

Evaluation of a yeast extract product, containing a guaranteed range of β -glucans, in free range laying hens

M. MARIEN^{1*}, M. DE GUSSEM¹ and D. VANCRAEYNEST¹

¹Alpharma Animal Health, Laarstraat 16, B-2610 Wilrijk, Belgium.

*Corresponding author: maja.marien@alpharma.com

A trial was run to evaluate if the inclusion of Alphamune® (autolysed cells from *Saccharomyces cerevisiae*) in the feed ration of free-range laying hens improves performance.

One control house and one trial house, each with approximately 8,000 birds, were included in the trial. The hens in the trial house received Alphamune® in the diet at 500 g/ton from 16 weeks of age (point of lay) to 35 weeks of age. The performance of both groups of birds was monitored from 16 until 41 weeks of age by determining egg production, mortality, feed consumption, feed conversion ratio; egg quality, feather cover assessment (every two weeks from 20-29 weeks) and body weight (16-30 weeks). Both groups of birds suffered from an infectious bronchitis challenge at 25 weeks and from another unidentified illness at 34 weeks of age.

The birds on Alphamune® produced a higher number of total eggs and first quality eggs and a lower number of seconds. The main difference noted during the trial was that birds on Alphamune® recovered faster (feed consumption, egg mass and egg numbers) than control birds after the illness at 34 weeks, indicating the positive effect of Alphamune® on performance of laying hens.

Keywords: yeast cell wall; β -glucans; layers; performance

Introduction

A lot of research has been focusing on the development of products that improve the intestinal health of poultry. One of the products that proved to have a beneficial impact on the overall health of the gut of different species, including poultry, is a spray dried and granulated product called Alphamune®. It is produced after autolysis of a food grade yeast (*Saccharomyces cerevisiae*), and it contains a unique combination of (1-3,1-6) β -glucans (within a guaranteed β -glucan concentration range) and mannan oligosaccharides (mannans). The β -glucans, have been shown to be involved in the enhancement of the immune system due to their ability to bind to and activate macrophages (Huff *et al.*, 2007; Solis de los Santos *et al.*, 2007). The mannans on the other hand have a prebiotic effect: they act as a substrate and energy source for *Lactobacillus* spp. and in this way enhance the beneficial gut microbiota. Furthermore the mannans also act as a competitive binding site for certain Gram-negative bacteria such as *Salmonella* spp., prohibiting the attachment of the bacteria to the intestinal wall, helping in disease prevention (Van Immerseel *et al.*, 2004). There are many possible benefits of including Alphamune® in the feed ration, including a reduction in mortality, improvement of weight gain, body weight evenness and feed conversion rate.

Laying hens are very susceptible to disease challenges and the measures available for prevention and treatment are limited. For this reason a trial was run to evaluate if the inclusion of Alphamune® in the feed ration of free-range laying hens can give support and can improve bird performance.

Materials and Methods

The trial was run at two houses (each approximately 8,000 birds) of a free-range farm. House 1 was the control house (no supplementation in the feed) and house 2 was the trial house where Alphamune® was supplemented in the diet at 500 g/ton from 16 (point of lay) to 35 weeks of age. The two houses were separated from each other by approximately 500m. All birds were supplied by the same rearing farm and were managed in exactly the same way through the rearing and laying periods.

Throughout the trial period (from 16 weeks until 41 weeks) the performance of both groups of birds was monitored by determining egg production, mortality and feed consumption, egg quality (by determining the relative numbers of different types of second quality eggs), feather cover assessment (every two weeks from 20-29 weeks) and body weight and body weight evenness (16-30 weeks). Both groups of birds suffered from an infectious bronchitis challenge at 27 weeks and from another illness, which remained unidentified, at 34 weeks of age.

Results and discussion

At the end of the trial period (41 weeks), the Alphamune® fed birds produced a higher number of total eggs (124.87 eggs hen housed) than the control house (119.91 eggs hen housed) and a higher number of first quality eggs (seconds control house 8.2%, Alphamune® 7.8%). The results of the % egg production are presented in *Figure 1*. After the second disease challenge, production in the Alphamune® treated birds recovered faster in comparison to the control house.

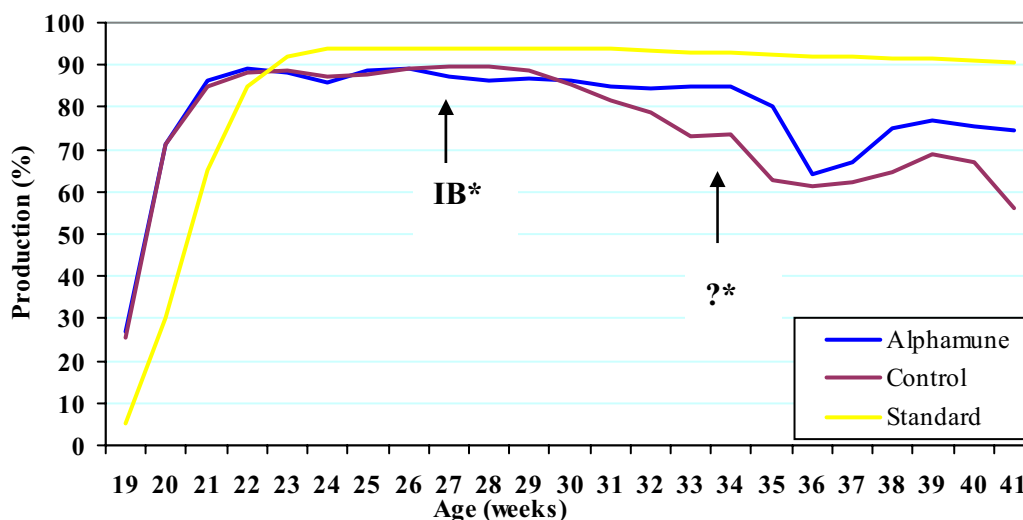


Figure 1: Egg production (%) throughout the trial period in the Alphamune® group, compared with the control group. Also the standard production is pointed out. *Black arrows represent the time where disease challenges occurred.

The egg mass (*Figure 2*) in the Alphamune® group never peaked as high as in the control house. Both houses showed similar egg mass until week 26. The Alphamune® houses egg mass fell for week 27 and 28. It then picked up a little and remained fairly constant until week 35 when egg mass fell dramatically once again due to illness. The control houses egg mass started to fall from week 29 to week 36 and started to slowly pick up again in week 37. Thus, the egg mass followed exactly the same trend as the egg production, with the egg mass recovering faster in the birds of the Alphamune® group after they suffered from an illness at 34 weeks.

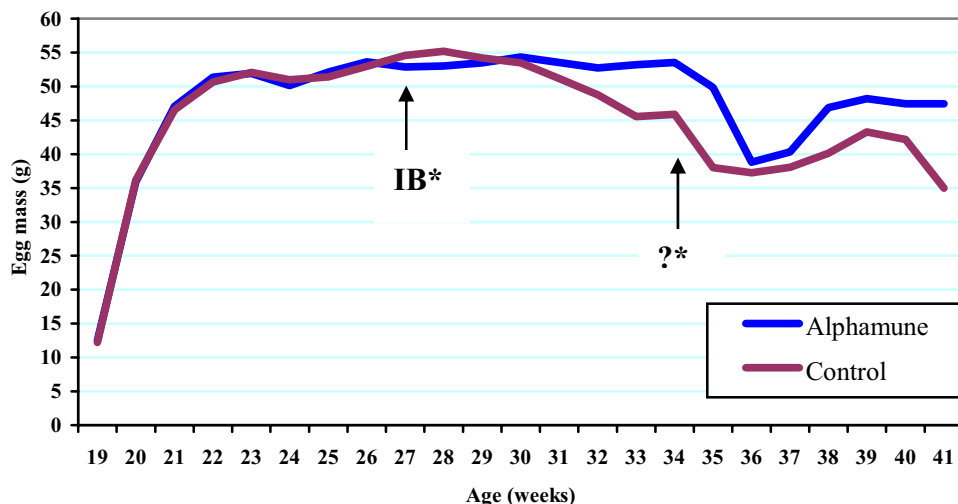


Figure 2: Egg mass (g) per hen housed throughout the trial period in the Alphamune® group, compared with the control group. Also the standard production is pointed out. *Black arrows represent the time where disease challenges occurred.

The number of seconds (mostly dirty eggs) was consistently higher in the control house and this showed a greater rate of increase during the disease challenges than in the Alphamune® treated house. Remarkably, the two illness periods had more effect on mortality in the Alphamune® group than in the control group. At 41 weeks, the cumulative mortality in the Alphamune® group had reached 6.05% compared with 2.70% in the control house. In spite of this higher mortality in the Alphamune group, performance on a hen housed basis was still better than the control group. The Alphamune® treated birds showed a slightly better overall body weight and body weight evenness compared with the control birds. No differences in feather cover were found between the two groups. The birds in the Alphamune® group ate more than the control house until 33 weeks when in the Alphamune® group feed consumption dropped a little so that the same quantity was eaten as the control house. In both houses, feed consumption dropped in weeks 24 and 34. Especially of importance was the fact that the feed consumption in the Alphamune® treated group recovered faster than the control house after they had been ill. Throughout the trial period, FCR in the Alphamune® fed birds was lower (ranging from 0.01 to 0.14 points lower than control) compared with the control group (except for at week 31, when FCR was 0.01 points higher). Feed intake was calculated on feed deliveries and estimated bin stocks and therefore becomes more accurate as the trial progressed.

Compared with the control group, the Alphamune® group produced a higher number of total eggs and first quality eggs and a lower number of second quality eggs throughout the trial period. The main difference noted during the trial was that birds that were fed Alphamune® recovered faster from the disease challenges at 27 and 34 weeks than the control birds. After challenge, feed intake of birds on the Alphamune® diet recovered faster, resulting in higher egg production (egg mass and number of eggs). Historical data regarding the two houses were compared in order to evaluate if there could be influence of a “house-effect”, but no indications of this were found.

Taking into account the additional cost of adding Alphamune® to the ration, the Alphamune® fed flock yielded a superior financial performance by the end of the trial period. The fact that performance differences in favor of Alphamune® persisted to 41 weeks, some 6 weeks after its use had concluded, is also noteworthy.

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