



Gastrointestinal disorders of backyard poultry

– Part 1 of 2

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Gastrointestinal diseases of backyard poultry are incredibly common, and whilst many potential pathogens can cause disease, the most common aetiology is poor husbandry. Of all the management failures, an inappropriate diet is the most common. Poultry should be fed a commercial pellet or mash, with a little maize or kitchen scraps given as a treat. Contaminated water is also an important cause of disease. Environmental stresses, such as being taken to a show or being rehomed, can allow the recrudescence of latent pathogens.

Many gastrointestinal pathogens, such as *Trichomonas* and *Salmonella* species, can be carried by wild birds. Owners should therefore try to discourage wild birds where possible.

Almost all pathogens are incapable of causing disease on their own, and improving husbandry is often the best prevention of all for gastrointestinal disease.

Conditions of the oral cavity:

FOWLPOX

In the wet form of the disease, white nodules occur in the buccal cavity, which often progress to become more extensive caseous lesions. Such lesions can potentially cause inappetence and dyspnoea.

There is no specific treatment for fowlpox, and the majority of cases have an uneventful recovery. Antimicrobials may be beneficial in cases of secondary bacterial infection. In the face of a local outbreak, a vaccination protocol can be implemented.

TRICHOMONIASIS

Trichomoniasis is caused by the motile protozoan parasite *Trichomonas gallinae*. *T. gallinae* tends to be an opportunistic pathogen (though it can be a primary pathogen), taking advantage of any damage to the oral, oesophageal or crop mucosa. *T. gallinae* is widely present in wild birds and can be spread through shared drinking water (not through the faeco-oral route). Pigeons are a commonly recognised source of the parasite.

T. gallinae causes caseous oral lesions, known as canker, causing birds to become inappetent and lose weight. The lesions can extend as far distally as the proventriculus. In certain cases, the lesions can be found in the liver.

Whilst clinical signs are suggestive, confirmation of the diagnosis requires microscopic examination (X40) to look for motile flagellate protozoa. This must be done within minutes of sampling, before the parasite dies. Trichomonads are pear-shaped and have four anterior flagella with a protruding posterior axostyle.

Affected birds are treated with metronidazole for 5-7 days. Since the organism can be spread via contaminated drinking water, affected birds should be removed from the flock. Water should be changed daily. The prognosis is guarded, even with treatment.

Conditions of the crop

Many owners will contact a veterinarian stating that their birds have an enlarged crop; however, providing that the bird is otherwise well, it is worth withholding food (not water) for a few hours to see if the crop reduces in size. When a bird is presented with a chronically enlarged crop, there are 3 potential causes:

- Sour crop
- Impacted crop
- Pendulous crop

When examining an enlarged crop, it should be gently palpated. One differing feature is the consistency of the contents; an impacted crop has hard contents, whereas sour and pendulous crops usually have fluid contents.

SOUR CROP

Sour crop is caused by a disruption of the normal flora of the crop, leading to a fungal overgrowth of *Candida albicans*. Although this is most commonly a condition of the crop, it should be noted that other areas of the digestive system can also be affected. Whilst there is no single cause for sour crop, the main predisposing factors include an inappropriate diet, antibiotic use and the presence of any disease affecting gastrointestinal motility. Although the condition is not contagious, more than one bird may be affected as they would have been exposed to the same predisposing conditions.

Affected birds are often dull and inappetent, with a large fluid-filled crop. Occasionally, these birds will have a yeasty-like odour to their breath. On post-mortem examination, the crop of affected birds will often have raised white circumscribed lesions, together with ulceration and mucosal lesions. The preferred treatment is to identify and treat/remove the predisposing factors and to reduce the crop using a crop tube. Inverting the bird and massaging the crop to remove its contents is used by some, but it carries a genuine risk of choking. Oral probiotics (dairy-free) should also be administered. In most cases, these steps alone are sufficient; however, antifungal agents such as nystatin may be given at 100000-300000 IU orally, daily for 10 days. Many owners will use apple cider vinegar to acidify the bird's gastrointestinal tract. Whilst there is evidence of a benefit to gastrointestinal health through acidification, in cases of sour-crop, it is unlikely that the decrease in pH will be sufficient to reduce the numbers of *Candida*.

The prognosis for sour crop is usually good.

IMPACTED CROP

Crop impaction is most commonly caused by birds ingesting long grass, hay, plastic or string, which can physically obstruct the crop and proventriculus. However, in rare cases, there may be underlying dysmotility of the gastrointestinal tract. Affected birds have a large, distended crop with hard contents that do not reduce after several hours of withholding food.

The outcome with conservative treatment is poor, and an ingluviotomy (surgical access into the crop) is recommended. The surgical technique for an ingluviotomy is beyond the scope of this article. It is nearly impossible to ascertain how far distally the blockage extends, so it may subsequently be discovered that more invasive surgery into the proventriculus or ventriculus may be necessary. Aftercare is very important in such cases to prevent the bird from gorging and putting pressure on the wound. The bird should be given water ad lib immediately after surgery and small amounts of food often (every 2-4 hours).

The prognosis of such cases is highly variable. If there is an underlying motility disorder, the condition will likely return. In the case of foreign bodies after surgical intervention, if there is no further obstruction more distally in the gastrointestinal tract, then the condition should not return.

PENDULOUS CROP

A pendulous crop is caused by a loss of tone of the crop wall and is most commonly seen in turkeys. It may be a sequel to chronic, subclinical crop impaction and over time escalates until the crop becomes so flaccid and pendulous that it is unable to empty without intervention. There is also thought to be a hereditary component in turkeys.

Affected birds will have a large pendulous crop that does not empty when food is withheld. Affected birds are often bright and will eat; however, they may lose body condition due to abnormal gastrointestinal tract function.

As with an impacted crop, the outcome without surgery to resect the flaccid crop wall is poor. As with any ingluviotomy procedure, aftercare is very important. Water is given ad lib post op, and food should be given little and often. The prognosis is guarded.

CAPILLARIA

Capillaria is a genus of nematode worm with many different species. Affected birds are often inappetent and lose weight. In young birds, severe burdens can lead to death.

Due to their pathogenicity, the presence of any *Capillaria* eggs (elongated shape with bipolar plugs) in faeces should constitute grounds for treatment. If treated in the early stages of infection, the prognosis is excellent.

A variety of anthelmintics can be used. Flubendazole (30 ppm in feed or 1.43mg/kg in drinking water for 7 consecutive days) and fenbendazole (2.5mg/kg in drinking water for 5 consecutive days) can be used. Eradiworm (levamisole, praziquantel) can also be used at 1ml per kg bodyweight.

Conditions of the proventriculus and ventriculus

The proventriculus and ventriculus (gizzard) are difficult organs to examine clinically. Radiography or endoscopy is the only practical diagnostic aid. The gizzard can vary considerably depending on the bird's diet. Birds with access to stones and grass tend to have a large, muscular gizzard.

Birds have a remarkable ability to ingest a whole range of foreign bodies of varying size. Foreign bodies of the proventriculus/ventriculus can lead to crop impaction (the crop fills once the ventriculus and proventriculus are full, and it empties once they are empty), inappetence and weight loss.

Diagnosis using radiography or endoscopy can be of assistance, but it should be remembered that small stones are a normal finding in this region.

Treatment involves surgical removal of the foreign body, the technique of which is beyond the scope of this article. The prognosis for such cases is usually good, provided that intervention is prompt.

PROVENTRICULAR PARASITES

There are several nematode species that can inhabit the proventriculus of poultry. These include *Tetrameres* spp., *Eustrongylides* spp., *Heterakis* spp., *Dispharynx* spp. and *Echinuria* spp. Proventricular worms are around 0.5cm long. They typically burrow into the proventricular wall and suck blood, causing inflammation, thickening, proventricular necrosis and anaemia. They are rare and are only pathogenic in large numbers. Affected birds are often lethargic, lay fewer eggs, are anaemic and have diarrhoea. In severe cases, death may occur.

Treatment is the same as previously mentioned for *Capillaria*.

GIZZARD WORMS

There are several spp. of worms that can infect the gizzard of waterfowl (rare in other poultry). Most of these worms belong to the genus *Amidostomum* and are mostly a problem in young birds. The worms burrow into the mucosa and feed on blood, leading to irritation and thickening of the gizzard wall.

Other endoparasites of the GIT

ASCARIDS

Ascaridia galli is a common nematode of backyard poultry. The adult worm infests the small intestine and can be up to 12 cm. Mild infections are asymptomatic. Heavier burdens cause weight loss, a drop in egg production, anaemia and in severe cases, intestinal obstruction.

Treatment is the same as with other nematodes.

CAECAL WORMS

Heterakis species are small worms about 1.5cm in length and can infect the caeca of all poultry. The worm is generally considered to be non-pathogenic.

Much more importantly, *Heterakis* worms can carry the harmful protozoal parasite *Histomonas meleagridis*, which is primarily a pathogen of turkeys but is becoming more commonly reported in free-range chickens.

CESTODES

Tapeworms are uncommonly diagnosed as a problem in poultry, and even when present, tend to be non-pathogenic. Some species can lead to weight loss, haemorrhagic enteritis, poor growth and inappetence. Diagnosis can be based upon finding either worms or gravid segments in faeces. Traditional treatments and prevention aim to control in intermediate hosts. Praziquantel is used at 10mg/kg.

TREMATODES

Flukes can occasionally cause disease in poultry (mainly waterfowl) and can lead to enteritis, weight loss, anaemia and emaciation. Snails act as intermediate hosts. Praziquantel at 10mg/kg can also be used.

HISTOMONIASIS

Histomonas meleagridis is a protozoan parasite that can cause disease in all poultry, excluding waterfowl. Turkeys are most susceptible, whilst chickens are relatively resistant.

The parasite is generally carried by *Heterakis gallinarum* (the caecal worm), although direct transmission (via contaminated water) has been documented. Once in the caecum, the parasite invades the mucosa, causing typhlitis, potentially leading to a sulphur yellow diarrhoea.

The parasite next crosses the coelomic cavity to the liver, where it causes focal necrosis (pathognomonic). The most frequent sign is sudden death. Those found alive will be dull, hunched up and have ruffled feathers. A cyanotic head is a rare clinical feature (giving the disease its common name: blackhead).

Treatment involves giving the birds metronidazole to destroy the protozoa, along with an anthelmintic to kill the caecal worms. Tetracyclines combined with tiamulin for 5 days could also be considered. The prognosis of clinical cases is poor.

COCCIDIOSIS

There are several species of coccidia (*Eimeria*) that can be found in poultry, most of which are host-specific. *E. tenella* is the only one that is likely to be of concern in backyard poultry.

There are no maternal antibodies against coccidiosis found in the young chick. Therefore, young birds are vulnerable to clinical disease if the level of challenge is great enough. Coccidiosis tends to be a flock problem as large numbers of oocysts are shed into the environment. Infection occurs through the ingestion of sporulated oocysts. As the parasite undergoes several rounds of sexual reproduction (to produce many more oocysts), the host's intestinal wall is damaged, leading to blood loss, bacterial overgrowth, necrotic enteritis, malabsorption and even septicaemia.

Affected birds are often dull, inappetent, hunched up with ruffled feathers and have diarrhoea. Acute infection can result in sudden death due to anaemia without any other clinical signs. Haemorrhagic caecal contents are noted on postmortem examination. Other lesions, such as inflammation, petechiae, thickening of the intestinal mucosa and white foci (shizonts) are also found. Where there is sufficient blood loss, the carcass will be pale and anaemic.

Diagnosis is based on clinical signs and history, with high faecal oocyst counts (>50000 oocysts per gram of faeces) backing up clinical suspicion.

Anticoccidial drugs such as toltrazuril (7mg/kg in drinking water for 2 consecutive days) or amprolium (20mg/kg in drinking water for 5-7 consecutive days) can be used. Secondary bacterial overgrowth can be controlled by using tylosin (20mg/kg) or amoxicillin (125mg/kg).

As for all conditions causing diarrhoea, nursing is very important to keep the bird hydrated and comfortable. Bedding should be kept dry to keep the birds comfortable and to slow down oocyst sporulation.

REFERENCES:

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MULTIPLE-CHOICE QUESTIONS

QUESTION 1

Mrs. Nel brings in a Polish Crested bantam that has been inappetent and losing weight. On clinical examination, you notice caseous oral lesions that resemble yellow buttons. What is the most likely diagnosis?

- a. Fowl pox
- b. Histomoniasis
- c. Trichomoniasis
- d. Fowl typhoid
- e. Cryptosporidiosis

QUESTION 2

How would you treat the Polish crested bantam?

- a. Anthelmintics
- b. Potentiated sulphonamides
- c. Parenteral nutrition
- d. Metronidazole
- e. Toltrazuril

QUESTION 3

Mr. Khan brings in his ill free-range white leghorn hen with an enlarged crop. You decide to admit the bird for observation and withhold food for a few hours. After a few hours, the crop still feels soft and fluidy as it did when the bird first presented. What is the most likely diagnosis?

- a. Sour crop
- b. Pendulous crop
- c. Impacted crop
- d. Gastrointestinal hypomotility
- e. Normal leghorn crop

QUESTION 4

What is the causative agent of sour crop?

- a. *Salmonella typhimurium*
- b. *Histomonas meleagridis*
- c. *Ascaridia galli*
- d. *Heterakis isolonche*
- e. *Candida albicans*

QUESTION 5

What is the dose of Nystatin for sour crop?

- a. 100000-300000 IU po for 10 days
- b. 100000-300000 IU po for 3 days
- c. 100000-300000 IU po once off
- d. 10000-30000 IU po for 10 days
- e. 10000-30000 IU po for 3 days

QUESTION 6

Which is the most likely host of *Amidostomum*?

- a. A battery hen
- b. Muscovy ducks
- c. Broilers
- d. Turkeys
- e. Orpington chickens

QUESTION 7

Which of the following is least likely to be infected with *Histomonas meleagridis*?

- a. A battery hen
- b. Muscovy ducks
- c. Broilers
- d. Turkeys
- e. Orpington chickens

QUESTION 8

Mrs. Scott's prized Brahma had chicks a few weeks ago. A few of the chicks have suddenly died. She brings in a sick chick, which dies on the examination table. You perform a postmortem examination and notice a pale carcass and necrotic enteritis, and haemorrhagic caecal contents. What is the most likely cause?

- a. Ascariasis
- b. Dysbacteriosis
- c. *E. coli*
- d. Coccidiosis
- e. Typhoid

QUESTION 9

What is the dose of toltrazuril?

- a. 7mg/kg
- b. 2mg/kg
- c. 17mg/kg
- d. 70mg/kg
- e. 20mg/kg

QUESTION 10

What is the dose of tylosin?

- a. 7mg/kg
- b. 2mg/kg
- c. 17mg/kg
- d. 70mg/kg
- e. 20mg/kg

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