Three vital questions for improving layer gut health

Layer gut health is key for optimum performance, immunity and welfare, and for good gut health, the bird needs a diverse and balanced microbiome. When assessing the situation, we should first ask, "is there an issue with layer gut health?" This should be followed by, "how do we monitor gut health and know if the gut microbiome is diverse and balanced?" and, lastly, "when a gut health issue is identified, how do we address it?"

by Harriet Walker,
Poultry Specialist,
Alltech Gut Health Management.
www.alltech.com

Is there an issue with layer gut health?

Traditionally, layers have been put in cages, which benefitted egg producers, including efficient use of available space, increased number of birds per house, more automated processes, easier management, greater hygiene, reduced incidence of infectious diseases, and lower feed consumption and production costs.

However, cages limit or prevent locomotion, ground-scratching, wing-flapping and flying. Therefore, there is pressure for birds to be cage-free and, ultimately, free-range. The European Commission announced that, by the end of 2023, a legislative proposal will phase out, and finally prohibit, the use of cages for several farm animals, which will result in an increase in the numbers of layers reared in a cage-free system.

A recent Egg Track Report 2021 showed that 219 egg producers, retailers, food service companies and hotel chains have committed to transition fully to 100% cage-free eggs by 2025, with 47 of these companies expanding their commitments to cover their global supply.

For farmers and integrators, this means there will be more pressure to transition from a cage system to a cage-free system. Therefore, it is time to think about new challenges or challenges that may be heightened when moving to a cage-free production system.

Cage-free houses include free-range, organic and barn, which provide laying hens with greater space, enabling higher mobility and increased expression of the bird's natural behaviour.

However, cage-free farming can be associated with some welfare concerns and potential gut health issues due to the increased ability of the birds to mix, move and have contact with litter and the outside environment, which need to be addressed by egg producers.

Potential welfare and gut health issues of cage-free systems include:

- **Higher mortality and antibiotic usage:**
There is increased exposure to potential disease-causing organisms in cage-free environments, contributing to higher levels of mortality. To support performance and reduce mortality when changing to a cage-free system, farmers may turn to antibiotics. However, the use of antibiotics and associated antimicrobial resistance has been pointed out as a global health problem for humans and animals.

  Therefore, with the greater chances of cage-free birds encountering pathogenic bacteria, the bird must have optimum gut health and microbiota to avoid the use of antibiotics. As approximately 70% of the immune system functions through the gut tissue, the gut microbiota plays a role in modulating the immune system.

- **Feed consumption:**
As layers move into cage-free systems, they can perform more natural behaviours. This increased movement can raise the metabolic energy needed by the hen, which can be further affected by adverse weather conditions. The bird will need to increase its intake to meet this heightened energy requirement, otherwise, energy will be diverted away from egg production to maintenance.

  This means that it is vital that the bird has optimum gut health so that its intestinal surface area is maximised to allow for efficient nutrient absorption and improved feed utilisation.

  Developing and maintaining the bird's microbiota diversity will improve gut function, morphology and nutrient absorption.

- **Wet litter:**
In cage-free systems, layers have more contact with litter than when housed in cages. Wet litter can lead to footpad dermatitis and bumblefoot, a painful footpad infection, which can be several times higher in litter-based houses. Wet litter can occur due to a change in the gut microbiota population.

  When a bird's gut microbiota is unfavourable, pathogens can colonise it and release toxins that damage the epithelium cells, meaning the bird's ability to digest and absorb nutrients from the diet will be reduced.

  This results in undigested feed reaching the caecum and causing further growth of unfavourable bacteria and more damage resulting in a reduced ability of the bird to absorb water from the digesta, leading to watery excreta and wet litter.

  The wet litter is made worse by the passage of undigested feed, especially the fat in the diet, as fat is the most difficult nutrient to digest and absorb. Due to fat's hydrophobic properties, it will not mix with water and will sit on the surface of litter, causing a cap. As a result, litter quality and intestinal/caecal droppings can give a good indication of intestinal health in the bird.

All these areas of concern can be affected by gut health and the diversity of the gut microbiota. The bird's microbiome influences the pathogen control, intestinal integrity and morphology, nutrition and growth, immune function, inflammatory response, and metabolism of the bird.

Maintaining the gut health and diversity of the microbiome improves the bird's immunity, performance, egg production and welfare.

How do we monitor gut health and know if the gut microbiome is diverse and balanced?

Non-pathogenic and pathogenic agents can cause gut health issues, diarrhoea, reduced performance and wet litter. Therefore, the underlying cause must be identified, and corrective actions are implemented as soon as possible to return the bird to optimal gut

Continued on page 13

Continued from page 11
health. Gut health is difficult to measure because the gut is an internal organ. Traditional gut health of the flock would be monitored in one of two ways:

- **Posting birds:**
A trained professional would identify health status by examining the gut tissues; however, this is invasive and requires sacrificing birds.

- **Blood or faecal samples for analysis:**
This can be costly and time-consuming.

Therefore, Alltech has developed a third way to monitor health status by looking at the birds' droppings and litter via the Alltech Poultry Manure Online Scoring System. Assessments can easily be completed when walking the birds for routine health checks.

This system is unique because we are looking at more than just coccidiosis. Gut health issues can be caused by many factors, including mycotoxins, coccidiosis and dysbacteriosis, all of which can reduce gut integrity and damage the intestinal epithelium. This can result in decreased absorption and digestion of nutrients and increased intestinal barrier permeability, which leads to changes in the colour and texture of faecal droppings and litter. As a result, litter quality and intestinal/caecal droppings can give a good indication of intestinal health in the bird.

How does the system work?

Birds produce two types of faeces, identifiable by differences in texture and colour:

- **Intestinal droppings:**
A healthy intestinal dropping should be brown in colour, reasonably dry and without any grains present.

- **Caecal droppings:**
A healthy caecal dropping should be a pasty consistency and dark brown or black with no bubbles.

Deviations from these characteristics highlight potential issues within gut health and their severity. The best time to start looking at layer manure is as soon as the birds reach the rearing or layer house and should be conducted weekly.

Regular monitoring will help identify changes in gut health early and hopefully before performance is affected. This means that the underlying cause is identified, and corrective actions are implemented as soon as possible to return the bird to optimal gut health.

Looking at gut health throughout the life of the flock gives the producer the ability to make measured changes to the production system.

The poultry manure online scoring system is not designed to replace the vet. However, it is an excellent tool for consulting with vets without needing an on-farm visit.

By uploading photos to the manure scoring system and sending them to the vet for analysis, the farmer can save a lot of time and get answers to fix problems before they develop.

The scoring system can be used in combination with the Alltech faecal poster to help the poultry manager identify good and bad droppings, and they can both be used to help educate as to what is normal and should be seen on-farm.

Support and rehabilitate the microbiome diversity

When a gut health issue is identified or expected to develop, it is crucial to ensure that birds are exposed to favourable organisms as early as possible to support gut health. Ideally, this would start in the breeders as chicks are first exposed to bacteria in the hatchery, which comes from the breeder.

To ensure that birds are exposed to favourable organisms when in the rearing and layer sheds, there are two main routes to seeding the gut:

- Adding a probiotic to the feed that promotes the development of a diverse and balanced microflora population.

- By building up a favourable bacteria population in poultry houses over numerous flocks using probiotics, prebiotics and products that can reduce the intestinal tract's pH.

Developing and maintaining a diverse microbiota improves pathogen control, intestinal integrity and morphology, nutrition and growth, immune function, inflammatory response, and metabolism of the bird.

While the microbiota is developing, it is important to make the environment favourable for beneficial bacteria and maintain it during times of stress. During the production cycle, there are periods where a stressor, like a pathogen challenge, change of feed or antibiotics, can reduce diversity and lead to a build-up of the bacteria that like the current situation, which can be pathogenic or resistant strains.

To minimise the occurrence of dysbiosis and the need to use antibiotics, it is vital that, once the bird has established a good microflora population, it is maintained and pathogens are controlled.

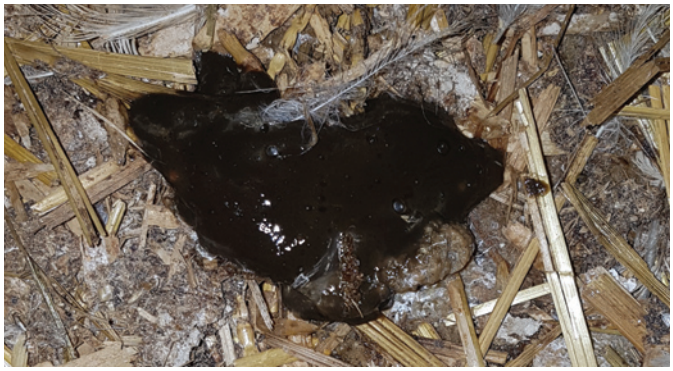
Incorporation of products that contain organic acids (such as Acid-Pak products from Alltech) can, through secondary activity, help to lower the pH in the gastrointestinal (GI) tract and help the bird sustain a good microflora population.

A low GI tract pH reduces the growth of pathogenic organisms such as clostridia and campylobacter, which are intolerant to acidic conditions. To control pathogens, a supplement (such as Actigen from Alltech) can be added to the feed to weed out and reduce colonisation of the gut by pathogenic bacteria.

Conclusion

Layer gut health is key to optimum performance, immunity and welfare. Therefore, measurement is essential so that health can be improved and maintained. To achieve good gut health, the bird needs a diverse and balanced microbiome, which can be developed and maintained through the Alltech Seed, Feed, Weed programme. This will improve gut health, performance and the ability of the bird to defend itself against pathogens. ■

Healthy caecal droppings (Dr K. R. Price).



Healthy intestinal droppings (Dr D. G. Sandu).