

*SALMONELLOSIS

Definition:

Avian salmonella infections are important as both a cause of clinical disease in poultry and a source of food-borne transmission of disease to humans. Salmonellae can cause three diseases in the poultry are:

1. Pullorum disease:

Definition:

An acute or chronic infectious disease of young poultry caused by a bacterium and characterized by white diarrhea and pinpoint areas of necrosis in visceral organs with white chalky diarrhea.

Synonyms: Bacillary White Diarrhea (BWD).

Etiology:

Anon-motile bacterium , *Salmonella pullorum*. The organism highly host adapted to chicken and turkeys, is a gram-negative bacillus resistant to cold, sunlight, drying and disinfectants.

Incubation period:

From 4 to 5 days.

Susceptibility:

Chickens and Turkeys are most susceptible, Game birds , Pheasant, Partridge and Quail can become infected but Infection in mammals is rare.

Transmission:

1. Primarily by through the egg from hen to chick.
2. Contaminated incubators, hatchers, chick boxes, houses, equipment, visitors and carrier birds.

Clinical signs:

1. Depression, drooping, chilling and weakness.
2. Excessive numbers of dead-in-shell chicks and deaths shortly after hatching.
3. Chalk white feces and pasted vent.
4. The mortality in extreme cases can be reach 100%.
5. A sub acute form can be seen lameness and swollen hock joints in growing birds.
6. Pale and shrunken combs in older birds .

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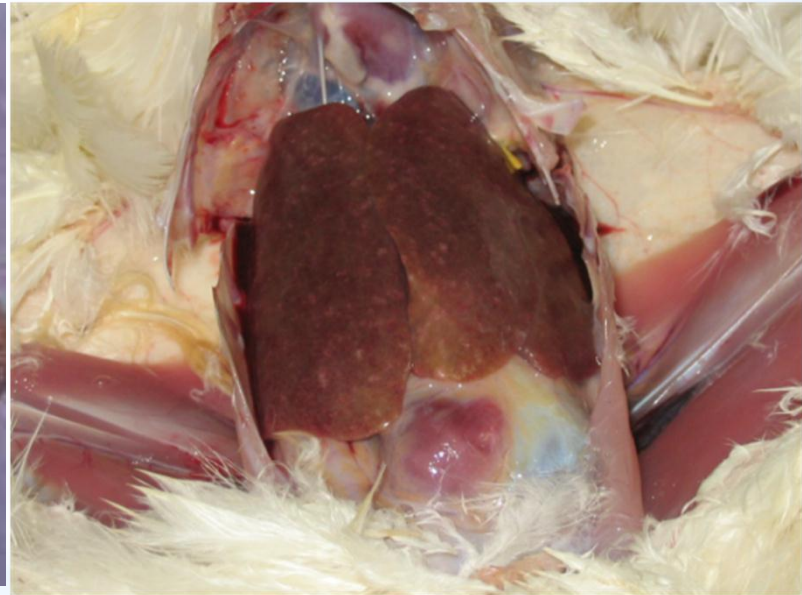
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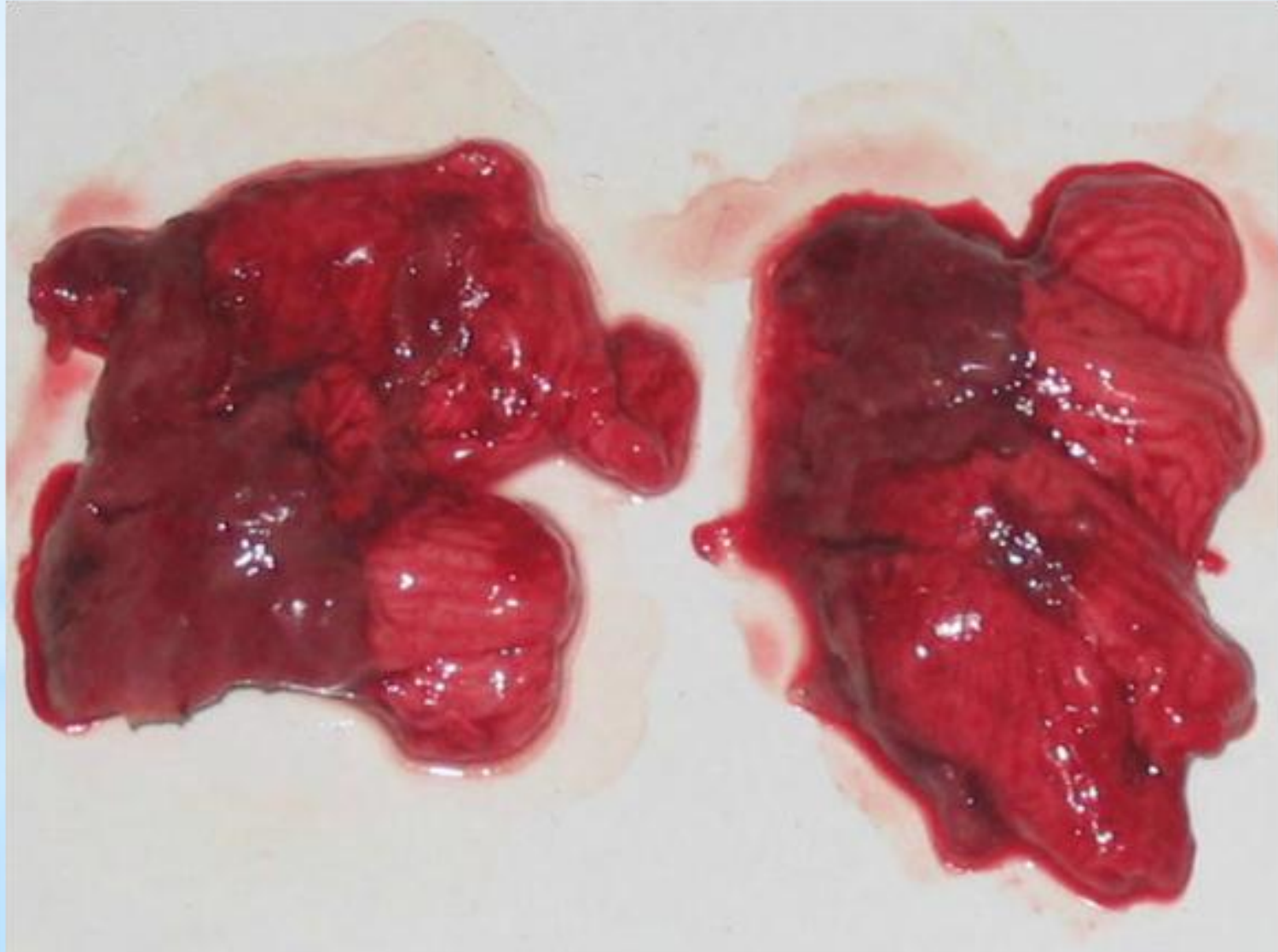
P.M. Lesions:

1. Pinpoint necrosis of heart, liver and lung.
2. The lungs may be congested and the liver dark and swollen with hemorrhages visible on the surface.
3. **Typhlitis**: the ceca are enlarged and distended with cheesy cured- like cores.
4. **Past vent**.
5. In adult hen birds, the characteristic lesion which found are an abnormal ovary with the irregular, cystic and misshapen, may be also present peritonitis, arthritis and pericarditis.
6. **Omphalitis** is often present.

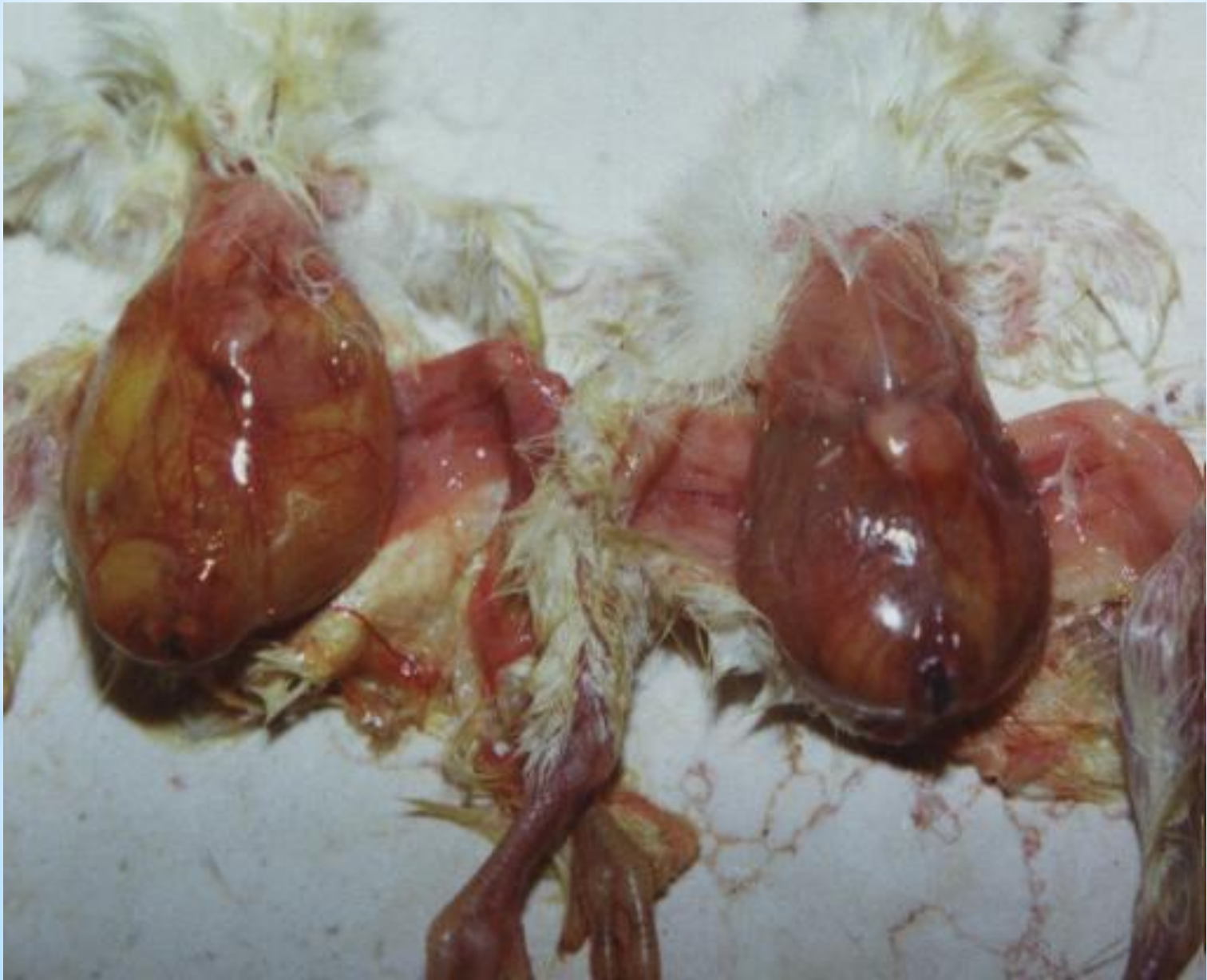
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* Typhlitis



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Diagnosis:

1. The clinical signs.
2. P.M. lesions in Pullorum disease are variable and not sufficiently characteristic to make a firm diagnosis.
3. Isolation and identification of *Salmonella spp.* from liver, spleen, intestine, or heart blood.

4. Diagnostic tests:

A. **The rapid whole-blood plate agglutination test.** This test depending on antigen blood reaction which completed within one minute .

*if the reaction occurs by fine, pin-point blue granules appear either throughout the mixture or only at the margins.

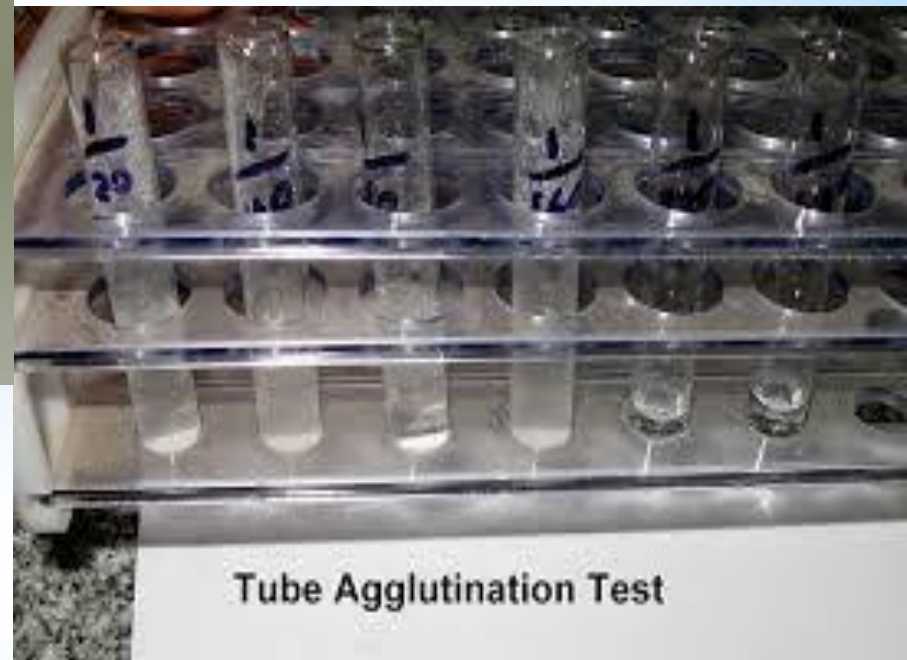
* Any reaction occurs between 1 and 2 min, must be considered doubtful and all reactions occurring after 2 min. must be considered negative.

B. **Tube agglutination test,** this test has the advantage of being quantitative, with a result expressed as a specific dilution and is a useful back-up check for the plate test.

5- ELISA.

The rapid whole-blood plateagglutination test.





Treatment:

1. Administering furazolidone or tetracycline in feed at 400 g/ton for two weeks.
2. Chloramphenicol 500 gm. / ton feed for 10-14 days.
3. Chlortetracycline 200 mg/kg B.W. IM.
4. An amino glycoside apramycin 150-225 mg/liter distal water.

Prevention:

1. Breeding stock and chicks should be purchased from suppliers and hatcheries certified free of *S. pullorum*.
2. Breeder flocks can be monitored using the rapid whole-blood plate agglutination test.
3. Strict biosecurity should be enforced to prevent introduction of the pathogen from flocks which serve as reservoirs.
4. Rodent eradication is an important component of control.

2- Fowl typhoid:

Definition:

An infectious egg transmitted disease of poultry caused by bacteria characterized by enlargement of the spleen , mahogany colored liver and diarrhea with pasting around the vent.

Synonyms:Typhoid

Etiology:

Salmonella gallinarum is a non-motile bacterium. The organism is sensitive to cold, sunlight, drying and disinfectants, but persists in soil. The cell wall antigens for this organism are identical to those of *Salmonella pullorum*, therefore infected flocks are detected by the *Pullorum* serological test.

Incubation period:

Normally 4 to 5 days, in acute phase of outbreak lasts 5 to 6 days but in the chronic phase lasts 3 to 5 weeks.

Susceptibility:

Chickens especially young adults 12 weeks and older. Turkeys Pheasant, Duck and Pea fowl become infected .

Transmission:

1. Primarily by through the egg from hen to chick.
2. Contaminated incubators, hatchers, chick boxes, houses, equipment, visitor and carrier birds.

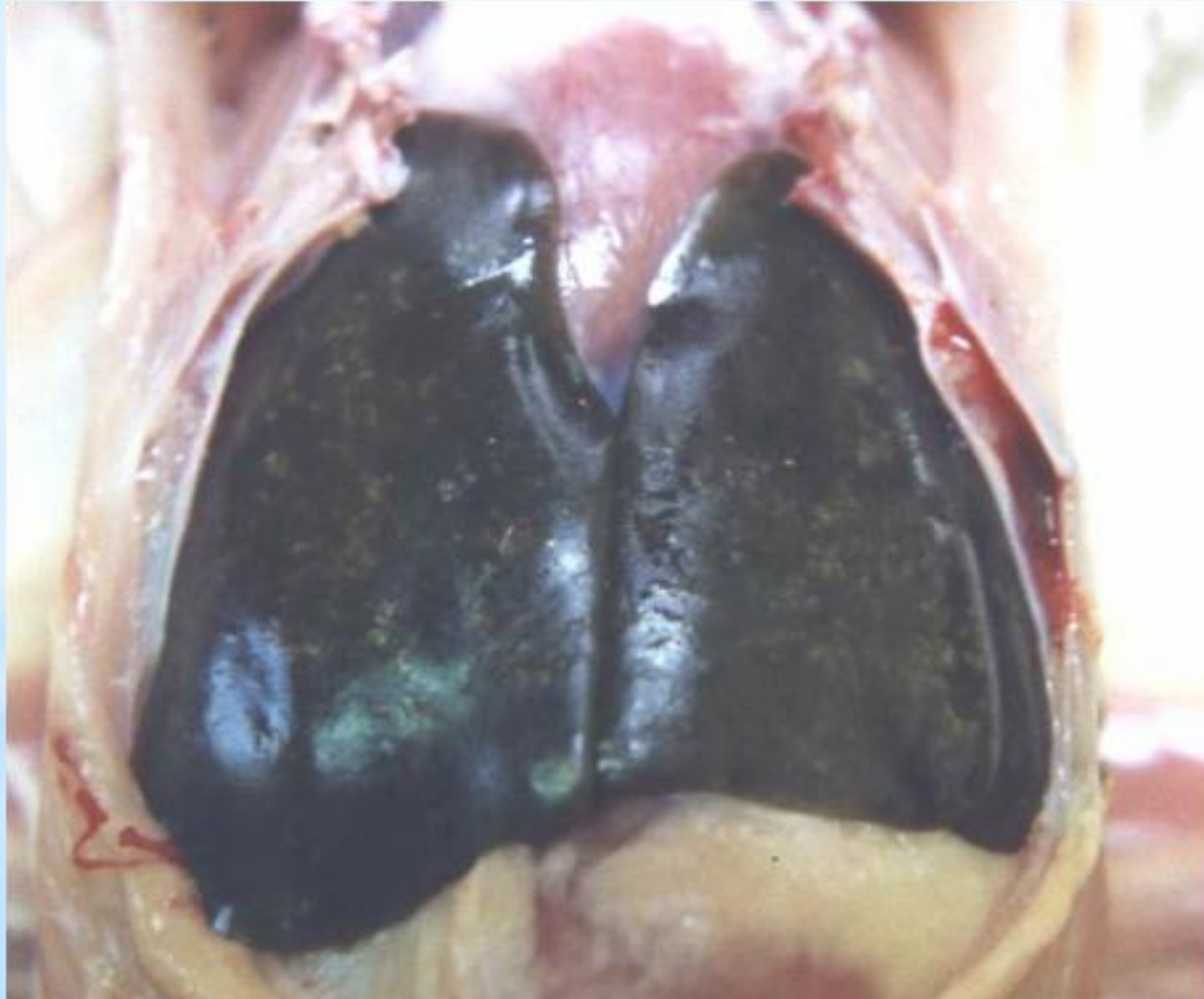
Clinical Signs:

1. Droopiness, ruffled feathers and loss of appetite.
2. Pale the comb and wattles.
3. An increased thirst.
4. Yellow-green diarrhea.

P.M. lesions:

1. Liver enlargement and mahogany colored (Metallic sheen).
2. Spleen enlarged and gall bladder distended.
3. Pinpoint necrosis of heart, liver and lung.
4. Pericarditis with turbid yellow fluid in the pericardial sac and fibrin attached to the surface of the heart.
5. Pinpoint hemorrhage in fat and muscle.
6. Enteritis and slimy (mucopurulent) inflammation of duodenum.
7. An anemia and leukocytosis occur in advanced stage.

* Liver enlargement and mahogany colored
(Metallic sheen).



* Pinpoint hemorrhage in fat and muscle



Diagnosis

Isolation and identification of *S. gallinarum* is required to confirm the diagnosis. The rapid whole blood plate agglutination test will demonstrate antibodies approximately 2 weeks after infection and can be used to screen flocks for reactors.

Treatment:

1. Administering furazolidone or tetracycline in feed at 400 g/ton, for two weeks.
2. Chloramphenicol 300 gm. / ton feed for 10-14 days.
3. Chlorotetracycline 200 mg/kg.
4. An amino glycoside apramycin 150-225 mg/liter distal water.

Prevention:

1. An administration of live **9R strain *S. gallinarum*** vaccine during the rearing period will eliminate outbreaks of clinical disease.
2. Controlled by eradication, not by medication breeder replacement birds must test negative for pullorum–typhoid before onset of production. If positive, the chickens are salvaged, cleaned and disinfected the flock.

*3-Paratyphoid:

Definition:

An acute or chronic disease which infected all birds and all ages caused by a large group of salmonellae. This disease characterized by diarrhea and present focal necrosis of visceral organs.

Etiology:

This disease occurs by large group of bacteria that are **non host-adapted**, more than 100 species and nearly 200 serotypes belonging to the genus salmonella .the most important types which caused this disease are : *Salmonella typhimurium* and *Salmonella enteritidis*.

Incubation period:

At 4 to 5 days and course of clinical signs is 3 to 5 weeks.

Susceptibility:

All domestic poultry (Chicken and Turkey), Wild birds, Sea fowl and Humans are susceptible hosts. Salmonella in people is associated with food poisoning outbreaks, therefore the Paratyphoid in poultry is of public health significance.

Transmission:

Egg shell contaminated, incubators, hatcheries, chick boxes, houses, equipment, visitors and carrier birds.

Clinical Signs:

- 1-Depression, drooping, chilling and weakness.
- 2-Pale vent and dullness.
- 3-Swelling of joints.
- 4-Acute outbreaks in young birds 7 to 21 days of age, with peak of mortality from 7 to 14 days of age depending on the virulence of the disease agent.

P.M. lesions:

1. Swollen liver, septicemia, emaciation and dehydration.
2. Retained yolk sac and enteritis with cheesy cecal core.
3. Necrotic foci on organs, congested of blood vessels and pale yellow mottled liver are common.

Diagnosis:

1. Isolation and identification of *Salmonella spp* from liver, spleen, intestine, or heart blood.
2. Routine microbiological screening of liver, spleen and intestinal pools from post mortem submissions to laboratories is strongly recommended.
3. Specific ELISA-based test kits are available for assaying for *S. enteritidis* antibody.

Treatment:

1. Administering furazolidone or tetracycline in feed at 400 g/ton, for two weeks.
2. Chloramphenicol 300 gm. / ton feed for 10-14 days.
3. Ampicillin 200-400 gm./100 liters distal water.
4. Streptomycin 50 – 100 gm./ kg B.W. IM.

Prevention:

- 1-Cleaning and disinfecting all equipments in the flock.
- 2-Separated the older from the young stock.
- 3-The poultry house must be screened against wild bird.
- 4-Avoid contaminated the feeders and waterier by faeces.
- 5-Good absorbent type of litter should be used in poultry flocks.
- 6-Diagnosis should be sought immediately an outbreak of disease occur.
- 7-Hatching eggs should be collected in cleaned and disinfected containers.
- 8-Dirty eggs should not be used in hatchers.
- 9-Set only clean eggs- wash and sanitize or fumigate all eggs before incubation.
- 10- Sanitize the hatchery.
- 11-Don't mix eggs or chicks from different flocks.
12. don't mix birds of different age and species in same flock.