

# POULTRY DISEASES

## VIRAL DISEASES

### New Castle Disease

It is one of the most dreaded diseases of poultry as it can cause very heavy mortality at a very high speed. The disease is caused by a virus of paramyxo group and classified into many serotypes based on the virulence. Chicken is the natural host but vast majority of birds are susceptible to infection including ducks and turkey .

#### Signs

- Depression, prostration, loss of appetite
- Greenish/yellowish diarrhea
- Nervous signs like in coordination, twitching of neck
- Mortality heavy in acute outbreak



*Greenish diarrhoea*

#### Post Mortem Lesions

- Pin pointed hemorrhages at the tip of proventricular glands
- Hemorrhagic/ diphtheritic ulcers on the intestine and caecal tonsils



*Pro ventricular Hemorrhage*

#### Diagnosis

Typical lesions are diagnostic. Laboratory diagnosis with hemagglutination and Inhibition tests can be employed.

### Treatment and Prevention

Effective vaccines are available for prevention. F vaccine given at the day old stage followed by RDK vaccine at 2 months can protect the bird.

### Infectious Bronchitis

It is a highly infectious viral disease of poultry of worldwide distribution. It can affect any age, breed or type. Chicken is the only bird that is naturally infected by this virus. There are different serotypes of IB virus and many strains continue to evolve.

#### Signs

- Respiratory signs like coughing, sneezing and rales in chicks
- Drop in egg production and hatchability
- Production of deformed, thin shelled, rough eggs with low internal egg quality
- Mortality low in uncomplicated cases



*Eggshell abnormalities*

#### Post Mortem Lesions

- Catarrhal exudates in nasal cavity, caseous plugs in bronchi in chicks
- Enlargement of kidney with urates deposition and distention of ureters with pasty uric acid in uraemic form
- Egg peritonitis in layers

#### Diagnosis

Lesions are suggestive and can help in diagnosis. ELISA can also give a reliable diagnosis.

#### Prevention

Vaccines are available for prevention.

### Infectious Bursal Disease (Gumboro Disease)

Infectious Bursal Disease (IBD) is a highly contagious viral disease of young chicken causing serious eco-

conomic losses. The virus targets the Bursa of Fabricius, an important part of immune system making the bird susceptible to other infections. Vaccination failures may happen due to the associated immunosuppression.

### Signs

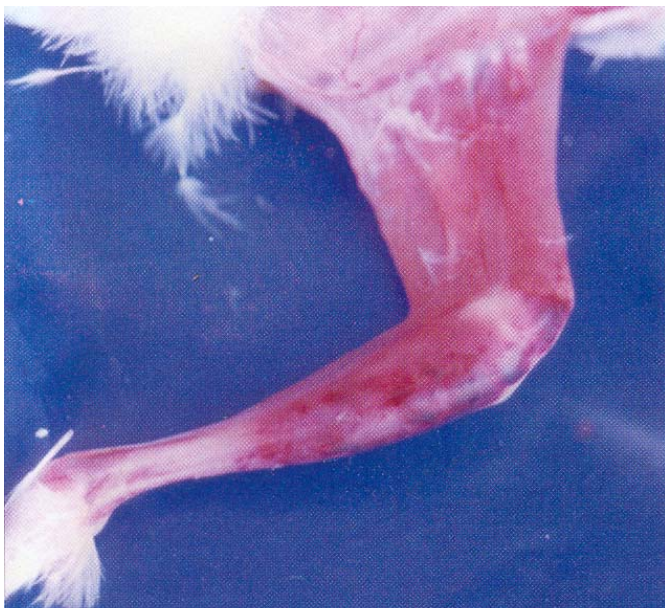
- Dullness, depression and death
- Whitish diarrhea
- Mortality heavy in the initial out breaks in a farm

### Post Mortem Lesions

- Hemorrhages in the thigh and pectoral muscles
- Bursa enlarged, edematous and hyperemic with bloody or mucoid contents inside.
- Bursa firm and atrophic in chronic form
- Kidney may show nephrosis and mottling



*Bursal Hemorrhage*



*Muscular Hemorrhage*

### Diagnosis

Bursal lesions are characteristic. Age of the birds affected and muscular lesions help in diagnosis.

### Prevention

Vaccines are available for prevention.

### Avian Influenza

Highly Pathogenic Avian Influenza (HPAI) is a highly lethal systemic disease affecting vast majority of birds caused by the Influenza Type A virus. Because of the zoonotic as well as pandemic potential, the disease gained much public health importance. Water birds and migratory birds act as carriers and spread the infection.

### Signs

- Sudden, heavy and unusual mortality reaching almost 100% without any clinical signs
- Edema of face, cyanosis of comb and wattles in less fulminating cases
- Nervous disorders like tremors, torticollis and opisthotonus



### Post mortem lesions

- Extremely variable depending on the severity
- Hemorrhagic lesions (petechial to ecchymotic) on all the visceral organs, serous membranes, skin and muscles in acute cases
- Lungs pneumonic
- Enteritis, air sacculitis, splenomegali

### Diagnosis

Sudden, heavy, unusual mortality arise the suspicion. The disease is to be differentiated from the other fulminating diseases of chicken like Newcastle Disease, IBD, Fowl cholera etc.

### Prevention

Currently vaccines are not used in India.

### Avian Pox

Pox is a common viral disease of commercial poultry mainly chicken and turkey. It is considered as economically important as it causes drop in egg production. Mortality though mild in cutaneous form, may become high with generalized infection.

### Signs

- Nodular lesions on comb, wattles, eyelids and other non feathered areas of skin in cutaneous form

- Mild respiratory signs
- Unthriftness and reduced production



**Post mortem lesions**

- Nodular lesions on the non feathered areas
- Diphtheritic yellowish lesions on mouth, esophagus and upper part of trachea in diphtheritic form(wet pox)



**Diagnosis**

Clinical signs, lesions and mortality pattern are sufficient for a field diagnosis.

**Avian Encephalomyelitis**

Avian encephalomyelitis (AE) is an infectious viral disease affecting young chickens, quail and turkeys characterized by ataxia and tremors of head and neck. Baby chicks of 1 to 2 weeks age are most severely affected. AE is an egg born infection. Adult hens get symptomless infection.

**Signs**

- New born chicks show paralysis in the first week

after hatching

- Progressive ataxia and incoordination
- Tremors of the head and neck become evident especially after exciting the chicks
- Mortality rate vary from outbreak to outbreak



**Post mortem lesions**

- No gross lesions are observed
- Minute whitish/grayish spots in the muscles of gizzard in a few case

**Diagnosis**

Age of the birds and symptoms are helpful in establishing tentative diagnosis.

**Prevention**

Screening of breeding stock for infection and immunization of breeding stock prevent the transmission of virus through eggs.

**Reoviral Arthritis**

Reoviruses have been associated with many diseases in chicken like arthritis, enteritis, nephrosis and runting syndrome.

Reoviral arthritis affects mainly broilers of 6 to 7 weeks age. Turkeys are also susceptible.

**Signs**

- Lameness
- Synovial sheaths of the tendons of foot pads or hock joints are inflamed and swollen

**Post mortem lesions**

- Foot pads and hock joints are swollen with purulent fluid



## Diagnosis

Age of the birds affected and symptoms help in arriving a tentative diagnosis. ELISA, AGPT are used as laboratory tests.

## Adenoviral Infections

There are many important disease conditions in poultry associated with adenoviruses.

### Egg Drop Syndrome

- Sudden and variable drop in egg production (30-40%) in laying hens
- Production of depigmented, cracked or shell less eggs
- Disease runs for a few weeks and egg production returns to normal.



### Inclusion Body Hepatitis (IBH)

- Broilers of 4 to 8 weeks are affected mainly
- Anaemia, depression and sudden mortality
- Hepatitis
- Pale muscles and bone marrow
- Hemorrhages in the muscles

### Hydro pericardium syndrome (Leechi's Disease)

- Sudden heavy mortality in well nourished birds
- Impacted crop
- Straw colored clear fluid around the heart
- Enlarged liver
- Anaemia

## NEOPLASTIC DISEASES

### Marek's Disease

Marek's Disease is an economically important viral disease but more or less effectively controlled by vaccination. It is principally a disease of young chicken but rarely affects other birds also. Chicken below 3 to 4 months are more susceptible.

#### Signs

- Dullness, depression and sudden death in acute form (MD lymphomas)
- Incoordination, staggered gait, paralysis of one or more extremities in classical form (Neural form)
- Unilateral or bilateral blindness with ocular involvement

## Post mortem lesions

- Tumors (lymphomas) are present in one or more of visceral organs and tissues. Gonads (ovary), liver, spleen, lungs, kidney, skin etc may be involved. Tumors cause nodular or diffuse enlargement of the affected organ. Bursa is rarely affected.
- In classical form, nerves become thickened slightly or as much as 3 or 4 times the normal and becomes rounded instead of the normally striated appearance.



## Diagnosis

Progressive paralysis in sexually immature birds with nervous lesions is helpful in diagnosis. Visceral lymphomas are to be differentiated from lymphoid leukaemia by histopathological examination. Age of the birds affected, presence of lymphomas in skin, bursa etc gives clues for field diagnosis.

## Prevention

The disease is not curable. Prevention is the only method. Vaccination, increasing the genetic resistance in breeders and eliminating the susceptible one from breeding flocks are the recommended methods of prevention.

## Lymphoid Leukosis

**Lymphoid** leukosis has been the most common form of leukosis group of diseases seen in field flocks and is known to be of significant economic importance. It is caused by retrovirus. Chicken are the natural hosts. Sexually mature birds are the commonly affected

#### Signs

- Mostly non specific
- Inappetance, weakness and emaciation

## Post mortem lesions

- Grossly visible tumors in liver, spleen, bursa

and other visceral organs.

- Skin is not affected and bursa is almost invariably affected
- Tumors are soft, smooth and seldom has areas of necrosis and cause diffuse or nodular enlargement of the organ



### Diagnosis

Presence of visceral tumors in sexually mature birds with involvement of bursa and absence of skin tumors are helpful in differentiating from Marek's lymphomas.

### Bacterial Diseases

#### Fowl cholera

Fowl cholera (avian pasteurellosis) is an acute contagious septicaemic disease with high morbidity and mortality. But chronic form often occurs. *Pasteurella multocida* is the causative agent. Chicken, turkey and ducks are commonly affected. However the disease affects other type of birds also.

#### Signs

- Fever, anorexia, mucous discharge from the mouth
- Diarrhoea, dehydration
- Cyanosis of combs and increased respiratory rates
- Odema of comb, wattles, sinusitis and arthritis in chronic form

#### Post mortem lesions

- Petechial hemorrhages on heart, serosa of intestine, abdominal fat
- Generalized visceral congestion
- Enteritis
- Pneumonia and catarrhal inflammation of respiratory passages
- Pin pointed necrotic spots on hepatic parenchyma
- Fibrinous peritonitis, congested and ruptured ova in layers

### Diagnosis

Sudden onset, high mortality, septicaemic lesions on post mortem and presence of large number of bipolar organisms in blood smears and tissue smears help in field diagnosis.

### Treatment

Sulpha drugs are better choice as they can be administered in water. Other antibiotics like strepto-



sumption, decreased fertility and hatchability, diarrhea, depression and dehydration.



### Post mortem lesions

- No gross lesions are seen in early stages in chicks
- Unabsorbed yolk, discoloured and coagulated yolk
- Congestion of liver with necrotic spots
- Pericarditis
- Enteritis and cheesy core in the caecum

### Diagnosis

Heavy mortality in incubator and in very young chicks with diarrhea must arise the suspicion. Laboratory isolation is necessary for confirmation. Whole blood agglutination test may be used in field to identify carriers and survivors.

### Prevention

Frequent screening of breeding flocks helps to control the infection in chicks. Strict zoo sanitary measures are to be adapted in face of outbreak.

### Treatment

Antibiotic treatment may reduce the mortality but does not prevent the birds from becoming carriers.

### Colibacillosis (*E. coli* infections)

Avian pathogenic *Escherichia coli* are associated with many disease conditions in poultry mainly colisepticaemia, air sac disease, coligranuloma, omphalitis in chicks, peritonitis in layers, synovitis and sinusitis. *E. coli* are important pathogens in bad management and stress and is the most common complicating organisms in other viral and respiratory infections.

### Signs and Post mortem lesions

#### Colisepticemia

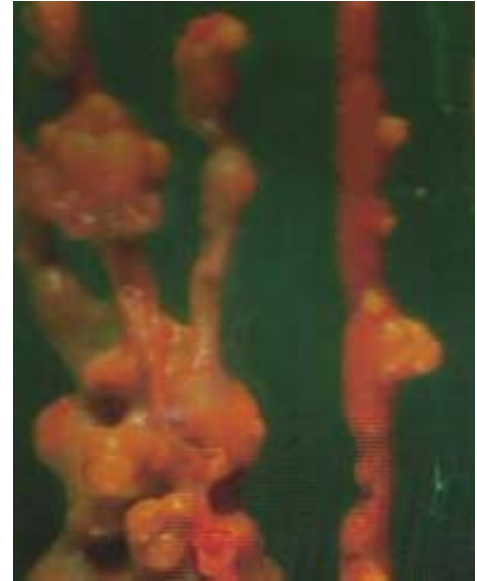
- Diarrhoea, loss of appetite, dyspnoea
- Fibrinous pericarditis, perihepatitis and air sacculitis
- Dark liver
- Mortality may be heavy in chicks



#### Coligranuloma

- Nodules of millet seed sized or larger in duodenum, ceca, liver and mesentery

- Mortality may be heavy when flock is affected



### Sinusitis (Swollen Head Syndrome)

- Swelling of head with inflammatory exudates
- Periorbital inflammation

### Arthritis/Synovitis

- Common sequel to colisepticemia in turkeys
- Mild to severe lameness, progressive paresis and paralysis
- Joints are enlarged
- Greenish discoloration of liver

### Salpingitis/Peritonitis in Adults

- Common cause of mortality in layers
- Decreased egg production and sporadic mortality
- Yellowish fibrinous or purulent material found in the abdominal cavity
- Large caseated masses in abdominal cavity



### Omphalitis (Yolk sac disease) in chicks

- Heavy mortality in newly hatched chicks
- Inflammation of navel
- Abdomen is distended and blood vessels hyperaemic
- Yolk is abnormal colour, cloudy and foul smelling



### Enteritis

- Common in broilers and breeders
- Diarrhoea, emaciation and weakness
- Duodenum inflamed

### Diagnosis

Clinical signs, lesions and laboratory isolation are used for diagnosis

### Treatment

E. coli are susceptible to many drugs. Antibiotic sensitivity testing is advisable as the organisms are frequently resistant to one or more drugs.

### Prevention

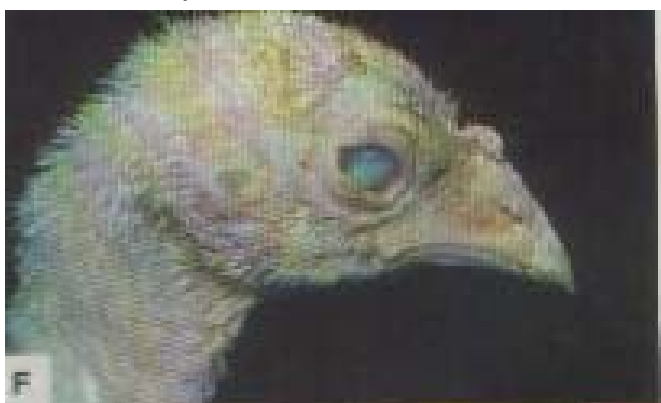
Improving the managemental practices and hygiene and avoiding undue stress are important in prevention as the organism is an opportunistic pathogen.

### Infectious Coryza

It is an acute respiratory disease of chickens caused by *Haemophilus paragallinarum*.

### Signs

- Serum to mucoid nasal discharge
- Facial odema,
- Cojunctivitis



### Post mortem lesions

- Catarrhal inflammation of nasal passages and sinuses
- Subcutaneous odema of face and wattles
- Catarrhal conjunctivitis

### Diagnosis

Clinical signs and lesions are helpful. The disease

must be differentiated from other organisms causing swollen head like E.coli, Pasteurella, mycoplasmosis and A –vitaminosis by laboratory isolation.

### Avian Mycoplasmosis

Avian mycoplasmosis, commonly known as CRD (Chronic Respiratory Disease) of chicken and infectious sinusitis of turkey are caused by *Mycoplasma gallisepticum*. The disease is usually complicated by secondary bacteria like *E.coli* and viral infections like Infectious bronchitis.

Infectious synovitis commonly seen in growers is caused by *Mycoplasma synoviae*.

### Signs

#### Chicken :

- Tracheal rales, nasal discharge and coughing
- Facial edema and lacrimation
- Feed consumption is reduced
- Egg production declines
- Joints may be affected



#### Turkeys:

- Sinusitis, swelling of paranasal sinuses
- Partial to complete closure of eyes
- Respiratory distress, depression, cough
- Synovitis

#### Post Mortem Lesions

- Catarrhal exudates in nasal and paranasal passages, trachea and bronchi
- Air sacculitis with caseous exudates
- Pericarditis and perihepatitis in complicated infections
- Sinusitis prominent in turkey
- Synovitis with thick creamy or cheesy material in synovial sacs of joints.

### Diagnosis

Clinical signs and serological procedures are useful in field diagnosis and control programs. ELISA is commonly employed in diagnostic laboratories for diagnosis.

## Treatment

Tylosin and Tiamulin were reported to be effective in treatment and prevention.

## Clostridial Diseases

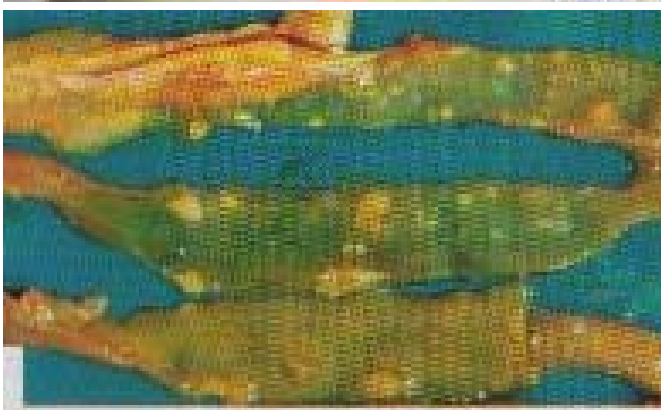
A number clostridial organisms have been associated with diseases in poultry. *C. perfringens* and *C. septicum* cause necrotic enteritis and gangrenous dermatitis. *C. colinum* is the cause of ulcerative enteritis.

### Signs

- Depression, decreased appetite, ruffled feathers
- Diarrhoea
- Clinical course is very short

### Post mortem lesions

- Intestine often friable and distended with gas
- Mucosa of small intestine ulcerative/ necrotic and thick and later forms diphtheritic membrane
- Liver swollen, dark colored with necrotic foci



### Diagnosis

Typical gross lesions of intestine with liver lesions and presence of large number of large gram positive bacilli with terminal spores in the intestinal scrapings smear are sufficient for field diagnosis.

### Treatment

Streptomycin, bacitracin and oxytetracycline have been shown to be effective in prevention and control.

Excessive feeding of fish meal predisposes the infection.

## Botulism

Botulism is an intoxication caused by exotoxin of *Clostridium botulinum*. Free ranging birds are mostly affected.

### Signs

- Flaccid paralysis of legs, wings, neck and eyelids
- Paralysis progress cranially
- Reluctant to move and lame

### Post mortem lesions

- Gross lesions are lacking

### Diagnosis

Clinical signs, lack of gross lesions are suggestive.

## Treatment

Isolation and provision of drinking water may help in the recovery of some sick birds.

## Avian tuberculosis

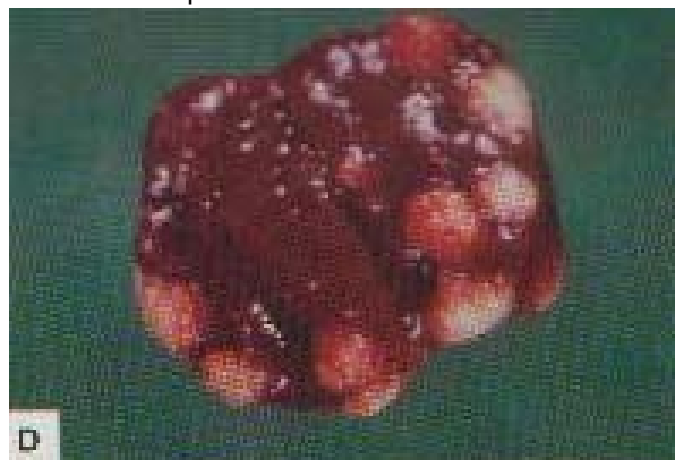
Avian tuberculosis is a chronic infection caused by *Mycobacterium avium*. Though rare in commercial farms, still occurs sporadically in backyard poultry.

### Signs

- Progressive and striking loss of weight in spite of good appetite
- Atrophy of breast muscle
- Comb, wattles and ear lobes appear pale, thin and dry

### Post mortem lesions

- Pin point to large yellowish or grayish white nodules in liver, spleen, intestine and bone marrow
- Rupture of liver



### Diagnosis

Clinical signs, lesions and presence of acid fast bacilli in the smears prepared from the lesion are sufficient for a diagnosis



## Treatment

Impractical and rarely advised. Considering the zoonotic potential, removal of the affected one may be the best approach.

## FUNGAL DISEASES

### Aspergillosis

Aspergillosis (Brooder pneumonia) is an acute respiratory disease primarily of chicks caused by the genus *Aspergillus*. Infections are acquired from the environment and the outbreak is more common in wet, humid areas where contaminated litter acts as a source. Chicks below 10 days old are more susceptible.

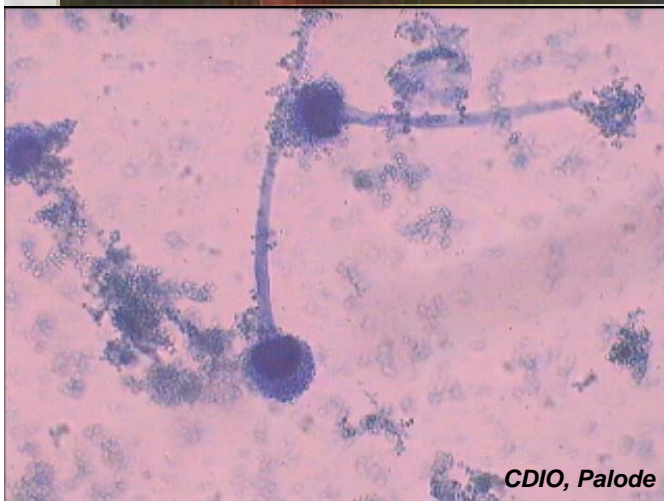
Systemic Aspergillosis also occurs less frequently.

### Signs

- Dyspnoea, depression and emaciation
- Diarrhea in later stages

### Post mortem lesions

- Whitish military foci in air sacs membranes
- Small pin head sized whitish nodules in the lungs
- Lesions in other organs in advanced generalized cases



## Diagnosis

Lesions are characteristic. Age of the birds affected and detection of fungal hyphae in the lesion

material prepared as wet mount also aid field diagnosis. Confirmation should be made by cultural isolation.

## Prevention

Provision of dry litter and adequate ventilation are essential. Moldy litter or feed should be avoided. During outbreak, infected litter/feed should be burned off.

## PARASITIC DISEASES

### Round Worm Infections

*Ascaridia galli* is the most common round worm of poultry. It may not significant mortality but may retard growth and egg production.

### Signs and lesions

- Lack of appetite
- Retardation of growth
- Anaemia and diarrhea in heavy infection
- Heavy load can lead to intestinal blockage and death
- Worms are found in the lumen of intestine occasionally in the esophagus, gizzard and crop



## Prevention

Regular deworming can prevent the infection.

## Coccidiosis

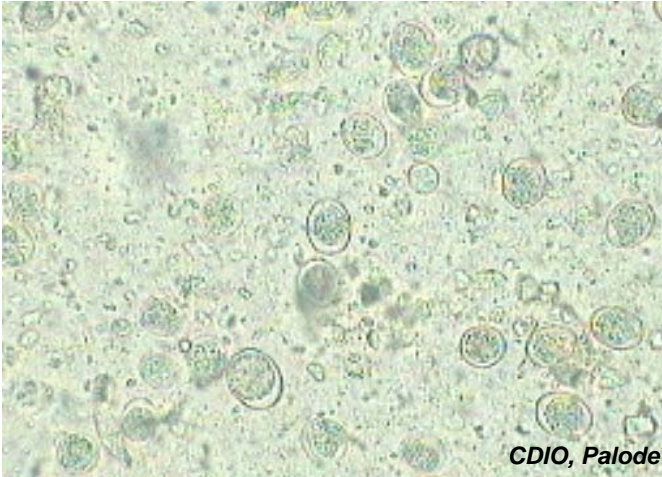
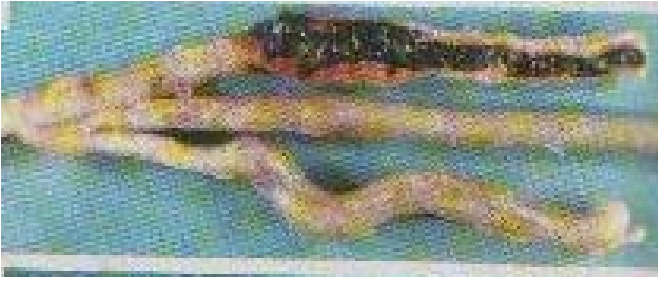
Coccidiosis is one of the most common diseases of poultry. Caecal coccidiosis caused by *Eimeria tenella* and intestinal coccidiosis caused by several species of *Eimeria* causes significant economic losses in poultry industry. Severity of the infection vary with the isolate, number of oocyst ingested and immune status of the bird.

### Signs

- Depression, loss of appetite
- Emaciation, poor growth
- Bloody diarrhoea

### Post mortem lesions

- Caeca filled with blood tinged contents and caecal wall show patchy hemorrhages in caecal coccidiosis



- Hemorrhagic pin point spots in intestinal mucosa and hemorrhagic enteritis in intestinal coccidiosis

#### Diagnosis

Presence of characteristic gross lesions and detection of large number of oocysts in the contents and scrapings of the affected mucosa are diagnostic.

#### Treatment

Anticoccidial drugs like sulphonamides are effective in outbreaks. It is essential to destroy the contaminated litter. Anticoccidial drugs may be used in feed in preventive doses.

#### Syngamiasis(Gape worm infection)

*Syngamus trachea* is the causative agent of "gapes" in chicken, turkey and pheasants. Young birds are most seriously affected. The worm may obstruct the trachea and cause the birds to suffocate.

#### Signs

- Gaping movements, labored breathing
- Cough

#### Post mortem lesions

- Slender, reddish worms attaching to tracheal mucosa
- Inflammation of tracheal mucosa
- Anemia



#### Diagnosis

Characteristic signs, presence of worms in the trachea and characteristic eggs in the feces are diagnostic.

#### Treatment

Thiabendazole orally has been used successfully.

#### Prevention

Moist localities where earthworms and snails occur should be avoided for poultry rearing. Rearing for long periods on the same ground should be avoided if possible.

#### MISCELLANEOUS

##### Mycotoxicosis

Mycotoxicosis, a disease caused by the toxic metabolite of fungi, causes serious impact on poultry industry directly and indirectly. Poultry are susceptible to many mycotoxins of which aflatoxin, ochratoxin etc draws considerable attention. Mycotoxicosis impairs all important production parameters. Effects may be acute or chronic. Many mycotoxins are immunosuppressive.

#### Signs

- Non specific
- Inappetance, reduced growth
- Drop in egg production
- Mortality rate vary depending on the level of toxicosis

#### Post mortem lesions

- Liver friable, enlarged, congested and hemorrhagic
- Liver shrunken, firm and nodular in chronic cases
- Gall bladder distended
- Kidneys enlarged and congested
- Ascitis and hydropericardium in more chronic cases



## Diagnosis

Post mortem lesions and signs are not specific. If suspected, feed should be tested for the detection of toxins.

## Visceral Gout

Visceral gout is a common finding during necropsy of poultry. Many factors are attributed for outbreaks in poultry such as

- High protein diet
- Vitamin A deficiency
- High salt/calcium level in the feed
- Fungal toxins in feed
- Diseases of kidney
- Infectious causes like IB, Reo viral infection

## Post mortem lesions

- Whitish chalky deposits on serous membranes, heart, liver etc.
- Kidney swollen, mottled and grayish
- Uraters dilated with white pasty material



## Prevention

Removal of the possible cause, adequate supply of Vitamin A, water and change of feed are to be adopted in face of outbreak.

## Ascitis Syndrome

The disease is mostly seen in grower chicks in

broilers and has a complex etiology. Pulmonary hypertension causing right ventricular atrophy and failure has been considered the main cause.

## Signs

- Abdominal distension
- Reluctant to move

## Lesions

- Presence of excess straw coloured watery fluid with or without fibrin in abdominal cavity
- Hydropericardium
- Subcutaneous tissue appear jelly like

## Treatment

Change of feed, supplementation of phosphorus and diuretics may reduce the mortality.

## DEFICIENCY DISEASES

### Vitamin A deficiency

It is a commonly encountered disease in poultry.

## Signs

- Weakness
- Retardation of body growth
- Ruffled feathers
- Conjunctivitis in advanced cases
- Table eggs may show blood spots



## Lesions

- Vesicles or pustules on the oesophageal mucosa
- Cheesy exudates on the mouth, esophagus and upper respiratory tract
- Urate deposition in kidneys and other organs
- Cheesy core in the bursa

## Rickets

Deficiency or imbalance of calcium, phosphorus and vitamin D is the suggested etiology

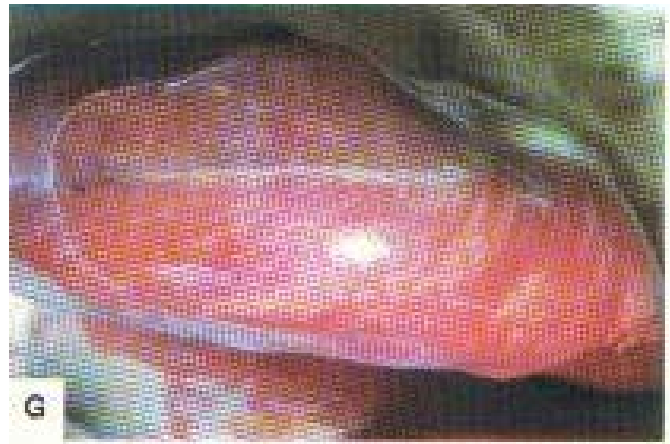
## Signs

- Stunted growth
- Sit on the hock
- Incoordination of movements
- Thin shelled eggs in layers

## Lesions

- Nodular swelling at the costochondral junctions of ribs
- Bending of keel bone

- Bones soft and flexible



### B Vitamin deficiency

- Pulling of the head towards neck (star gazing) in B1 deficiency
- Perosis
- Inward curling of toes in B 2 deficiency
- Sitting on hocks
- Paralysis
- Stunted growth, staggering

### Diagnosis

Suggestive features of deficiency diseases are most or many birds in a flock show similar lesions, mortality not sudden or serious and good response after supplementation of specific nutrient.



### Vitamin E and/Selenium deficiency

- Nervous signs
- Paralysis
- Hemorrhages in cerebellum
- Subcutaneous edema
- Muscular degeneration , necrosis & dystrophy
- Enlarged hock

