Managing bacterial disease in cage-free systems

In cage-free systems, it's not only the birds that are moving around more freely. According to Eric Gingerich, DVM, technical services specialist with Cargill's Diamond V, bacterial transmission is also quicker and more efficient when birds are roaming uninhibited in large groups, underlining the importance of effective disease management.

Increased exposure to litter and feces in free-range houses combined with dust inhalation can promote bacteria transmission into the birds' respiratory tract. Inhaled ammonia from wet litter can also increase flock susceptibility to bacterial infections.

With organic or pastured flocks, water puddles outside are popular hydration sources, Gingerich explained — but they are also sources of bacterial pathogens. Outdoor access also increases exposure to wild animals and the bacterial diseases they carry.

Furthermore, feathering issues can become more problematic because of greater interaction with flock mates. Feathers provide a barrier against bacteria entering through the skin. If feathering is reduced this protection is absent and there is more potential for bacteria to enter.

Lurking disease risks

The bacteria that thrive in cage-free environments are linked to a number of economically impacting diseases.

From an economic standpoint, *E. coli* infection is likely to be the most damaging as it is the most widespread problem in the industry, followed by infectious coryza, fowl cholera and erysipelas, Gingerich explained according to the annual disease survey of the Association of Veterinarians in Egg Production.

The other most significant loss-causing diseases are campylobacteriosis (spotty liver disease), focal ulcerative dermatitis (FUDS), colibacillosis (caused by *Escherichia coli*), mycoplasmosis (caused by both *Mycoplasma gallisepticum* and *M. synoviae*), clostridiosis (gangrenous dermatitis and necrotic enteritis), and focal duodenal necrosis (FDN), he added.

In Gingerich's view, the biggest impact of most bacterial diseases in cage-free layers is increased mortality. Another risk, depending on the disease involved, is egg production loss due to morbidity. Assuming no loss of daily percent production, the loss of eggs per hen housed from mortality due to mild, moderate, or severe mortality is estimated to be 4 to 16. Using 2023 egg values and costs, the losses per hen are in the neighborhood of $0.28 to $1.12 per hen housed.

Chronic inhalation or ingestion of bacterially contaminated air, water, or litter can lead to intestinal or respiratory subclinical disease, adversely affecting feed conversion and performance.

Successful control strategies

According to Gingerich, there are multiple options to manage these diseases effectively, even as producers face pressure to reduce the use of antibiotics.

From his experience, he recommends various strategies, such as maintaining coliform-free drinking water by using continuous water-line sanitation with chlorine dioxide and verifying that the system works.

Producers should speak with their veterinarians about the best methods to thoroughly clean and disinfect the house between flocks, including removing biofilms from water lines.

Other helpful measures include effective biosecurity, which prevents the introduction of new pathogens, and using available vaccines against historically prevalent bacterial, protozoal, and viral diseases on the farm.

Certain vaccines are given as boosters during lay to avoid late lay-cycle mortality, Gingerich said, adding that a veterinarian can offer guidance on best practices.

Meanwhile, maintaining good feathering throughout lay provides feedback to the nutritionist, who can adjust rations based on this information. Gingerich recommends using bird breeds that historically retain feathering.

Mycotoxin avoidance is another aspect of disease control that a nutritionist can oversee, as their consumption may result in immunosuppression.

The role of feed additives

“The use of feed additives that promote beneficial bacteria, a more robust immune system, and improved intestinal resistance to bacterial infections are also effective options,” said Gingerich.

“The non-antibiotic additives like postbiotics, probiotics, prebiotics, and phytogenics all help birds fight bacterial diseases.”

These feed additives promote the growth of beneficial bacteria in the gut, Gingerich explained, thereby helping to reduce the shedding of harmful bacteria into the environment.

They also support gut integrity, which builds a barrier against invasion and strengthens the immune system’s response to pathogens.

“Use feed additives that research shows are effective and give a good return on investment,” Gingerich said.

Additionally, combinations of postbiotic and phytogenic feed additives may help reduce losses due to *E. coli* infection.

“Seek information from your feed additive suppliers,” Gingerich advised. “Ask what they’ve found is working to reduce the severity and incidence of bacterial diseases.”

“And as always, look at the data and research to guide your decisions and help you understand the potential impact an additive might have on your flocks.”