

## COCCIDIOSIS, NECROTIC ENTERITIS CHALLENGE CAGE-FREE LAYER SYSTEMS

**Chris Wright, Poultry Health Today sponsored by Zoetis**

Cage-free housing for egg layers allows birds to exhibit more natural behaviors, but it also carries an increased risk for morbidity and mortality, according to a report at the 2017 Midwest Poultry Conference.<sup>1</sup>

The upswing in cage-free housing is a response to consumer demand for eggs from birds raised in a more natural environment, which enables behaviors such as perching, taking short flights, dust bathing, and wing flapping, said Danielle Botting, DVM, MPH, Hy-Line North America.

However, a study by the Coalition for Sustainable Egg Supply demonstrated that over a 16-week production period, birds in cage-free production had a 12% cumulative mortality, compared to just over 4% mortality for layers in conventional and enriched (colony) cages, Botting said.

There are numerous reasons for increased disease risks in cage-free housing, but a primary reason is increased contact with manure compared to layers housed in colony or conventional systems. The birds have more exposure to bacteria and parasites, resulting in the emergence or re-emergence of several diseases, Botting said.

Bacterial diseases more likely to be seen among layers in cage-free systems include *Escherichia coli*, necrotic enteritis, focal duodenal necrosis, and infectious coryza. Parasitic diseases more likely to be seen in cage-free layer systems include coccidiosis, mites, and worms, she said.

### Coccidiosis is a leading parasitic problem

Of the parasitic-disease problems in cage-free layer systems, coccidiosis tops the list. The resulting intestinal damage leads to poor nutrient absorption, increased mortality, decreased production, and poor shell quality, Botting continued.

Coccidiosis was never a big issue with layers in conventional or colony cages. But for layers in cage-free systems where birds have contact with the ground, control of the disease is a critical issue, just as it is for the broiler industry.

Nine species of *Eimeria* affect layers, and they are *E. acervulina*, *E. necatrix*, *E. maxima*, *E. brunetti*, *E. tenella*, *E. mivati*, *E. mitis*, *E. praecox*, and *E. hagani*. Each species affects a different part of the gut, and the clinical disease varies from highly pathogenic to no lesions at all. It is well known that even in its subclinical forms, coccidiosis negatively affects production parameters, she said.

The clinical signs of coccidiosis include mucoid-bloody diarrhea, dehydration, lethargy, depression, weakness, ruffled feathers, anemia, elevated morbidity/mortality, poor growth/weight gain, uniformity issues, and drops in egg production.

Post-mortem, the tell-tale signs of coccidiosis are enteritis, blood in the small intestines and ceca, a distended gastrointestinal tract, and necrotic enteritis, Botting said.

Treatment, control and prevention strategies for coccidiosis are well developed due to the broiler industry's long-time experience with the disease. This includes use of a coccidiosis vaccine administered at the hatchery, as well as the use of anticoccidials in the water or feed.

To achieve long-term immunity against coccidiosis with vaccination, good management is critical during the pullet growing stages, Botting emphasized. There's no substitute for proper, uniform vaccination at the hatchery, but in the brooder house, the birds also need a continuous supply of water and feed as well as proper litter moisture and the use of brooding paper to stimulate the right amount of coccidial oocyst sporulation in the gastrointestinal tract.

The goal is to achieve at least three full cycles of the different *Eimeria* species in the vaccine. The chicks are given a controlled dose of the vaccine at the hatchery, with the first cycle of oocyst shedding taking place at 4-7 days of age. The second oocyst shedding and re-ingesting cycle occurs at 14-21 days of age, while the third cycle takes place from 28-35 days of age.

### Necrotic enteritis as a 'new' disease

Necrotic enteritis isn't an issue among layers raised in conventional or colony cages, but it can be a new disease for layers in cage-free layer systems. The intestinal damage caused by coccidiosis allows for the overgrowth of *Clostridium perfringens*, which produces toxins, and the result can be necrotic enteritis, Botting explained.

Key clinical signs of necrotic enteritis are rapid, elevated mortality, depression, and ruffled feathers. Post-mortem, the intestines are distended and friable with foul smelling intestinal contents, and the mucosa may be covered in a brownish diphtheritic membrane.

Effective coccidiosis control is the best way to prevent necrotic enteritis. To treat the necrotic enteritis, antibiotic treatment in the feed or water is needed.



The challenge in transitioning to cage-free operations, Botting said, is making the switch without compromising flock health, welfare, production, and performance. This requires a concerted effort; increased education and training of producers and their employees is needed to successfully accomplish that transition, particularly regarding diseases, vaccines, and medications.

More disease monitoring via serology and environmental sampling is also essential to identify the bacteria and parasites affecting cage-free flocks. As always, adherence to strict biosecurity procedures is imperative, she said.

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<sup>1</sup> Botting D, et al. Emerging Diseases in Cage-Free Production. 2017 Midwest Poultry Conference, St. Paul, Minnesota.