



PARTNERS **IN**
PROGRESS

Respiratory viral affections in broilers: Differential diagnosis and control.

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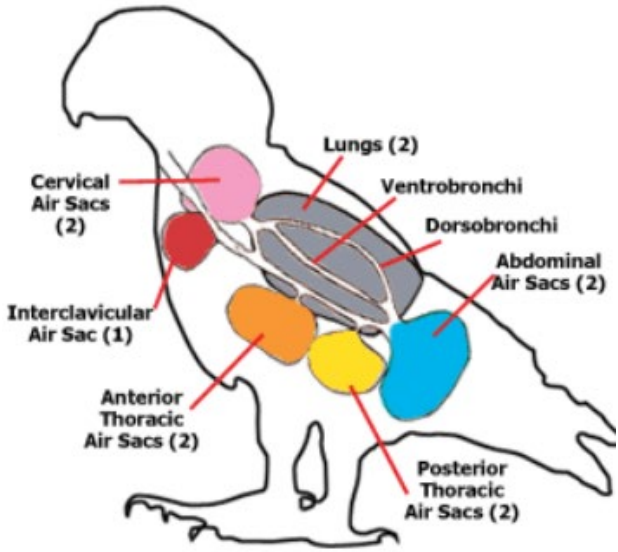
Prof. of poultry Diseases

Former Dean of Fac. of Vet. Medicine

Beni-Suef University.

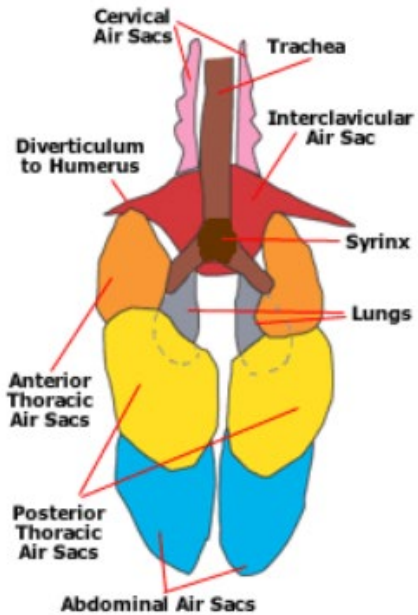
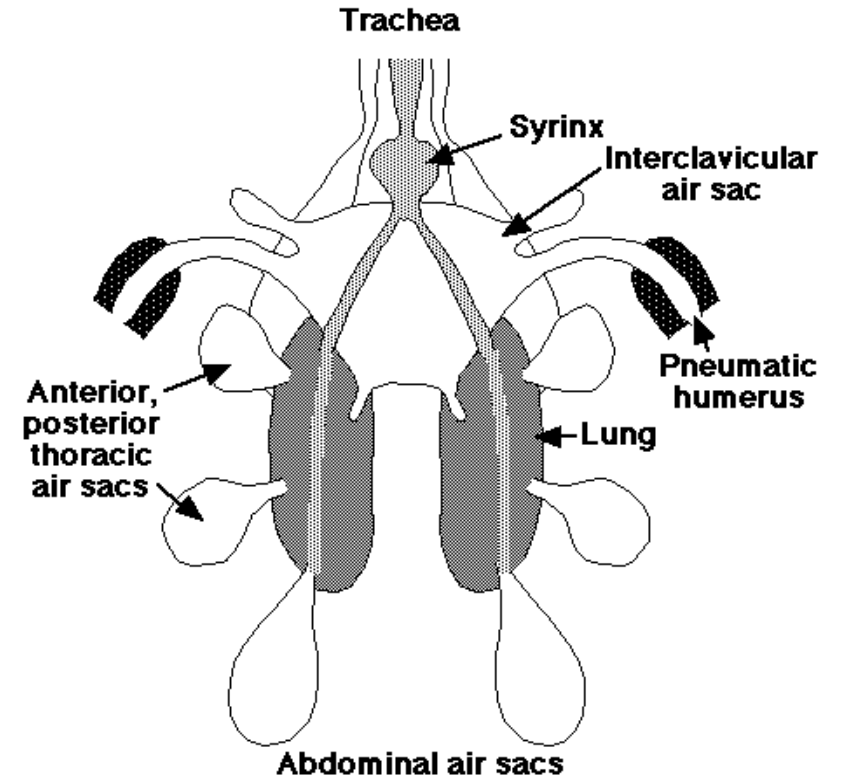
President of EVPA

INTRODUCTION: Respiratory system

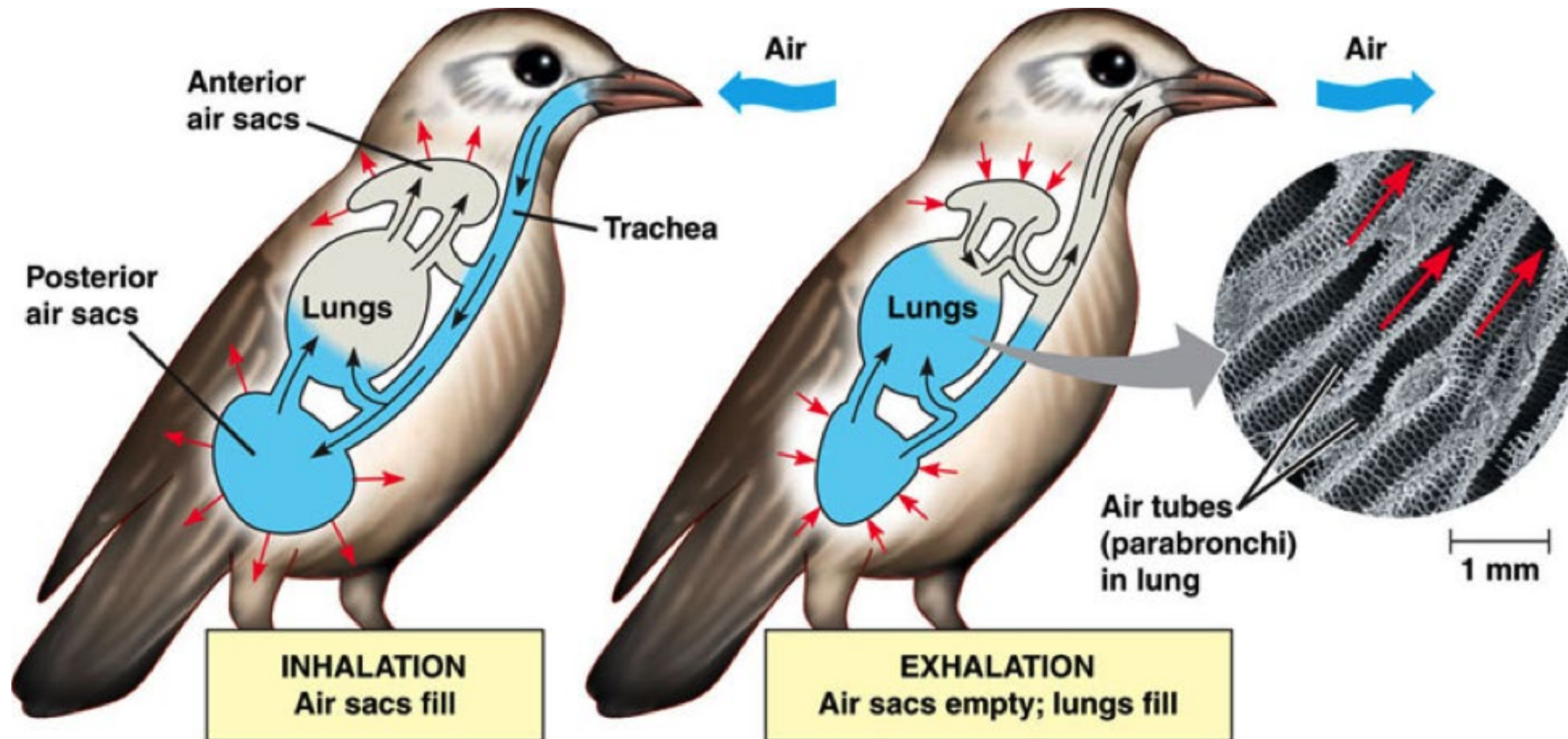


- Trachea
- Syrinx
- Bronchi
- Lungs
- Air sacs:

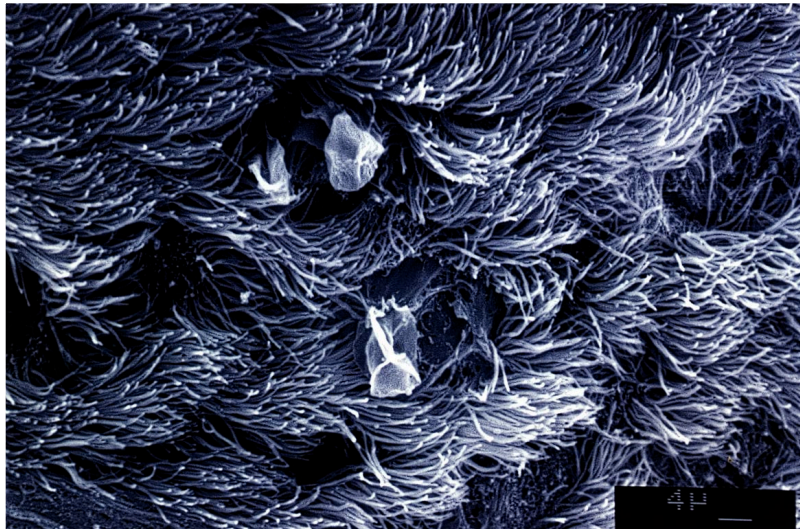
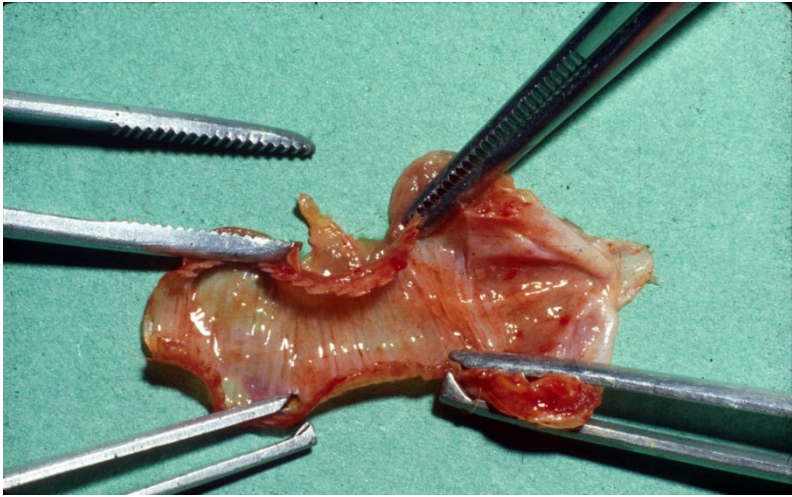
- Interclavicular
- Cervical
- Anterior thoracic
- Posterior thoracic
- Abdominal



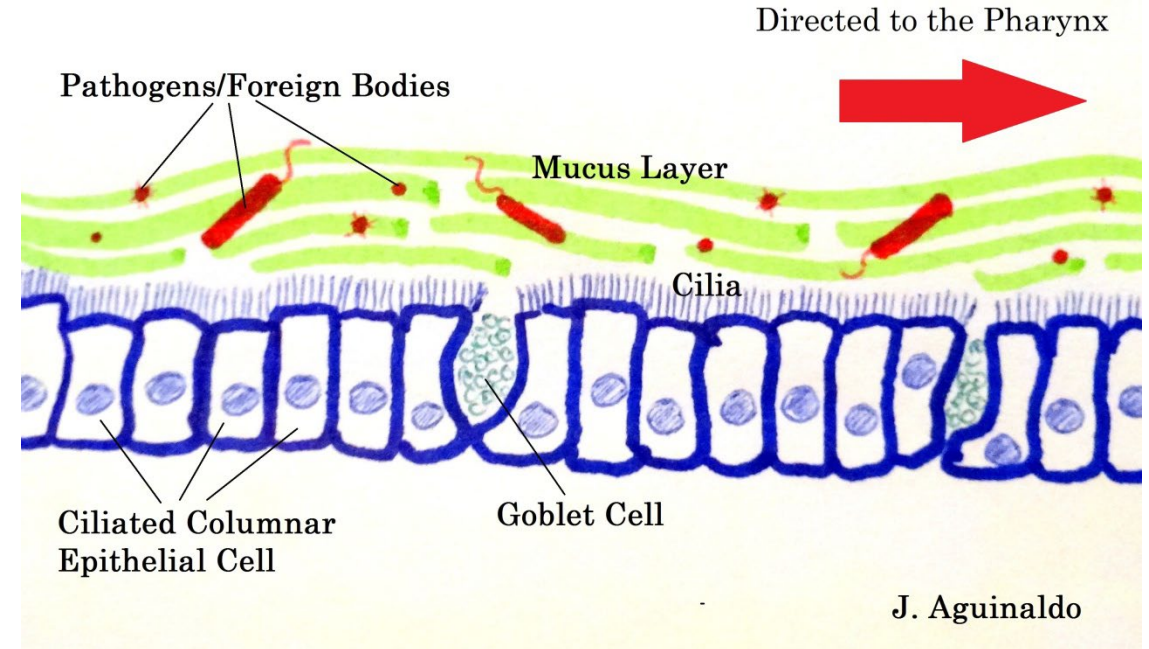
INTRODUCTION: Respiration



INTRODUCTION: Defense Mechanism



Mucociliary Escalator



- Cilia
- Mucus
- Scavenging cells



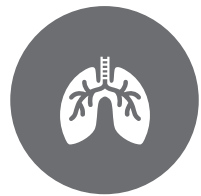


Respiratory system is exposed to the environment in the poultry house:

- Dust originating from:
 - Feed
 - Litter
 - Dried manure
 - Skin and feathers
- Gases generated from:
 - Decomposing of poultry wastes (Ammonia)
 - Emission of chickens
 - Gas burners (CO₂)



INTRODUCTION: Function of the respiratory system



absorption of oxygen,



release of carbon dioxide,



release of heat (temperature regulation),



detoxification of certain chemicals,



rapid adjustments of acid-base balance,



vocalization

Respiratory manifestations

Respiratory manifestations

- Sneeze
- Cough
- Lacrimation
- Nasal discharge
- Respiratory distress (Mouth breathing)
- Facial edema/sinus swelling



Etiology

Viral

- Newcastle disease
- Infectious bronchitis
- Avian Influenza
- Avian Metapneumovirus
- Infectious laryngotracheitis

Bacterial:

- Mycoplasma
- E. Coli
- Salmonella
- Coryza (Avibacterium)

Mycotic:

- Aspergillus

Etiology according to age:

Etiology 0-2 weeks

Viral

- Newcastle disease
- Infectious bronchitis
- Avian Influenza
- Avian Metapneumovirus
- Infectious laryngotracheitis

Bacterial:

- Mycoplasma
- E. Coli
- Salmonella
- Coryza (Avibacterium)

Mycotic:

- Aspergillus

Etiology according to age:

Etiology 2-5 weeks

Viral

- Newcastle disease
- Infectious bronchitis
- Avian Influenza
- Avian Metapneumovirus
- Infectious laryngotracheitis

Bacterial:

- Mycoplasma
- E. Coli
- Salmonella
- Coryza (Avibacterium)

Mycotic:

- Aspergillus

Etiology according to age:

Etiology Semi mature & mature

Viral

- Newcastle disease
- Infectious bronchitis
- Avian Influenza
- Avian Metapneumovirus
- Infectious laryngotracheitis

Bacterial:

- Mycoplasma
- E. Coli
- Salmonella
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Mycotic:

- Aspergillus

**Overview on:
VIRAL RESPIRATORY
INFECTIONS
in poultry.**

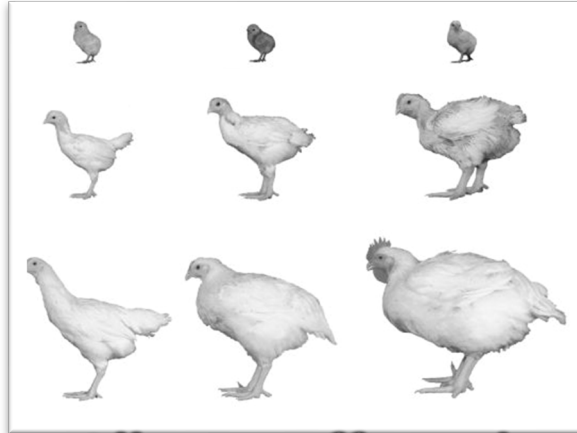


Common features of MOST avian respiratory viruses:

- **Highly contagious.**
 - Spread by direct and indirect contact.
- **Induce high mortality compared to bacterial agents.**
- **Have multi-system affections.**
 - **NDV:** Respiratory, Nervous, Enteric
 - **IBV:** Respiratory, Renal, Reproductive
 - **AIV:**
 - HPAI: Multisystemic including nervous
 - LPAI: limited to Respiratory and Renal
- **Negatively impact egg production (Quantity &/or Quality).**
- **Have immune-suppression effect.**

Newcastle disease

Newcastle disease features



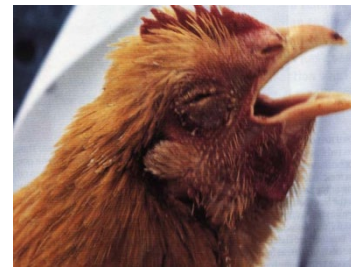
All ages affected



100%



Respiratory



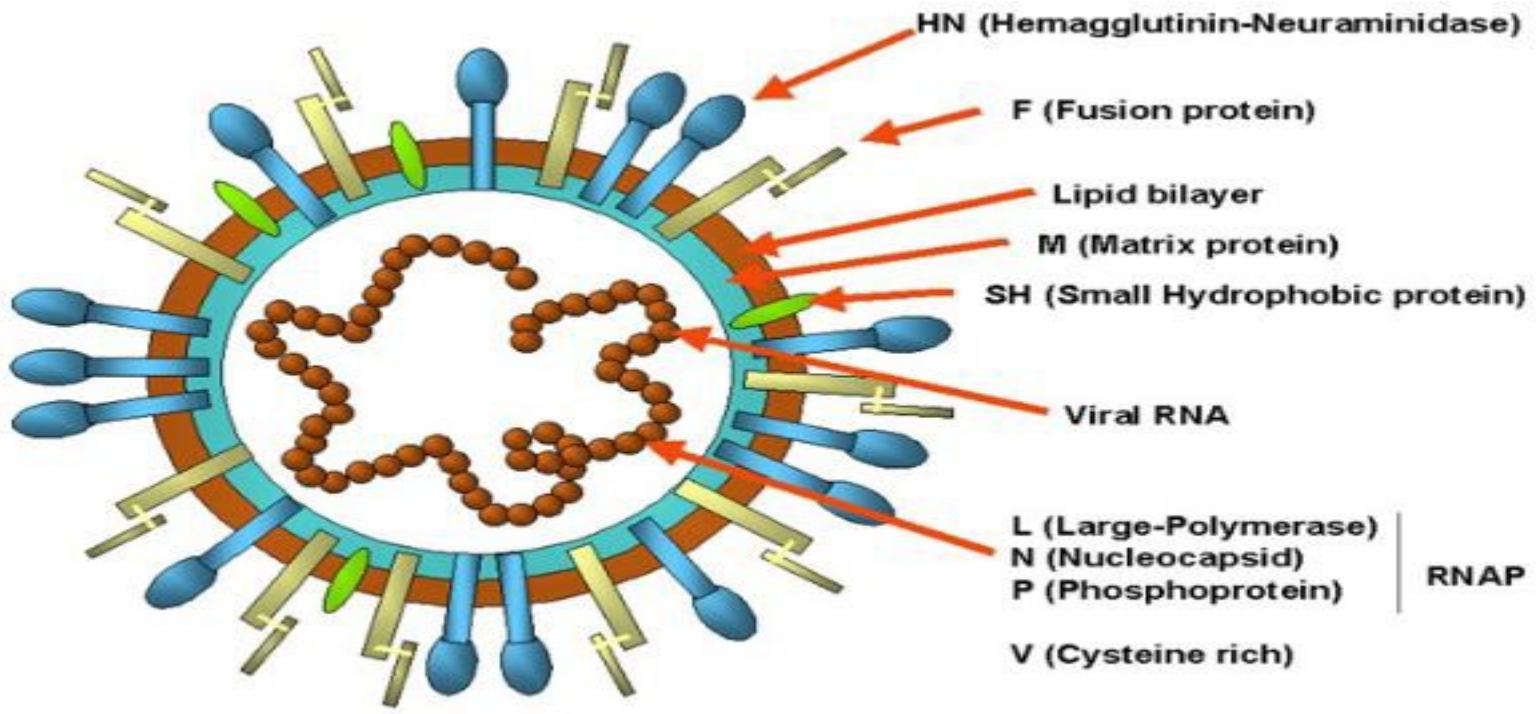
Diarrhea



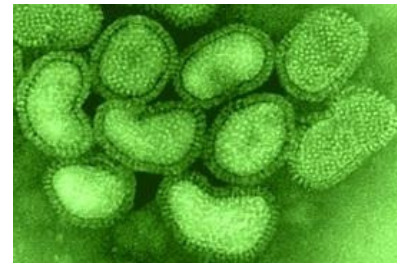
Nervous



NDV



Paramyxoviridae (NDV).
PMV-1
Avulavirus



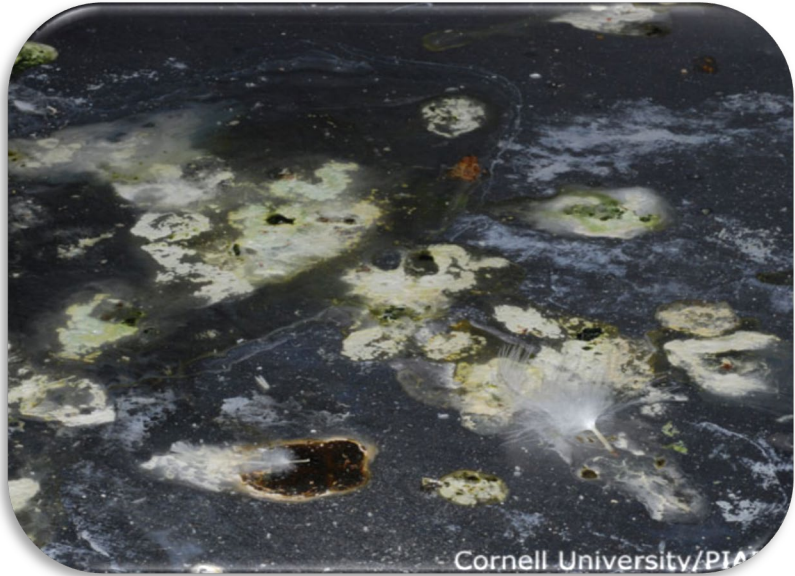
Clinical/pathological pictures

- Depends mainly on:
 - **Pathogenicity of NDV strain:**
 - Velogenic, Mesogenic or Lentogenic
 - **Immune status of the flock**
 - Innate and/or acquired immunity.
- For example:
 - **Mortality reaches 100%** in case of velogenic strains infecting unvaccinated birds.
 - Properly vaccinated immune-competent birds could have **100% protection** from clinical signs and mortality.

Clinical/pathological picture (in broilers) includes:



Nasal discharge



Greenish diarrhea



Conjunctivitis



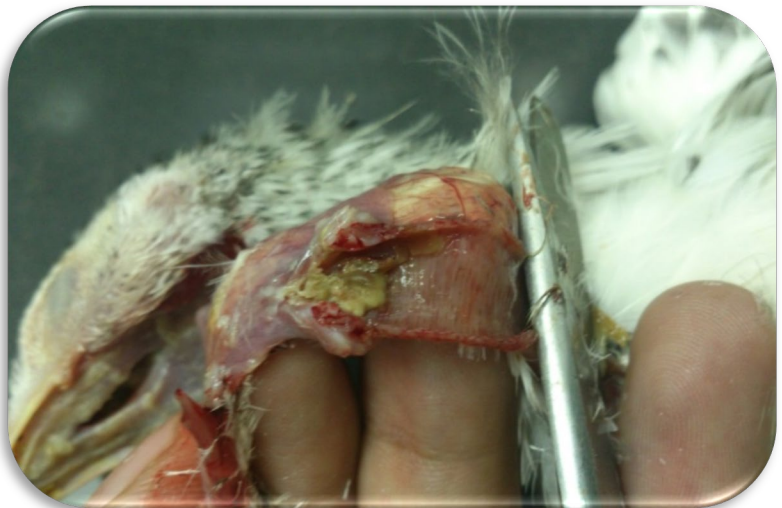
Torticollis

Clinical/pathological picture (in broilers) includes:



General congestion due to septicemia

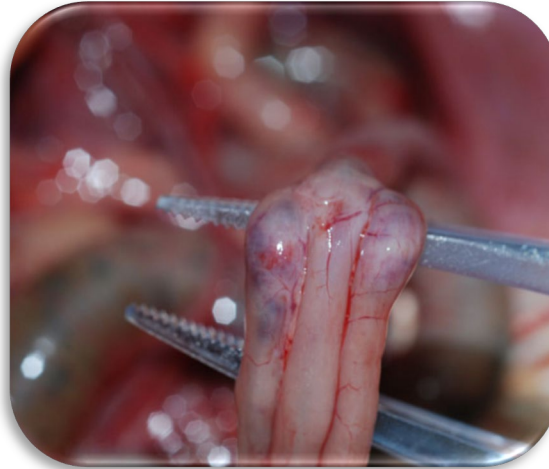
Clinical/pathological picture (in broilers) includes:



Respiratory affections: Tracheitis, Laryngitis and pneumonia

Cornell University/PIAF

Clinical/pathological picture (in broilers) includes:



Enteric affections: Proventriculus, Intestines, Cecal tonsils, Rectum
Spleen: mottled (necrosis)

Infectious Bronchitis

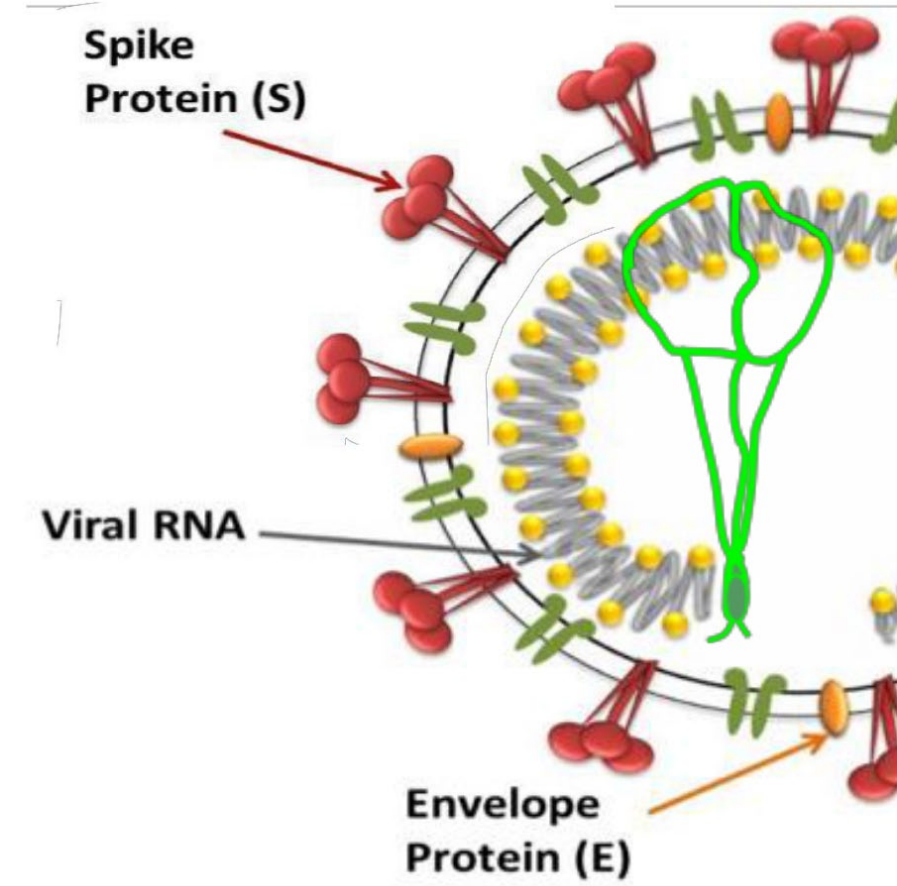
Infectious bronchitis (IB)

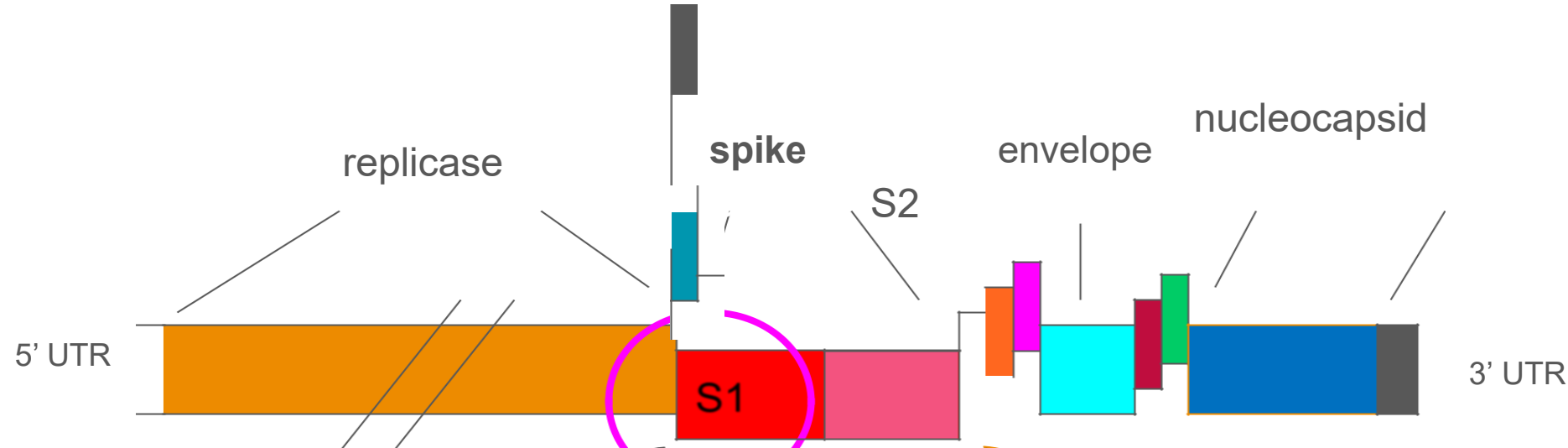
Most frequent respiratory endemic disease

1st described in 1931, ever still present Evolving field viruses

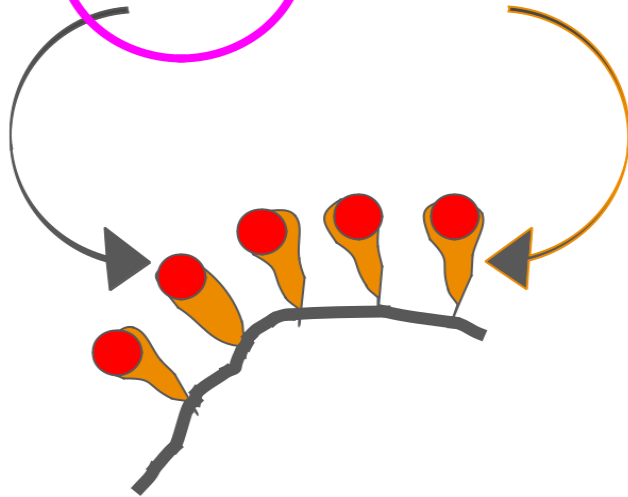
Can infect chickens at every age

- Various clinical signs

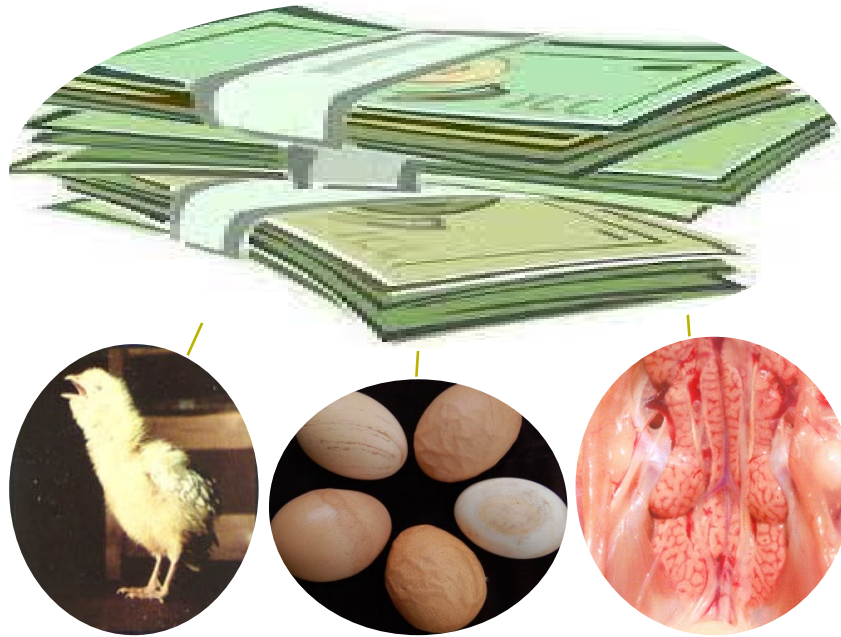




The S1 spike gene codes for the S1 spike protein which is very important in virus variability
Virus envelope



Characteristics of Infectious bronchitis

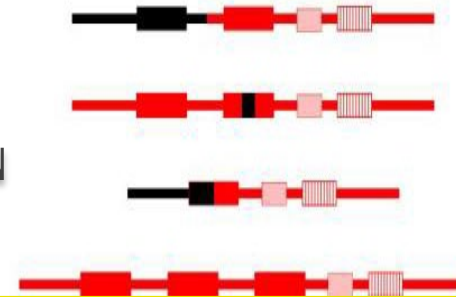


RAPID SPREAD

Continuous evolution of new strains



RECOMBINATION



Very limited cross protection

Clinical/pathological picture

- Depends on:
 - **Tropism of IBV strain:**
 - Respiratory: Mortality due to suffocation..
 - Renal: Higher mortality due to renal failure
 - Renal pathogenicity increased by:
 - Diet (high Protein &/or Calcium), Cold stress.
 - **Co-infection:**
 - Usually, mortality increases due to:
 - Secondary bacterial infection (CCRD)
 - Viral co-infection specially AI-H9
 - **Age of infection:**
 - Broilers (Respiratory and/or renal signs)
 - Layers:
 - Young poults: False layers
 - Adult hens: low egg production - loss of egg quality

Clinical/pathological picture (in broilers) includes:



Lacrimation



Gasping, coughing

Clinical/pathological picture (in broilers) includes:

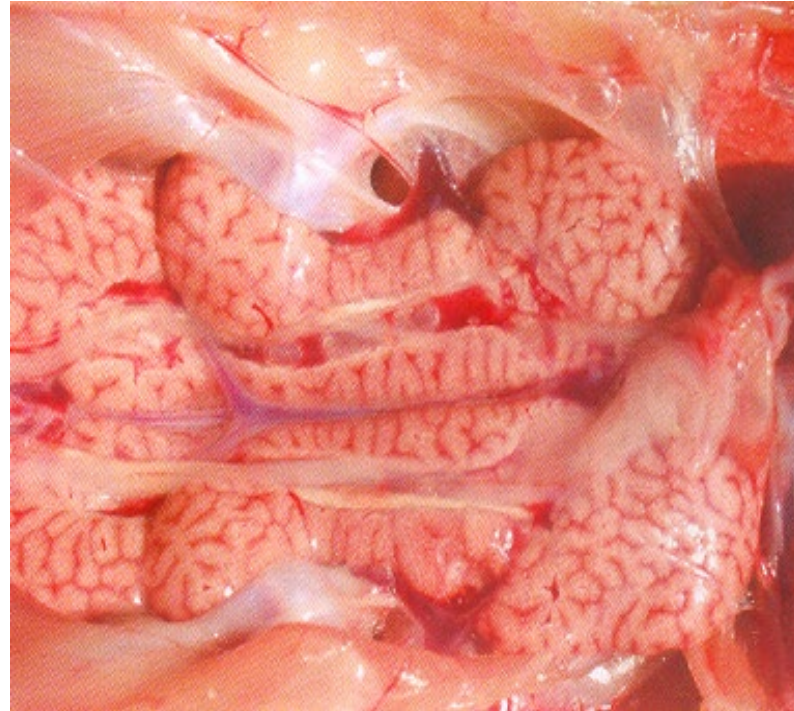


Caseous Tracheitis – Caseous bronchitis (Caseous Plug)

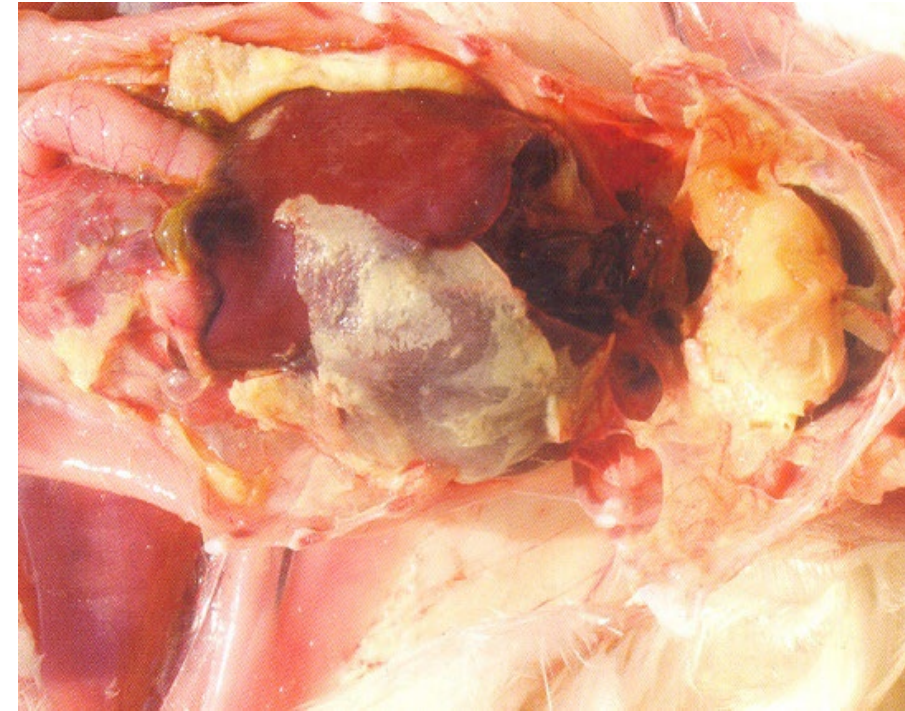
Clinical/pathological picture (in broilers) includes:



Nephrosis , ureters distended with ureates



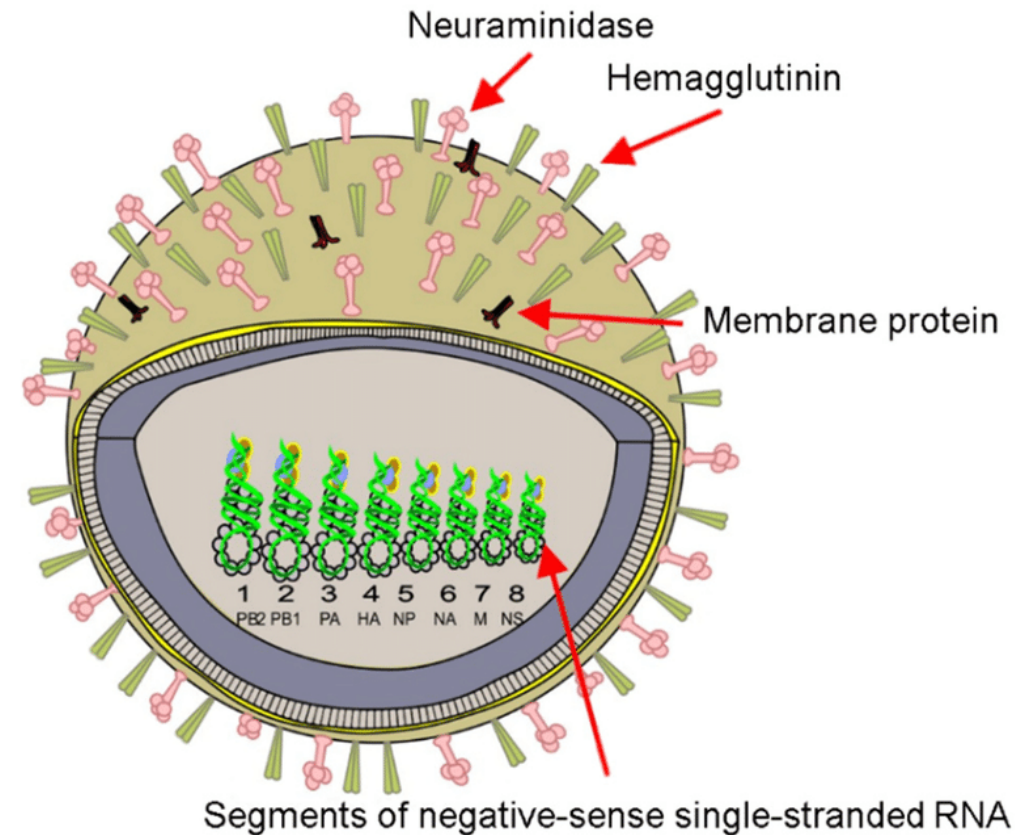
Secondary bacterial infection



Avian Influenza

General features of Avian influenza

- Highly **transmissible**
- Infects mostly **all kinds** of avian species (Wild birds)
- Mainly **two types** of pathogenicity:
 - **Highly pathogenic:** H5, H7
 - Multi-systemic infections
 - **Low pathogenic:** All subtypes
 - Limited to Respiratory and urogenital.
 - Can **evolve** into highly pathogenic viruses.
- **Zoonotic** importance
- **Several subtypes** (HA: 18, NA: 11)
 - **No** cross protection against **different HA** subtypes
 - **Limited** cross protection against **different clades** of same HA subtypes



Clinical/pathological picture: LPAI



Nephrosis



Mild tracheitis



Bronchial cast

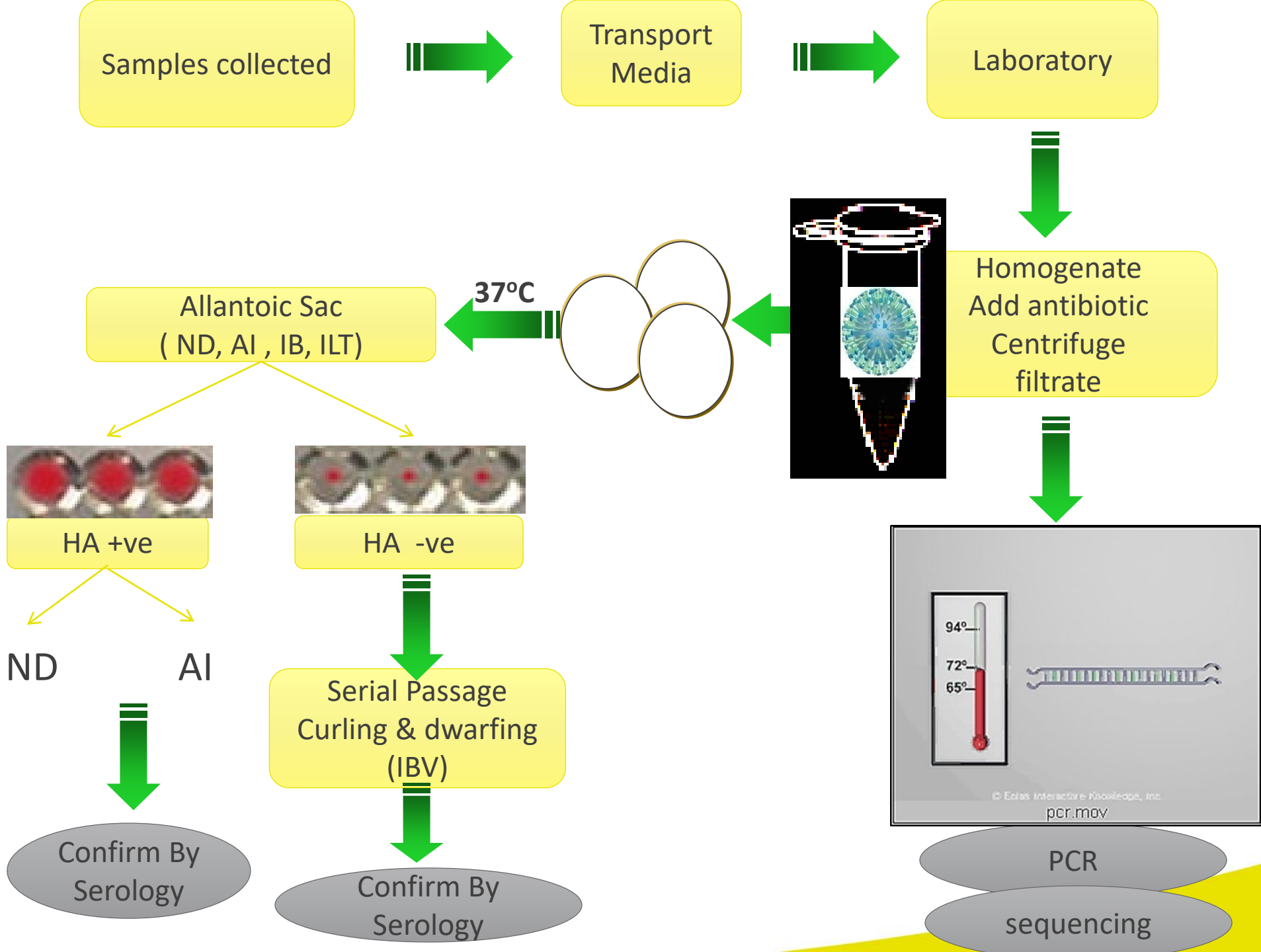
Differential diagnosis



Clinical differential diagnosis

	ND	IB	AI
Species affected and age	Most species All ages	Chickens All ages (Respiratory in young)	All species All ages
signs	Resp./ Nerv. ✓ Facial edema ✓ Green Diarrhea	Resp. ✓ White diarrhea (nephrogenic)	Resp./ Nerv. ✓ Facial edema ✓ cyanosis
septicemia	+	-	+
P.M.	✓ Hemorrhages on alimentary tract. ➤ proventriculus, ➤ cecal tonsils, ➤ payers patches, ➤ Rectum ➤ pneumonia	✓ Caseous plug. ✓ Kidney lesion	✓ Hemorrhages on Serous & mucosal membranes ✓ Hemorrhages on muscles ✓ Red shank ✓ Pancreatic lesion ✓ Pneumonia ✓ Caseous plug. ✓ Kidney lesion





Laboratory differential diagnosis



General rules for successful immunization



General rules for **successful immunization**

- **Matched** serotype/genotype vaccine.
- **Multivalent** vaccines.
- **Inactivated vaccine** for stronger humoral immunity in septicemic diseases.
- **Mucosal administration** (Eye drop or spray) of live vaccines for mucosal immunity is better than drinking water.
- Strictly follow **vaccination instructions**:
 - Vaccine rehydration.
 - Water quality and temperature.
 - Vaccine stabilizers
 - Time of vaccination
- Optimum **managermental environment** for healthy immune system
 - Temperature, Humidity, Ventilation, Density, Feed quality... etc.
- Always remember... **Biosecurity** is irreplaceable by vaccination.

THANK
YOU!



Questions & Answers