

Dietary phytochemicals make economic sense for poultry producers

Securing health and performance of the flock throughout the production cycle reduces the need for additional management input and protects producer investment. The benefits of supplementing feed or drinking water with natural phytochemicals, such as oregano essential oil (OEO), are substantial.

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With a growing number of published trials alongside proven efficacy in the commercial environment for both broilers and layers available, confidence to use such products amongst vets, nutritionists and producers is expanding. The current combination of rising feed prices demanding producers focus on driving greater feed efficiency and the need to reduce antibiotic intervention, leads experts to predict that these natural phytochemical products for use in feed and management programmes globally will only increase.

Phytochemicals and poultry gut health

Improving gut health of all poultry species can have a direct impact on overall bird health and performance. The bird's gastrointestinal tract plays a critical role in nutrient absorption and approximately 70% of immune cells reside within the gut. Therefore, producers who understand the importance of maintaining a healthy gut and ensuring a balanced and diverse gut microbiome, will likely benefit from optimal flock health, performance and profitability.

In addition, supporting bird health can also be beneficial in reducing the need for therapeutic antibiotics.

A healthy, robust bird is far better able to deal with disease and environmental challenges, thus helping producers to reduce reliance on antimicrobials, which is of fundamental importance in the fight against antimicrobial resistance (AMR) and safeguarding the future

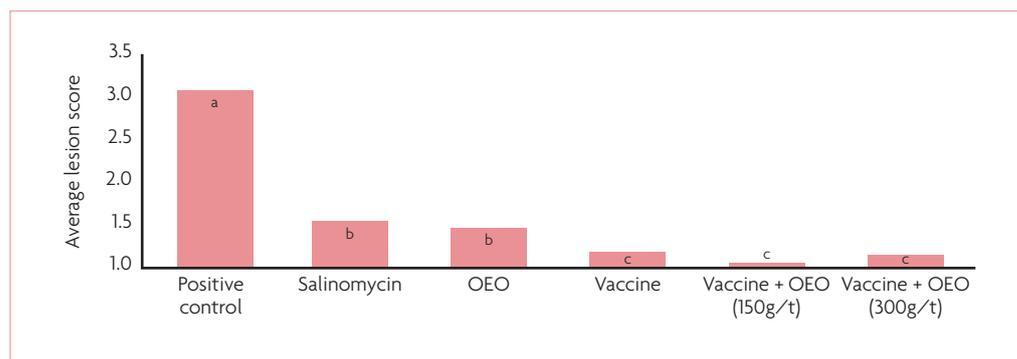


Fig. 1. Average lesion scores in broilers following *Eimeria* challenge ($p < 0.05$). OEO was Orego-Stim from Anpario and vaccine was Coccivac-B52 (Southern Poultry Research Inc, 2016).

efficacy of antibiotics. Natural phytochemical feed additives, such as oregano and thyme, have been extensively studied and the benefits surrounding supplementation of poultry feed with essential oils are well documented.

Natural OEO is an effective antimicrobial. It is important to remember that there are several different types of oregano oil available, including synthetic, natural, fresh or dried varieties. For best results it is always advisable to use a source of 100% natural oregano essential oil, as it is the synergistic action of the multitude of naturally occurring compounds within the oil which provides optimal benefits.

Natural OEO contains over 100 active compounds, enabling this particular phytochemical to offer anti-inflammatory, antioxidant, anti-protozoal and immunomodulatory properties, as well as antibacterial action. As a natural flavouring compound, OEO also helps to increase voluntary feed intakes to support performance.

OEO supports coccidiosis control programmes

Coccidiosis is a common issue for broiler producers worldwide and in a recent published paper by Blake et al., 2020, has been estimated to result in global costs of €8.6-14.6 billion annually.

Coccidiosis infection, and to a lesser extent coccidial vaccination,

can significantly damage the gut wall lining and lead to development of intestinal lesions.

The damage to the gut is associated with impaired nutrient absorption and can result in clinical symptoms such as reduced bird performance due to poor feed conversion ratio, slower growth rates, blood in excreta, loss of appetite and elevated flock mortality of up to 100%.

Coccidiosis, which is a predisposing infection to secondary diseases such as necrotic enteritis and bacterial enteritis, was recently estimated to result in losses of €0.18 per 2.5kg broiler.

Once these clinical signs are apparent, it is likely too late to help control the outbreak in the flock. Sub-clinical coccidiosis is prevalent in 100% of broiler environments and can have a detrimental impact on broiler performance.

Therefore, protecting the bird from initial sub-clinical infection and supporting gut health is the most effective way to control coccidiosis infection and maintain broiler health.

Traditionally, coccidiosis control has been via the use of chemicals, ionophores and vaccines, each of which come with their own challenges. However, extensive research has been conducted to determine how phytochemicals, such as OEO, can support coccidiosis control programmes.

A 2016 trial conducted by Southern Poultry Research Inc in the US demonstrated that OEO (Orego-

Stim, Anpario) supplementation did not interfere with anticoccidial vaccine immunity and when used on its own, or in combination with a live vaccine, birds were supported in achieving their genetic potential during a coccidiosis challenge.

The trial also showed that OEO supplementation enabled low level coccidial cycling in the litter, which is essential for the development of the bird's natural immunity against coccidiosis.

In addition, the results of the work conducted by Southern Poultry Research proved that OEO supplementation, in conjunction with vaccination, significantly lowered average lesion scores compared to the anticoccidial salinomycin and the positive *Eimeria* infected control group (Fig. 1).

Previous work has shown that OEO has a beneficial effect on gut cell turnover, thus supporting healing and repair which may help to minimise the severity of lesions commonly associated with coccidial challenge.

Effect of OEO on gut health of layers

A recent 2020 university trial conducted by North Carolina State University found that the supplementation of OEO (Orego-Stim, Anpario) helped to support development of the gut structure in pullets.

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OEO supplementation increased villus height, resulting in an increased surface area for nutrient absorption and also resulted in a deeper crypt depth which supports digestive function (Fig. 2).

As a result of OEO supplementation, the study demonstrated a five-point improvement in average feed efficiency and optimal gut development to support lifetime laying performance.

OEO and laying hen performance

Improved laying hen performance with OEO has been shown in a recent commercial study with Hy-Line Brown hens at a large layer farm in Western Europe.

The 2020 commercial study demonstrated that adding 100% natural OEO (Orego-Stim, Anpario) to layer diets resulted in more saleable eggs per hen and reduced flock mortality.

Supplementation of the non-synthetic OEO feed additive over the 66-week laying period resulted in 13 more eggs per hen and a 2.2% reduction in mortality.

Egg quality and grade were also improved compared to hens fed the

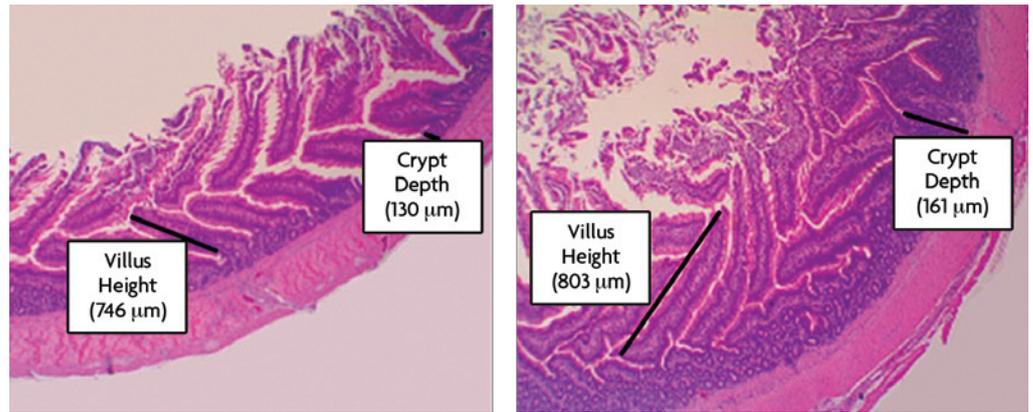


Fig. 2. Photomicrograph (x 40 magnification) demonstrating the beneficial effect of oregano essential oil (right) on development of villi and crypts within the gut, specifically the jejunum, of poultry (NCSU, 2020).

control diet. OEO supplementation resulted in fewer liquid, cracked and dirty eggs, providing a 1.6% increase in first class eggs and an increased number of medium and large eggs, with fewer small and peewee grades.

In addition, the hens fed diets supplemented with OEO demonstrated an improved feather cover over the whole of the bird, from the head and neck to the back and vent.

Feather cover is essential to minimising body heat loss and overall welfare and is of particular importance for free range

production where hens are exposed to enhanced environmental challenges.

In this study, the beneficial combination of improved egg quality, egg numbers and larger egg weights resulted in more saleable eggs, increasing the producer's income.

The producer received a 26.9% and 21.6% higher income from extra-large and large eggs respectively, compared to the control shed. In this instance, this gave the producer an impressive return on investment of 5.5:1.

OEO: naturally more profitable

The benefits associated with the improved health and performance of poultry species offered oregano essential oil can result in substantial economic benefits in today's modern production systems.

Feed additives which deliver a consistent, high quality source of oregano essential oil, offer producers a natural solution to support health, maintain optimum performance and boost profitability. ■