

Infectious coryza (IC)

Haemophilus paragallinarum
infection

Fowl coryza

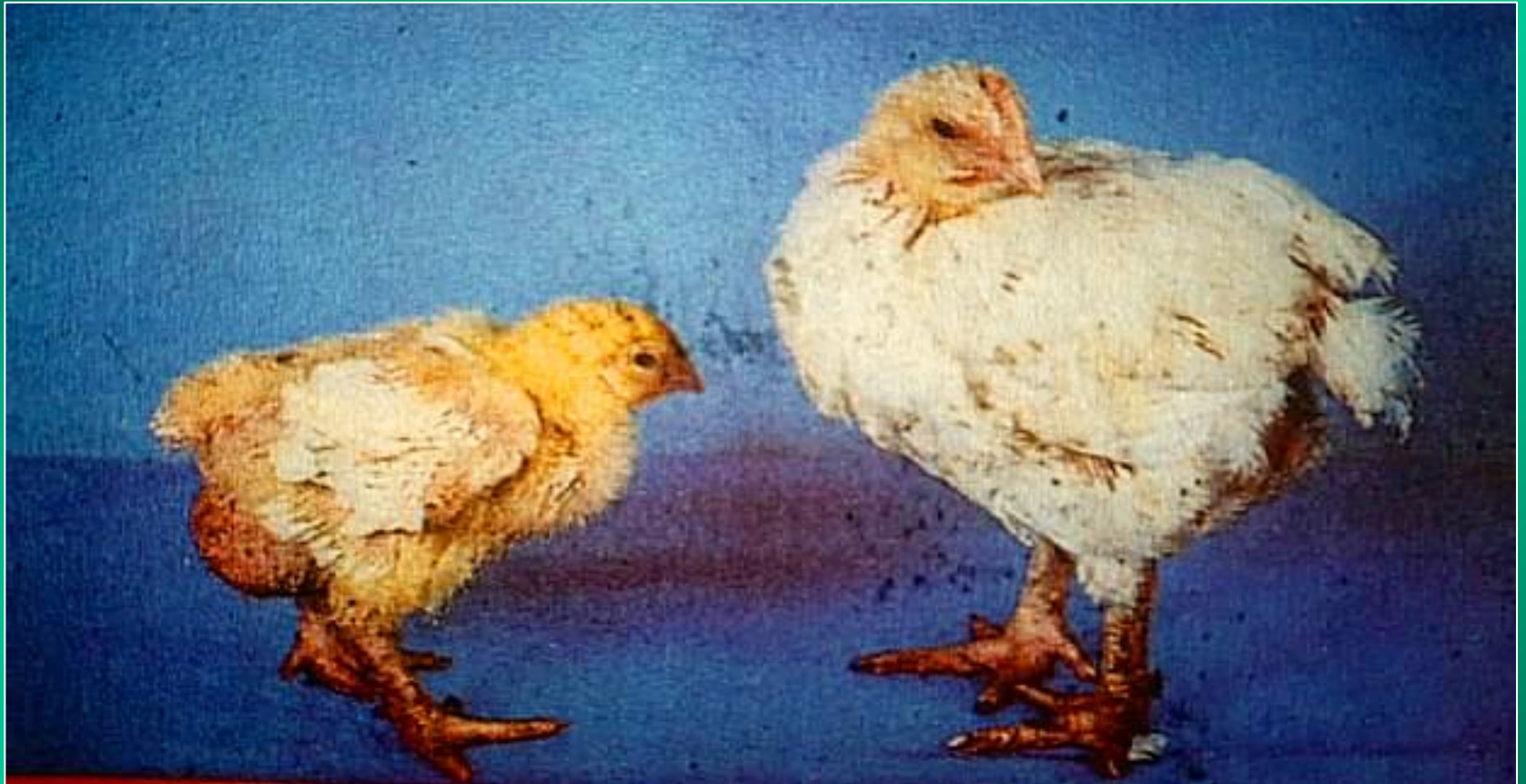
It is a highly contagious acute or sub acute rapidly spreading disease of upper respiratory tract of chickens,

characterized by conjunctivitis, oculo-nasal discharge, sneezing, swelling of the infraorbital sinuses, swelling of the face, swollen wattle, growth retardation, reduced egg production, and some times by infection of the lower respiratory tract.



Economic importance:

- 1-I.coryza can turn into a chronic respiratory disease.
- 2-Inferior food conversion in broilers with an increased number of culls (Stunted birds- air sacculitis).
- 3-Poor growth performance in growing birds.
- 4-A marked reduction from 10- to more than 40% in egg production in layers and persists for at least 1 month.



Etiology:

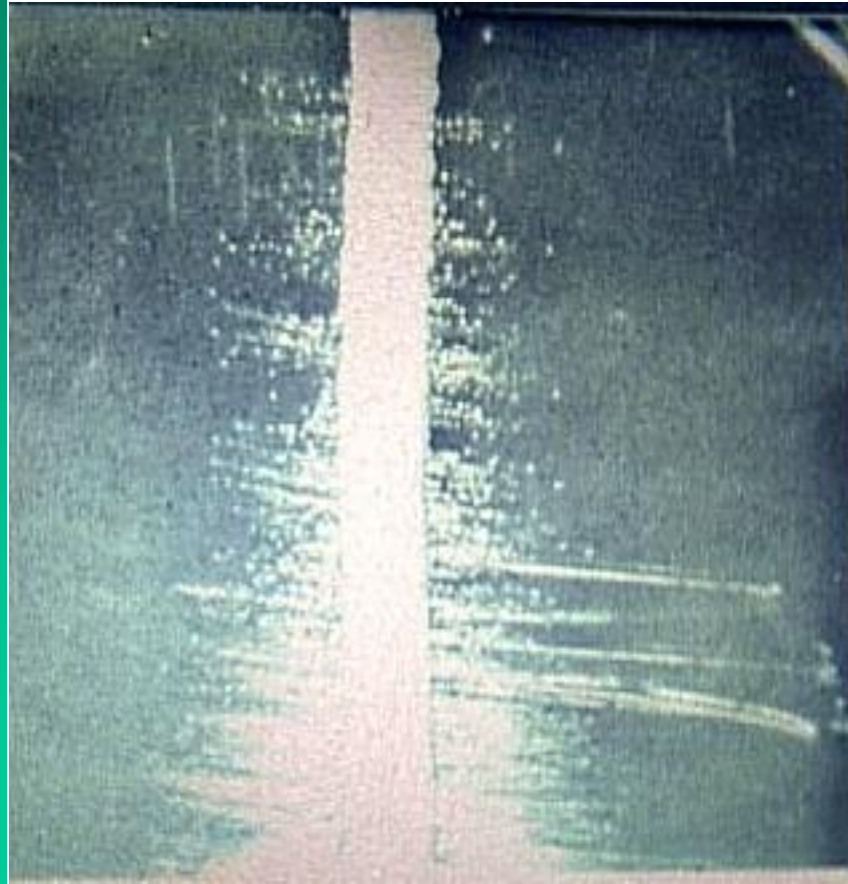
Haemophilus paragallinarum (HP).

- It is a small gram-negative, aerobic, non-motile, non spore forming, bipolar staining and capsulated bacterium. It appears as short rods or coccobacilli.
- The organism requires V-factor (Nicotinamide adenine dinucleotide-NAD) for growth in enriched artificial media. A number of bacterial species excrete V-factor (Staph epidermidis, Staph aureus). Cultures of HP appear adjacent or next to the feeder culture (Satellite phenomenon).

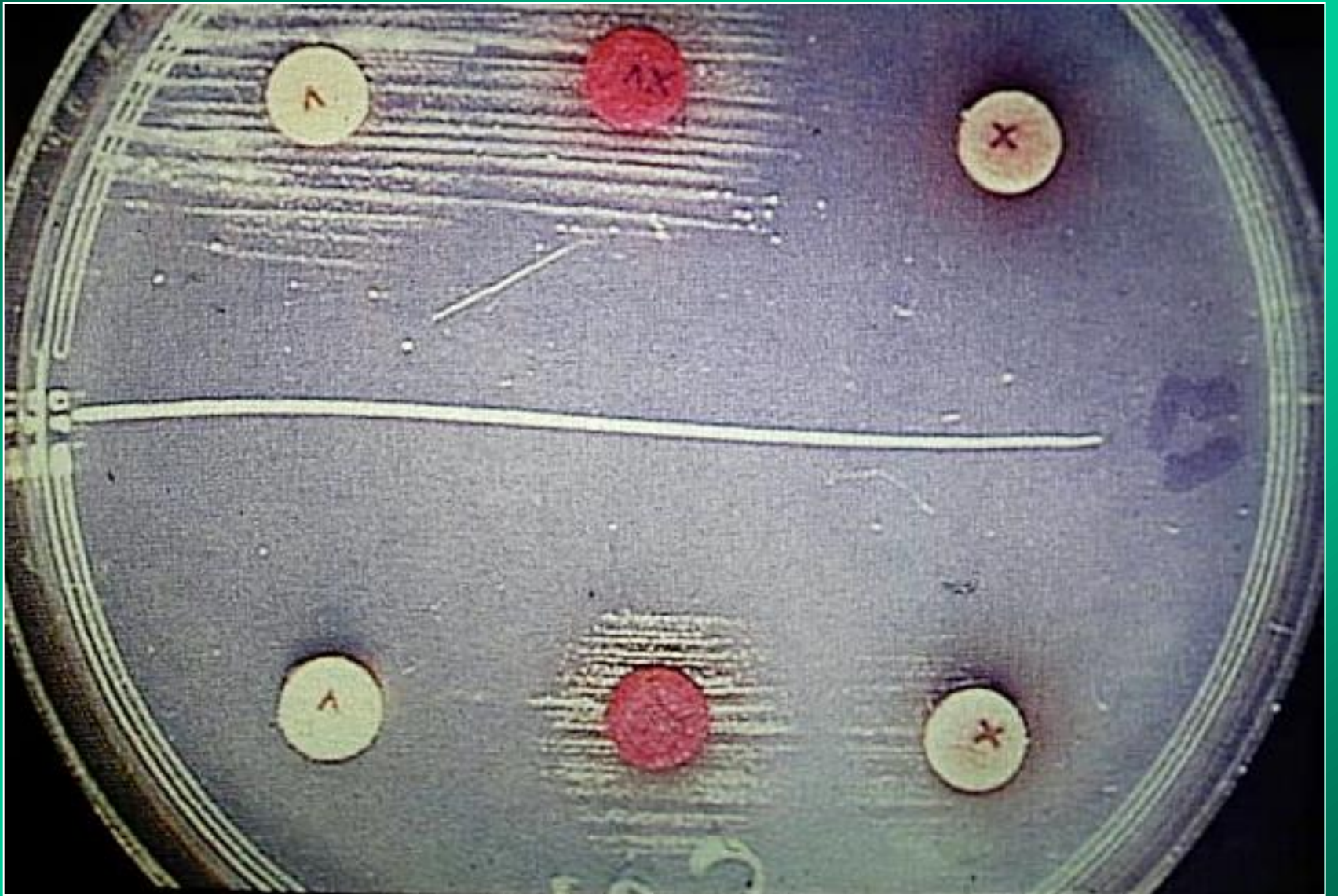


-Blood agar to which supplements are added is used for the isolation of HP. The organism is grown at 37°C-38°C in an atmosphere of high humidity, 5% CO₂ or under reduced O₂ tension (microaerophilic environment). Use candle jar if CO₂ incubators are not available.

-On Blood agar colonies of HP are tiny small up to 0.3-1 mm in diameter, dew drop-like, non-hemolytic.



Satellite phenomenon. Tiny dewdrop colonies of HP growing adjacent to staph.culture (broad streak) on blood agar plate



Antigenic structure and strain classification:

-3 antigenic types (A, B, and C) have been defined by plate agglutination and hemagglutination typing using known

antisera.

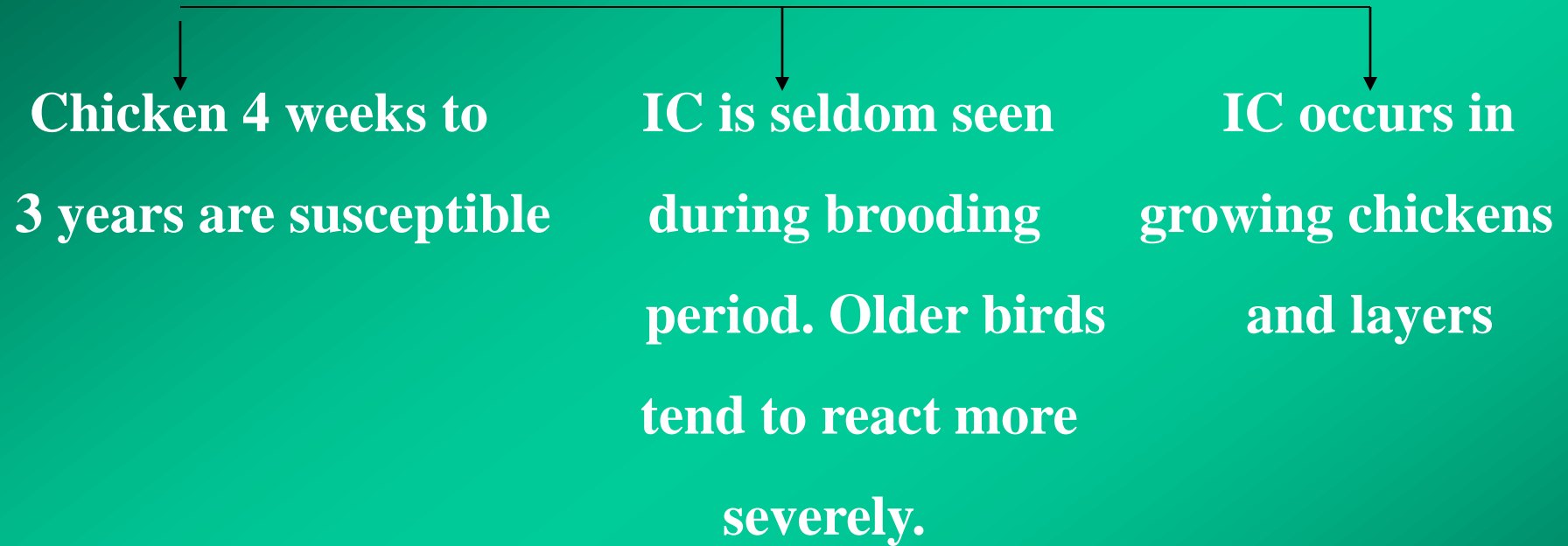
-All types share certain antigens (Common antigenic components exist) and are utilized in the examination of sera for antibodies by agglutination tests.

Virulence: variation from very low to high virulence occurs.

Resistance to chemical and physical agents: HP is a delicate bacterium that does not survive for more than 5hrs outside of birds. It is easily destroyed by many disinfectants.

Susceptibility:

chickens



-Chickens 14 weeks of age and older are most susceptible.

-*I. Coryza* has been reported in Pheasants, Guinea fowl and Quails

Complicating factors and stresses:

Intercurrent infection with other pathogens such as viruses of Pox, I.B, ILT, ND and bacteria such as Mycoplasma, P.multiocida, E.coli plus cold, wet conditions, over crowding, parasitism, inadequate nutrition, and Vit.A def, and others are factors that predispose to more severe and prolonged disease.

Mode of infection and transmission: -

-The main sources of disease spread are: -

1) Clinically affected birds.

2) Carrier birds.(recovered birds remain carriers and shedders for life)

-Transmission occurs by: -

1) Inhalation (Air-borne disease)

2) Through ingestion.

The disease spreads from bird to bird and flock to flock by:

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- 1) direct bird to bird Contact.
- 2) inhalation of infectious aerosols coughed into the air.
- 3) ingestion of Contaminated feed and water.
- 4) mechanically throw contaminated Equipment and personnel.

Incubation period: -

1 to 3 or 4 days.

the course of the disease is 4 to 12 weeks

Clinical signs: -

-the severity of infection varies depending on:

the age, breed, environmental stress and presence of concurrent infections.

1- in the mild form

seen in young chickens,

birds become depressed and have nasal discharge and mild swelling of the face.

2- in the sever form

seen in young adults, there is an acute infection of the upper respiratory tract.

Clinical signs: -

- Usually there is a rapid onset, depression, serous to mucoid nasal discharge that become thick and purulent of very offensive odor, conjunctivitis "red eye", lacrimation, in some cases the eyes are partially or completely closed, sneezing, swollen face, swollen wattles, and swollen infra orbital sinuses.
- Rales (Resp. noises), difficult breathing and coughing are indicative of lower resp. tract involvement (trachea, airsacs).
- Birds may have diarrhoea, and feed and water intake is usually reduced leading to loss of weight and in growing birds, this means an increased number of culls (stunted birds), and in laying flocks this means a drop in egg production (10-40%).

- A very offensive odor may be detected in flocks especially when the disease has been become chronic and complicated with other bacteria.
- All the susceptible birds will show signs within 7-10 days.
- IC is characterized by high morbidity and low mortality if not complicated by other infections. Mortality is very low (1%) and the course of the disease is not more than about 10 days in the mild form and approximately 3 weeks in the more severe form.
- IC is usually more severe and prolonged 1-2 ms or more with resulting increased mortality rate (10-50%) with picture of chronic resp. disease when complicated with other agents or when the birds are exposed to stress factors.
- Recovered birds are frequently carriers.











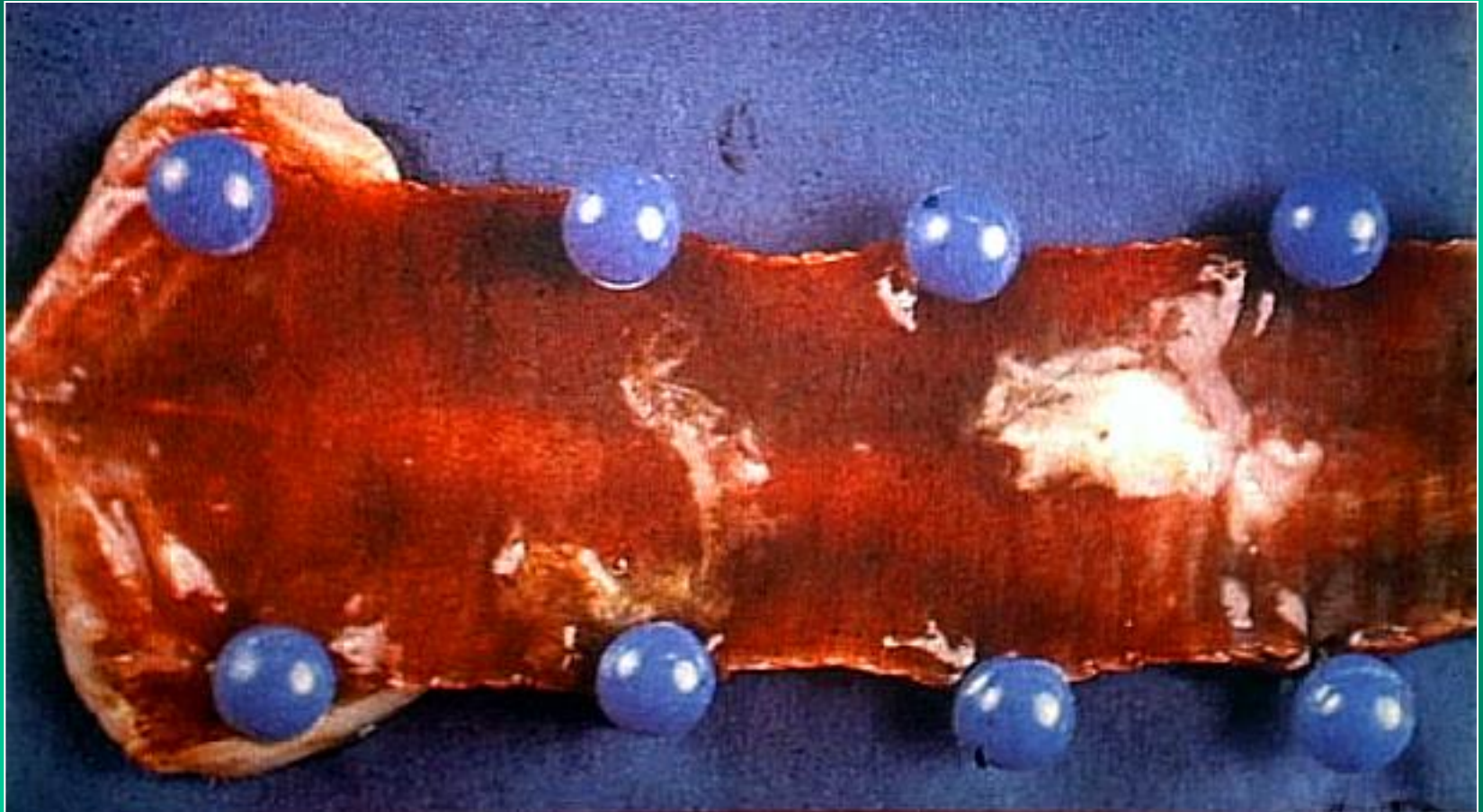
Lesions: -

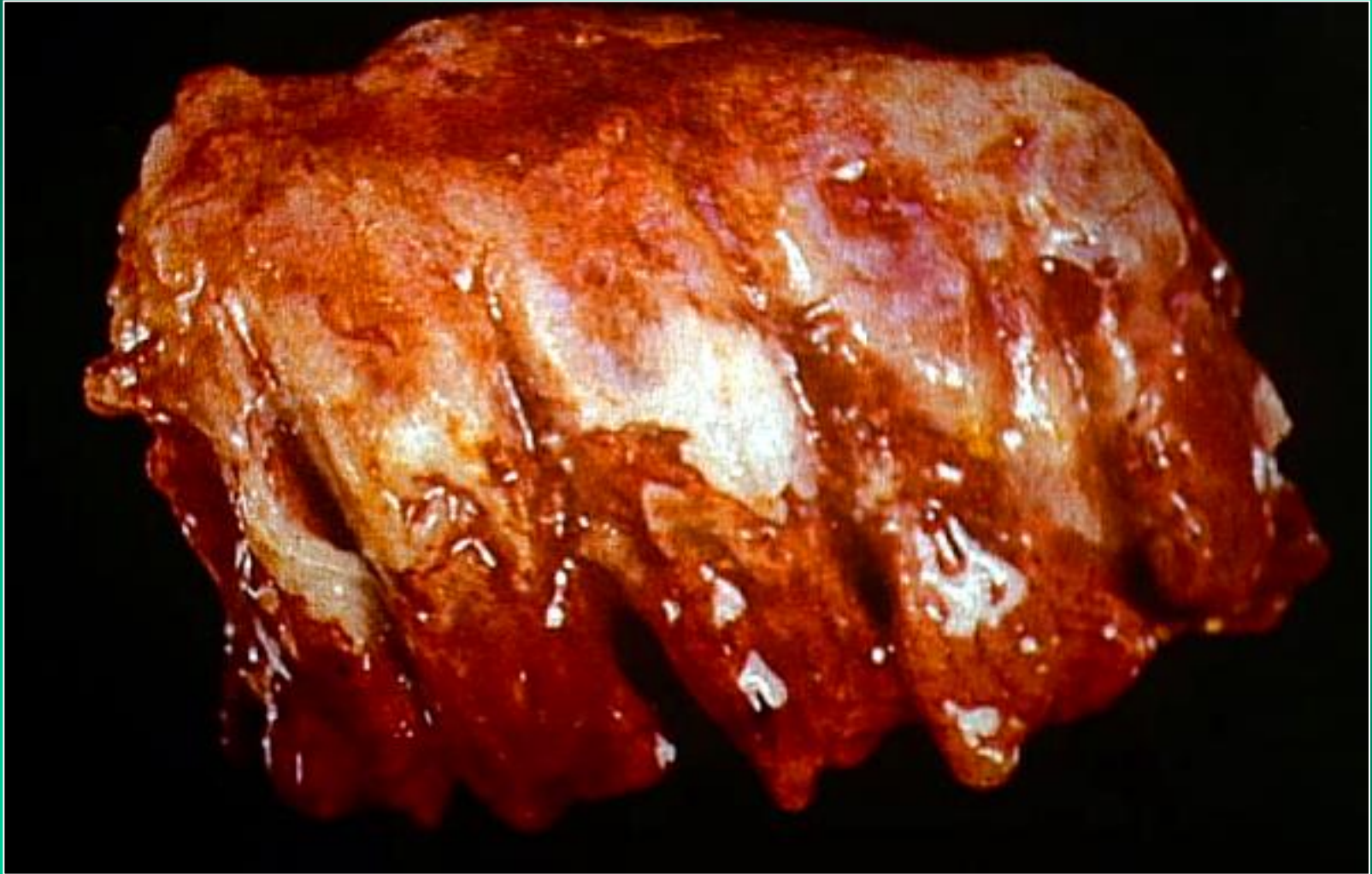
In uncomplicated cases: *H. paragallinarum* produces:

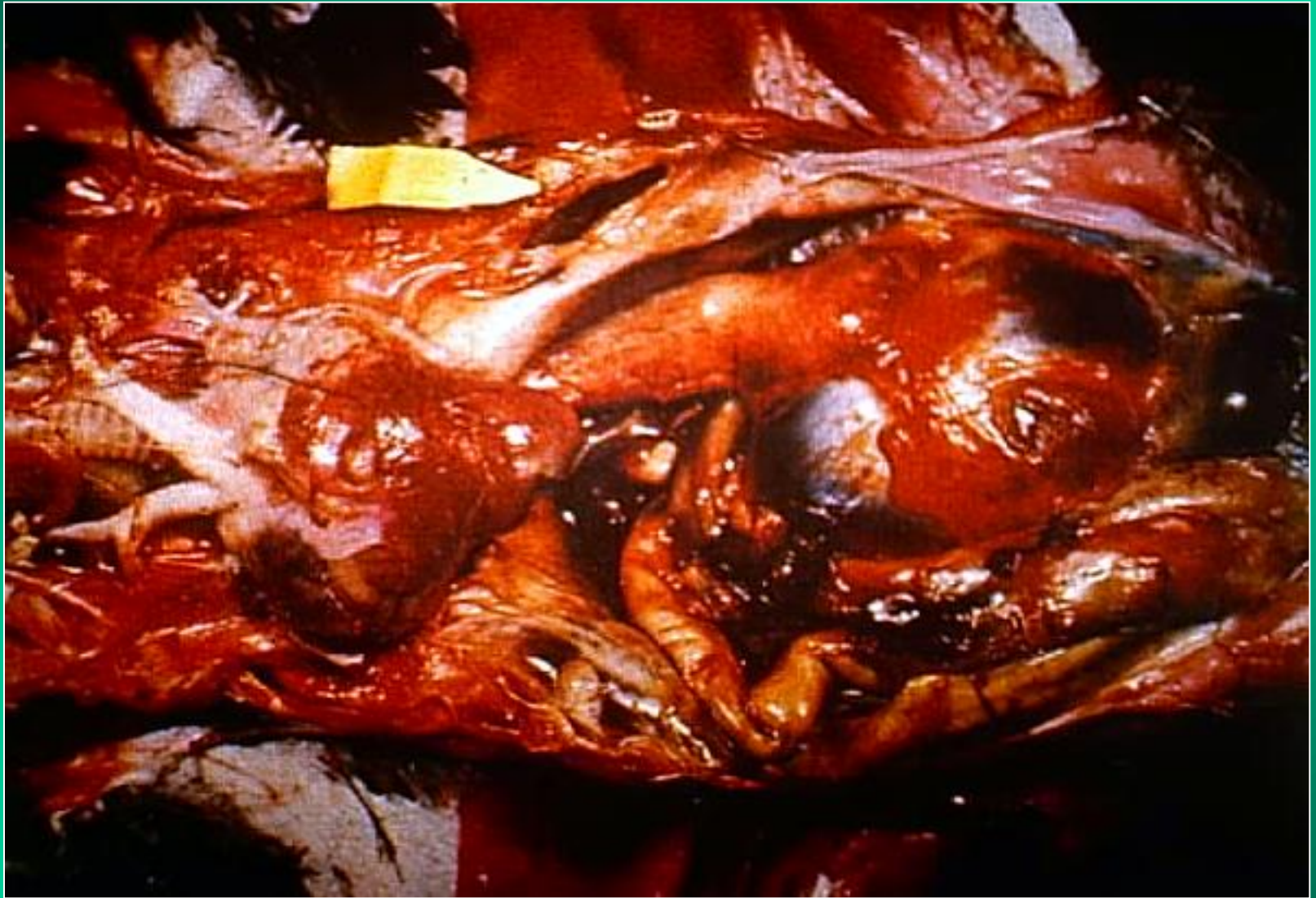
- 1) Acute catarrhal inflammation of the mucous ms of the nasal passages and infraorbital sinuses (distended with serous or mucous exudates).
- 2) Catarrhal conjunctivitis. Eyelids may stick together.
- 3) S/C oedema of the face and wattles (swollen face and wattles).
- 4) Typically pneumonia or air-sacculitis is rarely present.

In complicated cases:(chronic inflammatory process)

A mucopurulent or caseous exudates is present in the sinuses, nasal passages and conjunctival sac, catarrhal tracheitis, pneumonia or air sacculitis.







Diagnosis: -

I-History of a rapidly spreading disease.

II-Signs and lesions are suggestive.

III-Demonstration of the organism.

-A smear of nasal exudates or sinus exudates should be made and gram stained, it should reveal Gram -ve bipolar staining rods.

IV- Isolation and identification of the organism, this is usually done by:

Swabbing from the infraorbital sinus, trachea or airsac in the acute stage of the of the disease (1-7 days post infection) onto blood agar plates containing NAD or cross streaked with a feeder organism

-Culture plates are incubated at 37C in a candle jar (large screw cap jar in which a candle is allowed to burn out) or in an atmosphere of 5% CO₂ (CO₂ incubator) for 24-48hr

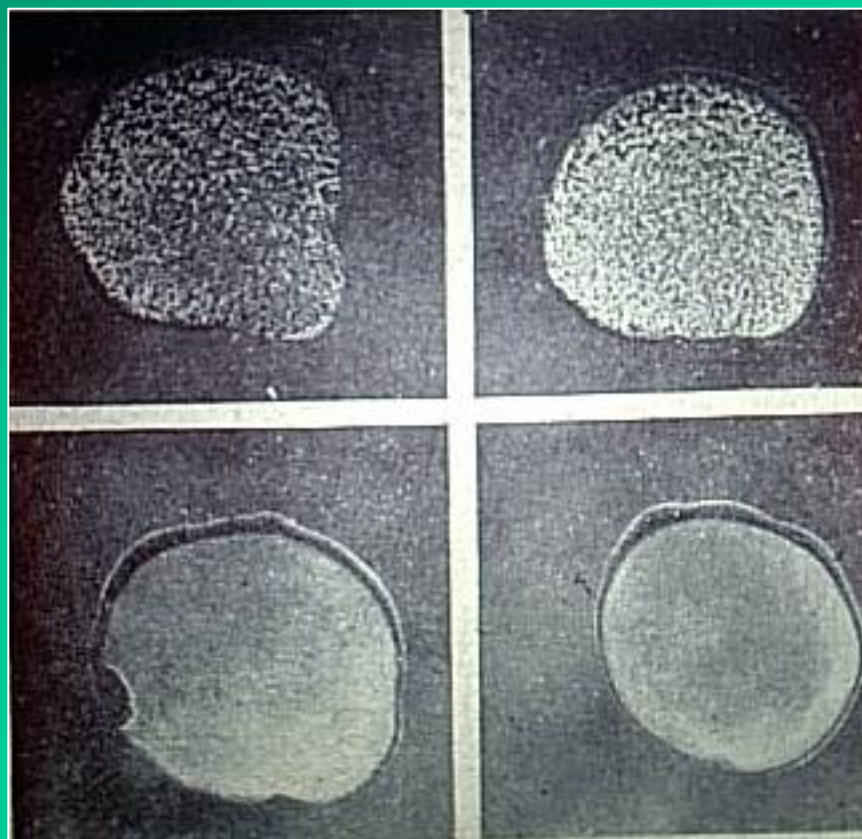
Identification: -

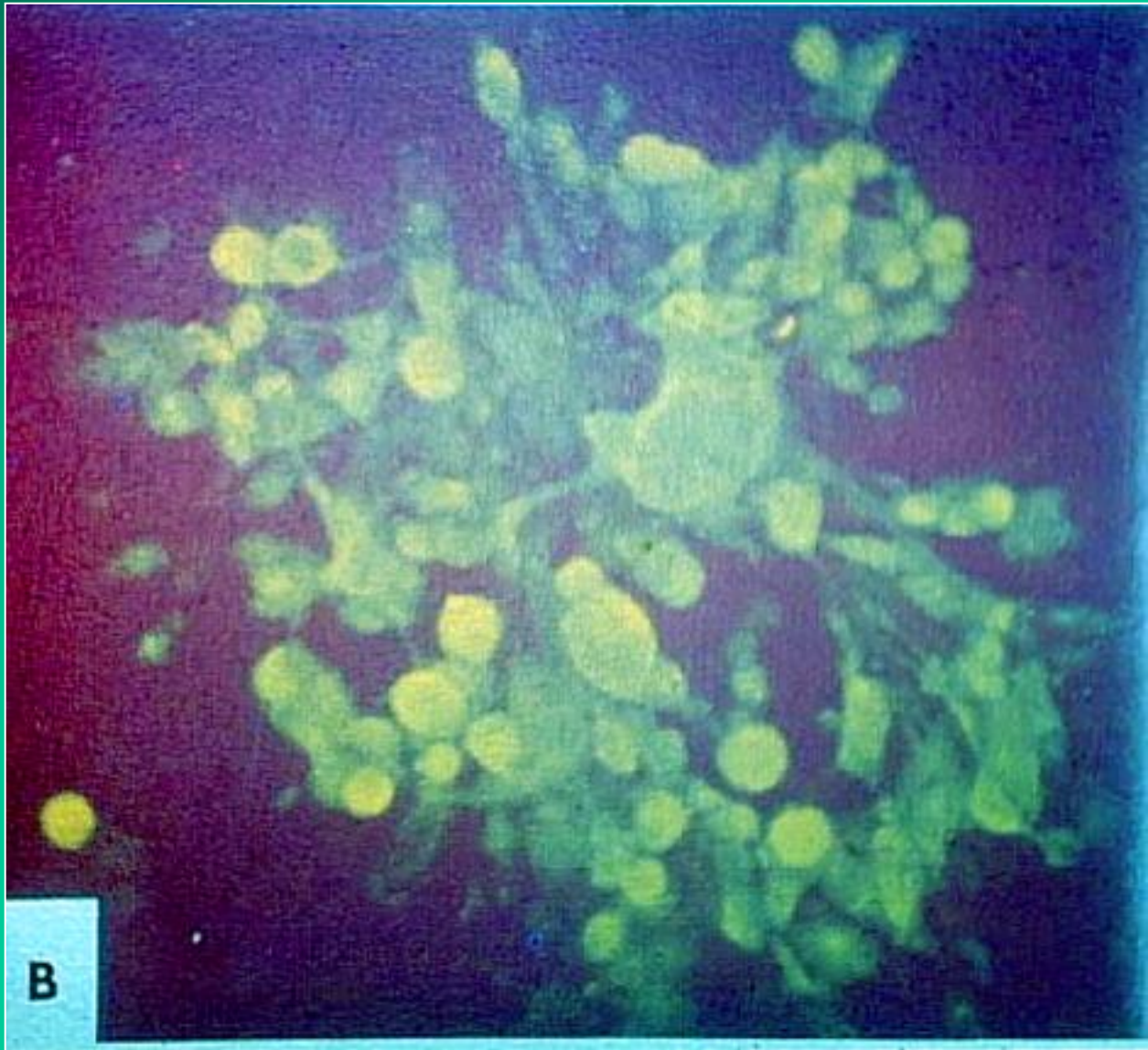
1) **Colonial morphology:** colonies appear as tiny very small 0.3-1 mm, translucent, dewdrop like. When a feeder organism is used, colonies of HP appear adjacent or next to the feeder colonies → (satellitic growth).

2) **Cellular morphology:** Gram -ve, non-motile, polar staining. ...etc

4) Serological identification: To identify the serotypes of the organism by the use of known antisera with the aid of the tube aggl. Test, plate aggl. Test, agar gel precipitin test. The organism can be identified by immunofluorescent technique by staining colony imprints with fluorescein-labeled antisera.

5) A polymerase chain reaction (PCR) test can be applied either to suspect colonies or directly to samples from chickens.





V- Bird inoculation:

Reproducing of the disease: Inoculate sinus exudates or culture of the organism into the infraorbital sinus or in the nostrils of chickens 4 wks. If HP is present in the inoculum, the clinical signs are observed in 1-2 days up to 6 days.

VI- Response to sulfathiazol treatment:

-If disease responded well to this drug, it was felt it was sure to be IC.

VII- Serological testing:

-PAT, TAT, AGPT, HI, FAT, and ELISA can be used to detect HP antibodies in serum → 7-14 days post-infection to check flocks for evidence of past infection.

Prevention:

I-Good management and sanitation: should be considered to prevent the introduction of infection including:

a-Allow good ventilation.

b-Avoidance of stress factor.

c-Control of complicating factors (other pathogens).

d-An all in, all out prevention program is the best way for avoiding this disease.

e-Avoiding carrier stock, the introduction of new stock should be limited to 1 day old chick, or older birds which are known to be free from infection, such birds should be reared so that there is no direct or indirect contact with other chickens.

f-Cleaning and disinfection of building after one flock of birds

have left and before others are housed and good hygienic prevention should be applied

II- Vaccination: This is only applied in endemic areas. IC bacterins (*Coryza* vaccine, IC inactivated vaccine) can be used to immunize chickens in areas where the diseases are endemic.

IC bacterins may be autogenous (prepared specifically from the flock with the organism isolated from it) or may contain one serotype (Monovalent) or 2 types (bivalent), 3 types (Poly-valent).

Field vaccination protocol and regimes:

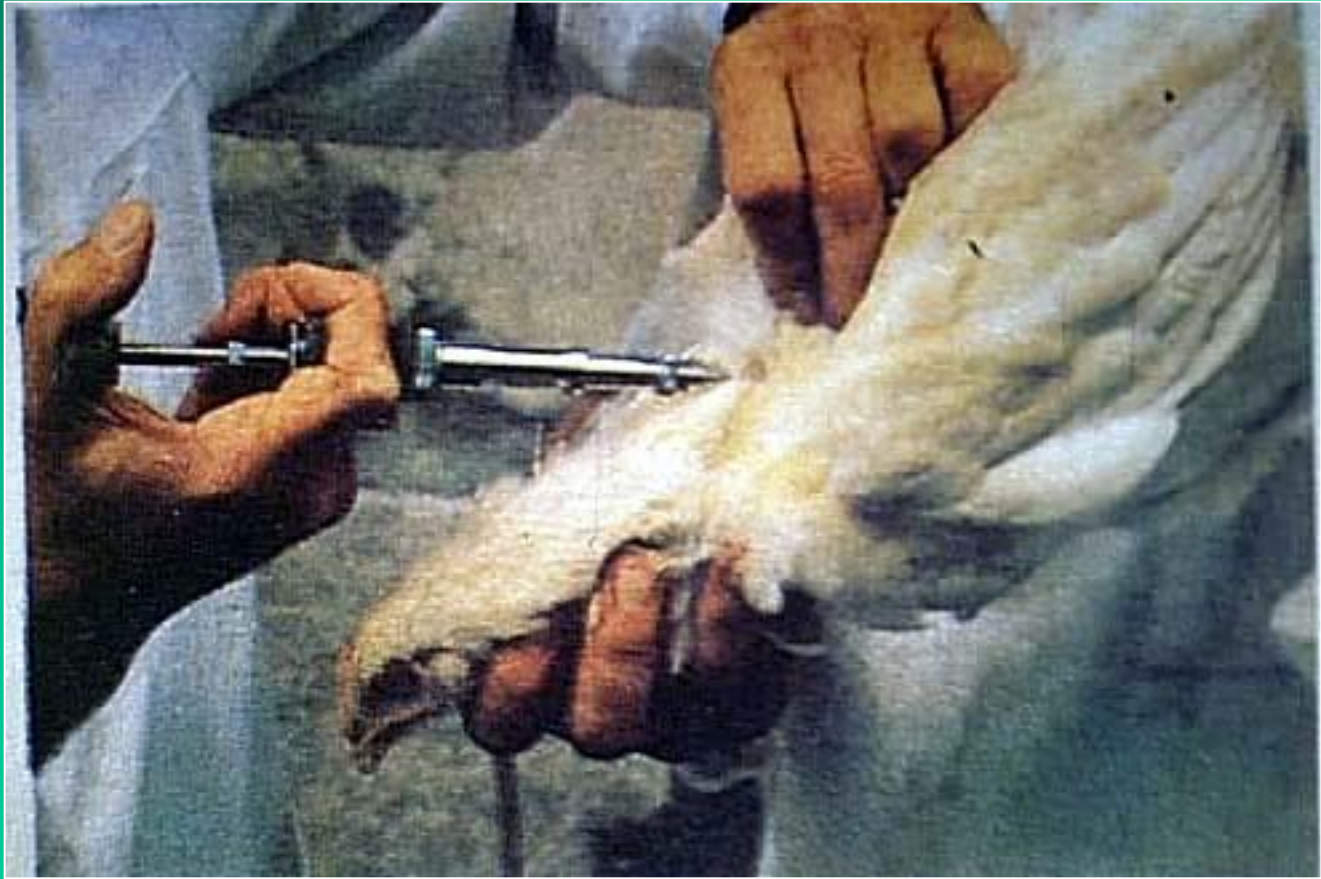
1- inactivated vaccine:

A- oil emulsion vaccine

B- aluminum hydroxid vaccine

Bacterins are injected S/C (under the skin) on back of neck or I/M (leg muscle) in chickens between 10-20 wks of age. All birds should receive two injections of the bacterin at 3-4 wks intervals before 20 wks of age, Example (vaccinate each chicken 2 times starting at 10 wks of age, then at 13 or 14 wks of age).

Dose: follow the instructions of the producer.



Immunity period: 9 months.

Live vaccines: Vaccines involving live HP organisms are said to stimulate a more protective response but will give rise to carriers and may produce disease.

Control and treatment: (If you have an outbreak)

I-Apply strict sanitation and sound management to prevent the spread of infection:

- Properly dispose of dead birds by incineration, cleaning and disinfection of houses after the occurrence of an outbreak.
- vaccinate all replacement flocks at least 3 weeks before housing.
- During an outbreak add potassium permanganate or iodophor 1:10000 in D.W.
- control requires attention to flock sanitation and biosecurity
- remove manure and clean house, control rodent, flies

II- Treatment:

Various sulfonamide and antibiotics are used in alleviating the severity and course of IC.

A-Sulfa Drugs

- **Sulfathiazol:** is the drug of choice, dose for birds under 14 wk is 0.5% in feed for days), it can be used also in water at a rate of 1-1.5 gm/ liter for 5 -7 days.
- **Sulfadimethoxine:** 2-3 gm initial dose per liter water for the first day and subsequent dose up to 4-6 gm/L.W. for 3-5 days.
- Sulfadimidine:** 1-2 gm/L.W for 3-5 days.

- Sulfadimidine Sol. 33.5%: 3ml/L.W (3 days treatment, 2 days rest, treat again 2 days)
- Sulfaquinoxaline 20%: 1.5-2.5gm/L.W for 3 days, withdrawal for 2 days and administered again for 3 days.
- Sulfadiazine+trimethoprim: 1gm/5lieter for 5 days.
- Trisulfa(Sulfamethoxanie, sulfathiazol, sulfamerazine): 3 Kg/ ton feed for 4-5 days.
- Drugs in combination: Found effective include (Sulfachloropyrazine+S.dimidine, S.dimethoxaine+Chlorte trcy-cline, and S.dimethoxaine+trimethoprim).

N.B. → Very important

- The sulfa drugs are not approved for chickens older than 14 weeks or for commercial layer hens.

B) Antibiotics:

- Erythromycin: 1 gm/Liter for 3-5 days, 40-50 mg/bird by injection.
- Terramycin: 1gm/liter for 3-5 days up to 7 days.
- Lincospectin inj. 20-30 mg/Kg B.W for 3 days.
- Streptomycin inj 100-200 mg/ bird for 3-5 days.

- Terramycin long acting inj: 40-50-mg/ birds S/C.
- Ampicillin or Amoxycillin: 0.5-1.5-gm/Liter water for 3-5 days.
- Aureomycin: 10-20 mg / bird for 5-10 days in water.
- Spectam: 20 mg/Kg B.W. for 3-5 days in water
- Flumiquin: 12 mg/Kg B.W. in water for 3-5 days
- Recently the new second generation **quinolone** derivatives that inhibits bacterial replication are used for IC treatment including:

- i- Enrofloxacin (Baytril, Cidotril, Spectramavit): at a rate of 10 mg/ Kg B.W. for 3-5 days.
- ii- Danofloxacin (Advocin): 5 mg/Kg B.W for 3 days in water.
- iii- Norfloxacin (Norotril): 12 mg/Kg B.W for 3-5 days
During treatment give vit. A. After treatment give diuretics (nephryle, hexavit, nephrotonic, Etc).

COOH

Enrofloxacin

ACTIVITY SPECTRUM AND
ANTIMICROBIAL ACTIVITY:-

- 1- Mycoplasma.
- 2- Salmonella.
- 3- E. Coli.
- 4- Haemophilus.
- 5- Pasteurella.
- 6- Spirochaeta.
- 7- Staph.
- 8- Strept.
- 9- Klebsiella.
- 10- Rickettsia.
- 11- Chlamydia.
- 12- Erysipelas

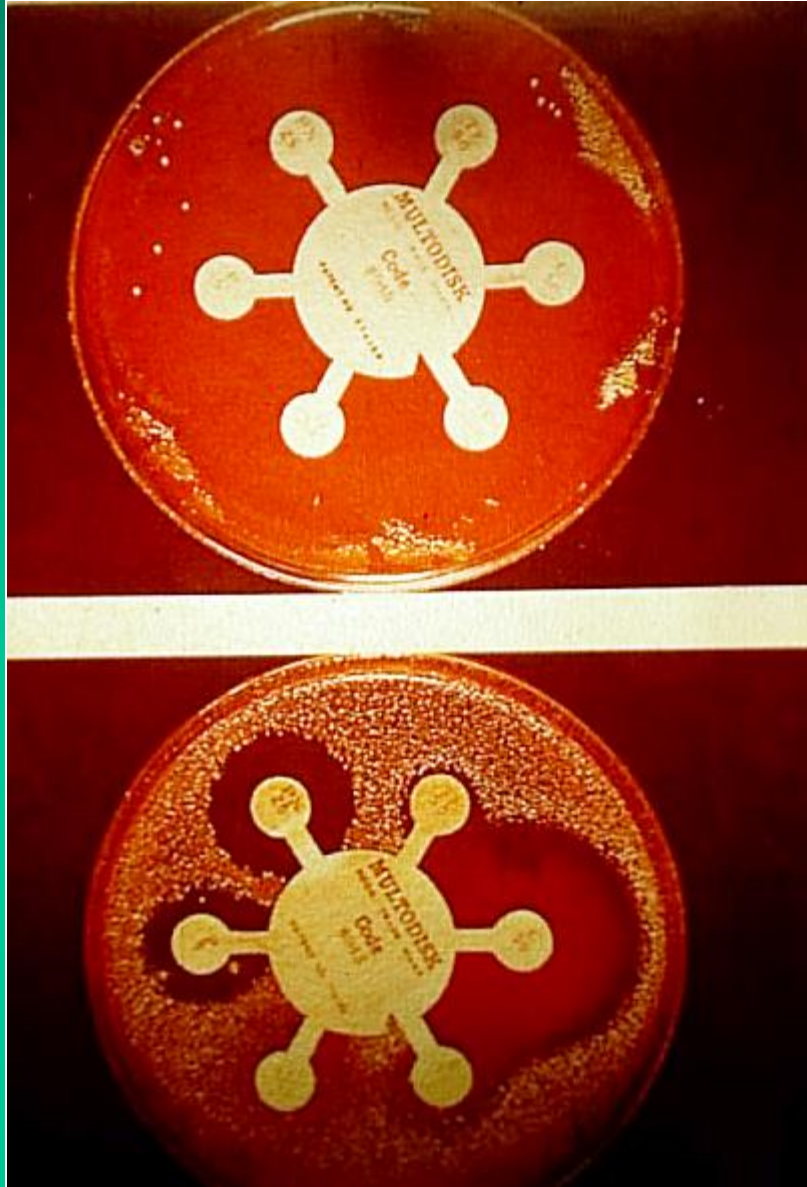
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N.B.

-No drugs have been found to prevent production of carriers and signs reappear after treatment (Drug resistant does develop). If condition reoccurs, retreat. The performance of antimicrobial sensitivity test is recommended.

- Control can not be accomplished with drug alone. Management is equally important.



III- Eradication:

Eradication method is applied in non-endemic area to eliminate the agent from the farm by the removal of infected or recovered birds and the thorough cleaning, disinfection and resting of building for at least 2-3 weeks before restocking with clean birds.