

Faecal insight – what droppings tell us about our birds' health

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Modern commercial poultry should be given all the comfort possible to help them perform above the drawn out breed standards. The day old broiler chick has an average weight of 40g and grows into 2kg in just 35-36 days of age. These birds are hyperphagic, and need feed and water in ad libitum quantity.

Continuous selection and breeding to improve the growth rate, feed efficiency and production have increased both the feed and water consumption.

The fast growth phase is characterised by increased quantities of faecal and urinary water into the bedding material.

At six weeks of age, each bird will

excrete approximately half the amount of water consumed per day, into the litter on that day. Wet litter is commonly used to describe non-specific disease of gastrointestinal or urinary tract.

With disease onset, performance problems like increased feed conversion ratio, poor body weight gain, increase in marketing age, predisposition to other secondary bacterial infections and condemnation losses – start precipitating one after another.

Physiology

Water balance is equating intake and metabolic synthesis with output as urine (kidneys), faeces (gastrointestinal tract) and evaporation (skin and respiratory tract).

Water intake is dependent upon the ambient temperature and is 2.0-2.5 times that of feed intake. During the periods of dehydration, the thirst stimulation mechanisms are activated.

Over consumption occurs frequently because the absorption is sluggish and the cellular rehydration also takes time. Under these conditions, excess water is excreted as dilute urine to maintain water balance.

Chickens have a pair of kidneys and the ureters. The urinary bladder is absent in birds, therefore urine excretion is unique. First the ureters open into the coprodeum, then the urine passes retrograde up the colon to the caeca before being evacuated via the cloaca with the faeces.

The content of the urine is signifi-

cantly altered during its passage through the coprodeum, colon and caecae. The avian kidney processes a large volume of fluid and resorbs most of it through tubules. In normal birds, the reabsorption is greater than 95%.

An increase in urinary output will cause wet litter. This is often misinterpreted as diarrhoea or enteritis. Intestinal faeces are normally brown in colour with white urate cap and are excreted 12-16 times in a day. Caecal faeces are usually dark brown in colour. The ratio between intestinal and caecal droppings will be 7:1.

Faecal water content is altered by the characteristics of feed ingredients. It is directly affected by increasing ingesta osmolality or reducing transit time and absorptive surface area/function, which compromises water absorption and stimulates intake. This results in high faecal water and is called diarrhoea.

Enteritis is different. Here the gastrointestinal lining is inflamed, affects digestion and ultimately reduces nutrient and water absorption. This causes faecal water to increase above normal.

Enteritis is usually associated with pathological conditions. Diarrhoea is usually physiological in nature.

Causes of enteric disorders

● Infectious

Disease: Coccidian infections, bacterial infections caused by E. coli, salmonella, clostridium, Campylobacter jejuni and spirochaetes result in wet litter. Viruses such as REO, IB, IBD, Newcastle disease virus, adenovirus, rota virus, astro viruses, turkey corona viruses and toro viruses cause diarrhoea. Heavy load of internal parasites such as round worm and tape worm infestation cause diarrhoea.

● Non-infectious

- Feed: Structure and pellet quality, palatability, formulation and content, mycotoxins.

- Management: Available feed space, water space, distribution of feeders,

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Table 1. Comparison of coccidiosis and necrotic enteritis.

Coccidiosis	Necrotic enteritis
Caused by Eimeria protozoa. More than six species of Eimeria cause disease	Caused by anaerobic, toxin producing bacteria – Clostridium perfringens
Found in an ubiquitous manner	Found in faeces, soil, dust, contaminated feed and litter
Not a normal inhabitant of the gut	Normal inhabitant of the hind gut
Infection only as a result of ingestion of coccidian oocysts	Intestinal tissue damage, helps in colonisation by the pathogen
Causes immunosuppression	Not an immunosuppressive disease
Coccidiosis predisposes the birds to NE	NE is not a predisposing cause to coccidiosis
Droppings to contain raw/coagulated blood	Droppings watery, orange colour, more liquid in the droppings
Gross lesions seen throughout the intestine	Gross lesions usually confined to small intestine, primarily jejunum and ileum
Haemorrhages/raw blood in the intestine	Intestines are friable and distended with gas. Turkish towel appearance
Liver is not involved	Liver is not involved
Threat of coccidiosis is less during hot dry weather and greater in cooler damp weather and poor litter management	Threat of necrotic enteritis throughout the year
Self-limiting disease	Not a self-limiting disease

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drinkers, air quality, ventilation, litter, temperature and density.

Infectious causes

Avian intestinal Spirochaetosis often causes diarrhoea and impaired egg production both in laying hens and in breeder hens.

The birds affected with salmonella have diarrhoea with pasting of feathers around the vent. The disease caused by Salmonella pullorum is known as bacillary white diarrhoea. Diarrhoea and pasty vent are also seen in Pasteurella infections.

Necrotic enteritis (NE) caused by Clostridium perfringens is found worldwide. It occurs both as a clinical disease causing high mortality and sub

clinical disease which has a devastating effect on broiler production. Necrotic enteritis is associated with wet litter problems and affects production negatively. Though wet litter is due to many causes, the sub clinical necrotic enteritis is the most common infectious cause, which often goes unnoticed.

Coccidiosis is a protozoan disease which causes dysentery and frequently wet litter. Coccidiosis predisposes the birds to NE and the proper differential diagnosis will help in saving the birds by treating the exact cause.

In the nephropathogenic form of infectious bronchitis infections, the water intake will be high and results in scouring and wet litter.

Rotavirus infections cause diarrhoea, which is the main clinical sign. This is followed by litter eating and an inflamed vent. REO viral infections cause mucoid diarrhoea with a pasty vent.

- Ammonia (\$430)
 - FCR increases by 8 points.
 - Body weight decreases by 114g.
- Disease (\$120)
 - Mortality, morbidity and medication costs.
- Parasites (\$140)
 - Anticoccidial drugs, dewormers.
- Condemnation and downgrades (\$260)
 - Breast blisters
- Total = \$950 per 20,000 birds (approximately €5 per bird)

Table 2. Economic impact (Ref: University of Georgia, Cooperative extension).

Feed related factors

With modern breeding and selection procedures, high appetite and feed intake result in an increased feed passage rate. This is achieved by reduced time spent by ingesta in proventriculus and gizzard, however the retention time in the small intestine remains fairly constant.

This reduces the enzyme – nutrient contact, leading to reduced protein digestibility and reduced feed efficiency. The passage of undigested nutrients not only has an implication on reduced digestion and absorption but also affects the gut ecology and causes wet litter.

The characteristics of feed ingredients will affect the feed passage time and the water content of faeces.

Nutritionally induced excessive thirst, abnormally large production of urine and diarrhoea are caused by poor quality raw materials that contain high oligosaccharides or minerals. This leads to reduced surface area available for nutrient absorption and paves the way for pathogenic infiltration and a systemic disease.

Management factors

It is critical to maintain watering equipment in good repair. Automatic watering equipment in poor working order can cause wet litter problems. A high drinker line water pressure can result in more water wastage and wet litter. Water lines that are too low can result in wet litter. Nipple drinkers with drip cups have been shown to reduce water spillage compared with bell drinkers or nipples only, thereby decreasing the risk of wet litter and contact dermatitis.

Moisture content in the litter should not exceed 25-30%. If the moisture content becomes high, then cake formation of the litter occurs. The broilers grow on damp and sticky litter.

The water is unable to escape from the cake. The litter should be raked or replaced with new litter material to prevent the problem becoming worse. Usually carcasses from the birds that are grown under these conditions are condemned in the processing plant. Excess moisture in litter increases the incidences of breast blisters, skin burns, bruising, pododermatitis, condemnations and downgrades.

Summary

The condition of the droppings is a good indication about the birds' intestinal health. One needs to give some more attention to droppings while visiting the farms, which will help to identify the issues, if any, in time to resolve them. ■