

# A multi-factorial approach to maintaining flock health

Maintaining the performance status of a whole flock of birds depends on the health of the individuals within the flock and so it is important that all birds have access to products that can help control conditions and pathogens in the gut. It is well known that maintaining health in a flock of birds is multifactorial, involving biosecurity, housing management and environment, litter (from wet droppings), water and feed quality and nutrient digestion.

by Alltech Poultry Team.  
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In an era when antibiotics are limited or banned as prophylactics, and there are more diverse management systems being used to meet consumer demands for welfare and 'natural production' (such as free-range and organic production), maintaining gut health is crucial for the health of the entire flock.

Certainly, outdoor access can expose birds to more environmental pathogens and stressors, which can lead to poor health and higher mortality.

Functional feed and water supplements to facilitate better gut health may be administered via water or feed and making sure all birds have good access to drinkers and feeding pans is key to individual and whole flock health.

Utilising proven technical ingredients in both feed and water are a good way to

ensure that, despite external influences and contamination, the health of birds is maintained through modulation of internal bacterial populations in the gut.

In young birds, at placement, access to clean sources of feed and water is important. However, it has been shown over many years of research that establishing an appropriate and properly functioning hind gut microflora is a positive contribution to the development and robustness of the enterocyte cells lining the gut, the mucous layer and gut-associated lymphatic system, which is the first line of immune defence in the gut.

This leads to increased energy in the form of volatile fatty acids and nutrient availability to the bird, allowing better growth and more efficient feed conversion, even in the absence of antibiotics and with extra exposure to pathogens from the environment, especially for birds with outdoor access.

## Planting the seed

Interventions to promote gut health include the use of feed enzymes to allow efficiency of digestion and absorption of nutrients in the upper ileum, as has been shown since the 1990s. This prevents the flow of nutrients to the hind gut, where they are used as substrates by bacteria, promoting both colonisation by pathogens and disease conditions.

Acidifiers can be used in feed or water to

decrease the pH in the gut, which inhibits the growth of harmful or undesirable species and promotes the activity of certain acid-loving, beneficial gut bacteria, such as *Lactobacillus* spp.

Probiotics can be used to 'seed' the immature gut with beneficial bacteria. It has been shown that such beneficial organisms used in probiotic preparations produce their own antibiotic compounds and can help maintain the integrity of the gut wall by improving the gut cell cytoskeleton and mucin production.

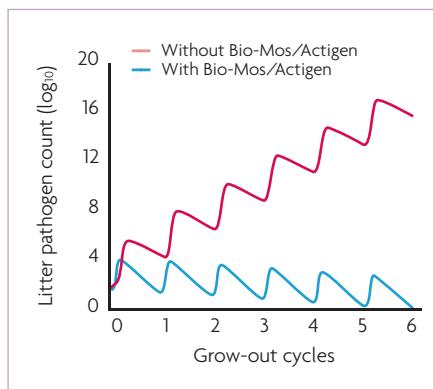
Prebiotics, such as mannan-oligosaccharides (MOS) have been shown to successfully bind pathogenic bacteria via thread-like fimbriae, allowing harmless elimination in faeces, as well as presenting the pathogens to sampling cells in the gut, alerting the immune system to pathogens in the environment.

These different mechanisms represent the concept of 'seeding' the gut with correct, beneficial bacteria from probiotics, 'feeding' the microflora with appropriate nutrients, such as fibre, without exposure to nutrients that will encourage growth of pathogens (via enzyme activity) and 'weeding' out unfavourable bacteria by binding and elimination through acidifiers or MOS activity.

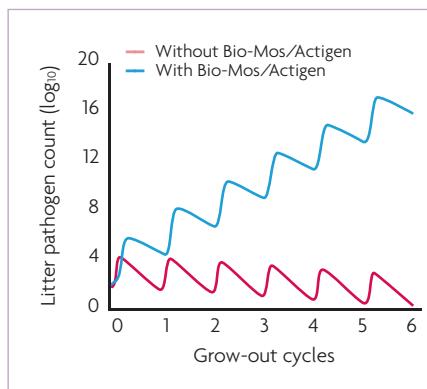
For example, there is a vast body of research confirming the usefulness of products, such as yeast cell wall derivates used in Actigen, a specific MOS product. Hence, research on this product will be used

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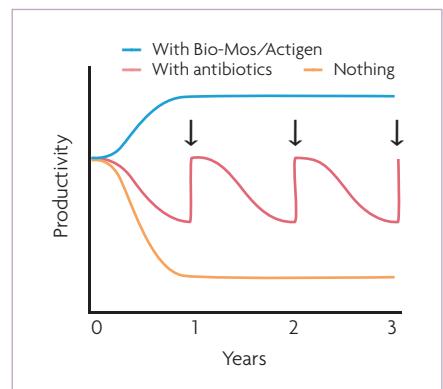
**Fig. 1. House pathogen epidemiology.**



**Fig. 2. House flora epidemiology.**



**Fig. 3. Growth promoter program.**



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to illustrate how promoting gut health can affect whole flock performance and the responses of subsequent flocks reared in the same environment.

Actigen has been shown to maintain broiler growth performance to the same levels as antibiotics in feed in 11 replicated trials.

This is because when pathogens are bound irreversibly they are unable to replicate and colonise the gut and cannot secrete toxins that damage the gut lining.

Trials have shown that feeding Actigen to facilitate this effect at levels of 400g per kilogram of feed significantly increased villus height by 6.6% (due to reduced erosion),

increasing the absorption surface for nutrients.

All broilers have a maximal genetic potential for growth, due to careful selection over the decades. However, many fail to reach this, due to poor gut health and exposure to pathogens. Flock uniformity, in terms of growth and weight gain, is important, especially for the economics of production and the welfare of the individual birds.

Gut health plays an important role in the uniformity of the flock and allows subsequent flocks to be more predictable and uniform in their performance. This is due to less recontamination of the housing environment, as well as fewer smaller birds,

which find it harder to compete with larger individuals for feed and water and often exacerbate body weight differences at the end of grow out.

Sims et al. (2002) showed a significant reduction (22%) in variation, calculated from the coefficient of variation in body weight in female broilers fed MOS (7.6% in non-supplemented control versus 5.9% in those receiving feed containing MOS).

### Studying whole flock performance

Sometimes, results from controlled research trials do not always reflect actual performance in the whole flock, due to other factors in the commercial environment.

Research into whole flock performance conducted by the specialist poultry vet Dr Stephen Collett showed that, with the proper administration of such natural alternatives to antibiotics in feed, flock health improved over subsequent broiler placements.

Indeed, during the first flock placement with birds exposed to *Salmonella enteritidis*, where 80% of the birds were infected in the control group (no MOS in feed) at seven days old, there were only 40% infected birds fed MOS at the same age, and the levels of MOS-supplemented birds declined to 20% of the flock at 26 days of age and 0% at 40 days of age, which was a week in advance of beneficial changes in the control group.

Such findings in commercial flocks are important, as improving gut health will, over time, reduce levels of pathogens in the environment (litter, housing, other birds, etc).

In normally contaminated flocks, which are not supplemented with any gut health products, levels of pathogens in the litter increase with each subsequent flock, especially in countries where litter is not removed between flocks raised.

When feeds are supplemented with MOS, litter pathogen counts remain consistently low with minimal fluctuations, whereas colonies of beneficial bacteria in the litter increase for each subsequent flock reared in that house. In contrast, further work showed major fluctuations in broiler productivity when antibiotics were administered to the flock over a period of years.

To maintain whole flock gut health, performance and uniformity, it is important to use proven, active compounds in water and feed. This will ensure pathogens are kept to a minimum in the bird's gut and in the housing environment.

Trial work has shown that these practices, over time, can reduce pathogen loading in each flock and in poultry housing over a much longer period, even years, to levels exceeding traditional antibiotic use. ■

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References are available  
from the author on request