of life. This is beneficial if virulent infections with field strains occur. MDA produced by vaccination of breeders can provide protection of their chicks against IBV challenge until one week of age, but many do not prevent viral infection of the respiratory system.

Studies of the antibody pattern show that it is common with field infections breaking through the vaccine protection. (16)

## **II. Active immunity**

The chickens that infected by IBV need more than weeks to reach to the high levels of antibodies.

referred that the antibodies against IBV in adult layer need four weeks to reach the high levels after infection by Arkansas strain.

Both breed and strain related genetic resistance to IBV infection , chickens just recovered from natural disease are resistance to challenge with same virus ( homologous protection ) but the extent of protection to challenge with other IBV strain (heterologous protection) varies.(17)

### **(2-7) Immunization:**

There are two types of IB vaccines, live attenuated and inactivated IB vaccine .

#### **1. Live vaccines:**

Live vaccines are usually applied to broiler chickens at one day of age , in the hatchery , this can result in sterile immunity when challenged by virulent homologous virus within three week of vaccination , the function of live – vaccine stimulate humeral and cell-mediated immunity against IBV.

The live vaccine can be given by different methods including eye drop, spray, and drinking water. The efficacy of vaccination with live vaccine varies amongst inbred lines of chicken like genetic differences between individuals affects on the efficacy of immune response.(18)

#### **2. Inactivated vaccine :**

Inactivated oil emulsion IBV vaccines were developed during the 1960-1970.

Inactivated IB vaccines, when used for booster vaccination, are beneficial for the egg laying performance of breeder and layer hens. Inactivated IB vaccine is effective only when used as boosters in flocks following primary vaccination with live\_attenuated IB vaccines. This type of vaccines act to induce the neutralized antibodies against IBV in the sera of chicken and resist challenge. These type of vaccine prepared by treatment different chemicals like beta\_propiolacton. One of the main advantages of using inactivated vaccine is the inability to induce the disease or appear or appearance of side effects, because they do not replicate in the bird and they do not diffuse among the non\_vaccinated birds.(19)

### **(2-9) Diagnosis**

Diagnosis of IBV is accomplished by isolating and serotype the causative field isolate. The virus-neutralization (VN) and Haemagglutination-inhibition (HI) tests have been until the only procedures for stereotyping.

The polymerase chain reaction (PCR) is use successfully to diagnose IBV, The ELISA is a rapid, sensitive, and specific serologic test that use for detection of IBV antibodies in chickens.(20)

### **(2-10) Differential Diagnosis**

Infectious bronchitis may resemble other acute respiratory diseases such as Newcastle disease (ND), infectious laryngotracheitis, low pathogenicity avian influenza, Newcastle disease caused by velogenic viscerotropic or neurotropic strains of paramyxovirus type 1 produces much higher mortality than IB.

Lentogenic ND infections with pneumotropic strains and low pathogenicity strains of avian influenza produce mild to moderate respiratory disease with low mortality. Thus, may resemble IB.(21)

### **(2-11) Vaccination Programs:**

Different strains of IBV have been used as vaccines. The Massachusetts serotypes are used widely around the world because initial isolates from many countries were of serotype.

The use of Ma5 vaccine (Massachusetts serotype) at 1 day old and the heterologous 4/91 vaccine at 2 weeks of age, was shown to be highly effective in protecting the respiratory tract of specific pathogen-free chickens from many serotypes, isolated from disease outbreaks in different parts of the world.

Reported that the live New Zealand strain A virus (49th egg passage), protected layers from IBV infection on farms with good management techniques but vaccination on another commercial farm gave less than ideal protection, due to intercurrent disease.

The ability of different vaccine programmes (including the 4/91 vaccine strain) to protect against field infectious bronchitis virus (IBV) strain Italy 02 was investigated using specific pathogen free (SPF) chickens, protection, as measured by assessing ciliary activity of tracheal epithelium following challenge, was excellent with all vaccine schedule used in this trial.(22)



### **(2-13) Treatment**

No specific treatment exists for IB. provision of additional heat to eliminate cold stress, good air quality, elimination of overcrowding, and attempts to maintain feed consumption to prevent weight loss are flock management factors that may help to reduce the losses from IB.

Treatment with appropriate antibacterial may be used to aid in reducing the losses from airsacculitis resulting from infection by secondary bacterial pathogens. IBV can be controlled primarily by the mass application of modified live vaccines and used routinely in many prone areas to control the disease and minimize its effect.(23)

Chapter three

**Conclusions &  
recommendati  
ons**

### **(3-3) Conclusion:**

The IB virus highly epidemic in Iraq depending upon clinical cases diagnosed in Vet. hospital isolate the virus causing the disease nationally and internationally where the company coordinate with laboratories, and in Iraq there was isolation of Influenza virus of bird with low virulence as the diseased flocks are previously vaccinated, it may indicate that there is no matching between field isolate and vaccine strain.

### **(3-3) Recommendation**

- I. Intensive biosecurity in the poultry farms.
- II. Healthy managements of chicken houses to prevent viral spreading, highly morbidity, and controlling difficulties.
- III. uses the vaccines at the perfect time with the correct doses, the some source in the country and insure the vaccines sources and their activity.
- IV. More studies are needed to find a correlation between the local IB viruses strain and the vaccine IBV strain.