

# Colibacillosis

Extended Version

**Classic cases:** Swollen, dying, recently weaned piglets. Down calf with diarrhea.

**Presentation:** Affects pigs (2 forms), ruminants, and poultry

## PIGS #1 Edema disease, gut edema, or bowel edema

- Signalment
  - **Healthy**, well-conditioned, 1-2 weeks after weaning
  - Occasionally nursing or adult pigs
  - **High-protein diet**
  - Risk factors: weaning, mixing pigs, changes in diet, loss of milk antibodies from intestine
- Clinical signs
  - Peracute death
  - CNS involvement (ataxia, paralysis, recumbency)
  - Periocular edema (click link to see image)
  - Swelling of forehead and submandibular region
  - Dyspnea, characteristic squeal due to laryngeal edema
  - Anorexia

## PIGS #2 Enteric colibacillosis

- Signalment
  - Nursing and weanling pigs
- Clinical signs
  - Profuse watery diarrhea
  - Rapid dehydration, acidosis, death

## Colisepticemia of calves and lambs

- Signalment
  - Calves **less than 1 week old**
  - More common in dairy than beef calves
- Clinical signs **“Down with diarrhea”**
  - Septic shock (listlessness, lack of interest in nursing, depression)
  - Collapse, recumbency, coma
  - Loose, mucoid feces – usually not severe diarrhea
  - Terminal leukopenia is marked



*Nursing and recently weaned piglets are at highest risk of disease due to E. coli*

*Image courtesy of woodleywonderworks*

## Poultry colibacillosis

- Acute fatal septicemia
- Subacute **pericarditis** and airsacculitis

## **DDX:**

**Edema disease:** *Strep suis* type 2 meningitis, African swine fever, classical swine fever, hog cholera, clostridial diseases,

**Enteric colibacillosis:** Transmissible gastroenteritis, coccidiosis, rotavirus enteritis, porcine epidemic diarrhea, *Clostridium perfringens* types A and B, salmonellosis

**Colisepticemia:** rotavirus, coronavirus, cryptosporidiosis, salmonellosis

**Poultry colibacillosis:** Salmonellosis, mycoplasmosis, infectious bronchitis, Newcastle disease, hemorrhagic enteritis

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## Tests of choice:

### PIGS #1 Edema disease

- Clinical and necropsy findings
  - Subcutaneous edema
  - Edema in gastric submucosa – esp glandular cardiac region
  - Stomach full of dry feed
- Culture, PCR

### PIGS #2 Enteric colibacillosis of pigs

- Clinical and necropsy findings
  - Dehydration and distention of the small intestine with yellowish, slightly mucoid fluid
  - Reddening of fundic portion of gastric mucosa
- Normal villi length with adhered small bacterial rods
- Immunofluorescence
- Isolation of organism

### Colisepticemia of calves and lambs

- History and clinical findings
- IgG deficiency
- Demonstration of organism in blood or tissues

### Poultry colibacillosis

- Non-specific lesions – enlarged, hyperemic liver and spleen, fluid in body cavities
- Culture

## Rx of choice:

Edema disease: ineffective

Enteric colibacillosis

- Antibiotics and supportive care

Colisepticemia of calves and lambs

- Aggressive bactericidal antibiotics and supportive care for septic shock

Poultry colibacillosis:

- Treat early with antibiotics
- Most strains are resistant to tetracyclines, streptomycin, and sulfa drugs

## Prognosis:

Edema disease: Very poor

Enteric colibacillosis: Poor

Colisepticemia of calves and lambs: Very poor

Poultry colibacillosis: Poor

## Prevention:

PIGS #1 Edema disease:

- Oral antibiotics in drinking water in herd where disease is detected
- Control is difficult



*"Down with diarrhea"- Colibacillosis in a calf.*

*Image courtesy of Dr. Lisle George*

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## PIGS #2 Enteric colibacillosis

- Reduction of dampness and chilling
- Improved sanitation
- Wire mesh flooring
- Vaccination of gestating sows with pilus-specific vaccines
- Pigs lacking receptors for K88 are resistant to the K88 strain

## Colisepticemia of calves and lambs

- Ensure early and adequate intake of colostrum

## Poultry colibacillosis

- Improve air quality
- Control predisposing infections (mycoplasmosis, infectious bronchitis, Newcastle disease, hemorrhagic enteritis)

## Pearls:

### Edema disease

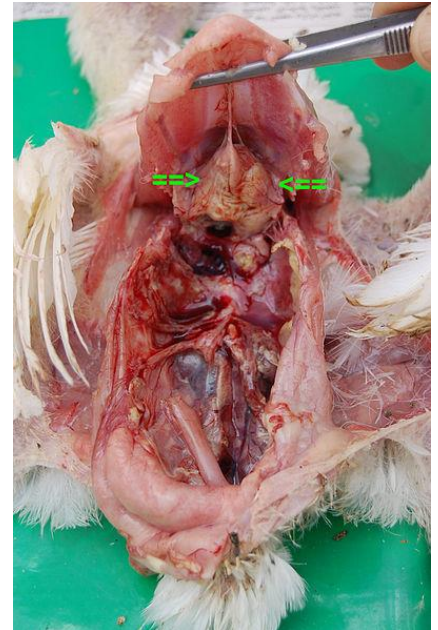
- Hemolytic *E coli*
- F18 pili and Shiga toxin 2e (Stx2e)
- Some pigs carry a specific mutation required for expression of the F18 receptors and are thereby resistant to infection.

### Enteric colibacillosis

- Enterotoxigenic *E coli*
- K88 and 987P strains in neonates
- K88 in postweaning piglet

### Poultry colibacillosis

- Usually non-hemolytic strains of *E coli*



Colibacillosis in a chicken.

**Note pericarditis.**

Image courtesy of Dr. L Mahin

**Refs:** Handbook of Pig Medicine, Jackson PG, pp. 91-95; Mayhew, Large Animal Neurology 2<sup>nd</sup> ed, pp 345-346; and Merck Manual, 10<sup>th</sup> ed (online): Edema Disease, Colisepticemia, Enteric Colibacillosis in Pigs, Colibacillosis in Poultry

## My Notes: