

Managing inflammation during the initial growth stage of chickens

In the context of antibiotic reduction, anti-oxidant and anti-inflammatory ingredients have been widely investigated and proven to bring health benefits.

by Marina Panheleux,
Poultry Department,
CCPA GROUP, France.
www.groupe-ccpa.com



Scutellaria baicalensis.

A study was led to evaluate the effects of a combination of plant extracts (Scutellaria baicalensis and Curcuma) with recognised antioxidant and anti-inflammatory properties on growth and feed efficiency of broilers (three groups of eight replicates with four Ross 308 male chickens).

Zootechnical performances (body weight, average daily gain, feed consumption and feed conversion ratio) were measured.

The demedication challenge

Antibiotic reduction in the poultry sector requires a multi-pronged approach through health conditions (vaccinations, biosecurity, etc), rearing techniques and nutrition. Prevention is the mainstay of the approach intended to reduce antibiotic use in livestock farming.

The work of Theo Niewold has led to an improvement in scientific knowledge on antibiotics and how they act, demonstrating, for instance, the anti-inflammatory effects of antibiotic growth factors.

At the same time, the interest in ingredients with anti-inflammatory and antioxidant properties has been brought up in numerous works since antibiotic growth factors were discontinued. Of the well-known antioxidants and their cofactors, we can mention vitamin E and selenium.

Works have shown that a simultaneous addition of vitamin E and selenium influences the performances of chickens in animals suffering from stress. The immune status of chickens is improved, as is oxidative stability by a simultaneous addition of vitamin E and selenium.

Natural plant extracts have also been the subject of advanced research for their antioxidant and anti-inflammatory activities. The antioxidant and anti-inflammatory benefits of Curcuma are well documented. Scutellaria baicalensis is also described for its negative impact on the production of pro-

inflammatory cytokines. The joint use of the two plant extracts, Curcuma and Scutellaria baicalensis, in the feed of chickens under a salmonella challenged context helps to alleviate digestive inflammation in chickens and improve performances.

The present test aims to investigate the effect of this same combination of plant extracts on the growth and feed conversion of standard broiler chickens in a non-challenged context (experimental station). A comparison with an addition of antioxidants was included.

Material and methods

Three groups of eight replicates with four Ross 308 male chickens were fed during 35 days. The first group was fed with the control diets (starter, grower, finisher). The second group was fed with the control diets supplemented with the combination of vitamin E (100ppm) and selenium (0.2ppm).

The third group was fed with the control diets supplemented with the combination of plant extracts (Scutellaria and Curcuma).

Zootechnical performances (body weight, average daily gain, feed consumption and feed conversion ratio) were measured.

Results

In the context of this study, under non-challenged favourable experimental conditions (low density, favourable health context, etc), the supplementations very slightly impacted the growth of the chickens. This result supports the idea that the zootechnical effectiveness of the supplementations is dependent on the immune status of the animals.

The feed conversion (FCR) was statistically improved ($p=0.006$) during the starter and grower periods with the 'Scut+Cur' group (1.309) compared with the 'control' group (1.348), 'VitE+Se' group (1.326) being intermediate. This difference in favour of the 'Scut+Cur' group remained marked, but not signifi-

cant, until the end of the finishing period (FCR=1.602, 1.585 and 1.569 respectively in the 'control', 'VitE+Se' and 'Scut+Cur' groups).

The chicken response to the addition of antioxidants ('VitE+Se' group) was intermediate between the control group and the 'Scut+Cur' group, suggesting a lower impact of oxidative phenomena than inflammatory phenomena in young animals.

The 'Scut+Cur' supplementation significantly improved the feed efficiency of the chickens. An anti-inflammatory effect on the digestive mucosa and an indirect impact on the digestive microflora can be hypothesised, in line with Varmuzova et al., 2015. This study effectively highlighted the increase in favourable bacterial populations to digestive health in the caeca of chickens inoculated with Salmonella enteritidis and fed with 'Scut+Cur' combination. A decrease in activation of pro-inflammatory genes was also revealed.

The use of natural extracts of Scutellaria baicalensis and Curcuma favourably impacted the feed conversion of chickens in the starter/grower period.

This suggests that underlying inflammatory phenomena occur during the initial growth phase, even in a good health context.

Conclusion

Axion FeedStim is a natural feed additive dedicated to feed efficiency. It is composed of rigorously selected natural ingredients with antioxidant properties. It improves feed intake of broilers at challenging stages, such as heat stress.

The nutritional requirements for meat production can be better achieved and growth performances are optimised. Axion FeedStim contains plant extracts from Scutellaria baicalensis, which use is patented. Incorporated into complete broiler feed, the product has demonstrated its profitability with a 4:1 return on investment. ■

Table 1. Effect of supplementation of 'vit E+Se' or 'Scut+Cur' on chicken performance at 21 days.

	Control	VitE+Se	Scut+Cur	P
21 days				
End weight (g)	1041.5±20.3	1030.2± 20.3	1061.3±20.3	0.558
Average daily gain	47.7±0.97	47.2±0.97	48.7±0.97	0.558
1-21 days				
Average daily intake	64.4±1.2	62.5±1.2	63.7±1.2	0.526
FCR	1.348±0.008 ^a	1.326±0.008 ^b	1.309±0.008 ^a	0.006

References are available from the author on request