

The impact of aflatoxins on acquired immunity in poultry flocks

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Contamination by aflatoxins is an important issue on poultry farms, especially in countries located between both tropics (Cancer and Capricorn), such as Mexico. In these countries, contamination of raw materials (especially corn) can sometimes reach a very high level (more than 6,000ppb).

As with many other mycotoxins, aflatoxins have been proven to have a high negative impact on the bird's immune system, both on innate immunity, leading to lower production of lymphocytes (natural killer cells), or on acquired immunity, lowering or totally suppressing cell-mediated immunity.

On the other hand, Newcastle disease is also a major issue on broiler farms. In order to avoid this disease, most farmers vaccinate their flocks. Nowadays, when feeds are contaminated by aflatoxins, does the vaccination remain efficient to protect animals against Newcastle disease? Can an approved anti-mycotoxin solution also act on the immune system to better protect broilers?

In order to validate those hypotheses, Neovia worked with the University of the Guerrero States in Mexico. Some 144 male broilers were housed in groups of 16 broilers, all in the same house, until 42 days of age. The birds were in three feeding groups:

● **NC:** Negative control group. No contaminated feed. No T5X solution.

● **PC:** Positive control group. Feed contaminated by 1200ppb of aflatoxins. No T5X solution.

● **T5X group:** Feed contaminated by 1200ppb of aflatoxins, with T5X solution.

As a reminder, in Europe, complete feed for broilers can not contain more than 20ppb of aflatoxin B1 (EU 2001-466). In this trial, animals faced a contamination 60 times higher than this regulation!

The blood antibody titres of Newcastle disease (HI-ENC) were measured by inhibition of the haemagglutination technique at 21 and 42 days-old (broilers vaccinated at one day-old). The Newcastle disease antibody titre can be considered as a marker of the vaccine intake and thus a marker of the bird's immune status. In this trial, the immune depressive effect of aflatoxins on broilers is clearly seen (Fig. 1).

This HI-ENC titre is significantly ($p < 0.05$) higher in the blood of broilers fed with the antimycotoxin solution (T5X), compared to the positive control group (with aflatoxins), at both 21 and 42 days of age, demonstrating the beneficial effect of the product in case of high contamination of the feed with aflatoxins (vaccine response multiplied by 10 at 42 days of age). Moreover, the HI-ENC titre is significantly higher in the T5X group when compared to the negative control group (without aflatoxins), also both at 21 and 42 days of age.

These results support the concept of multi-component and multi-action anti-mycotoxin products. Acting directly on the

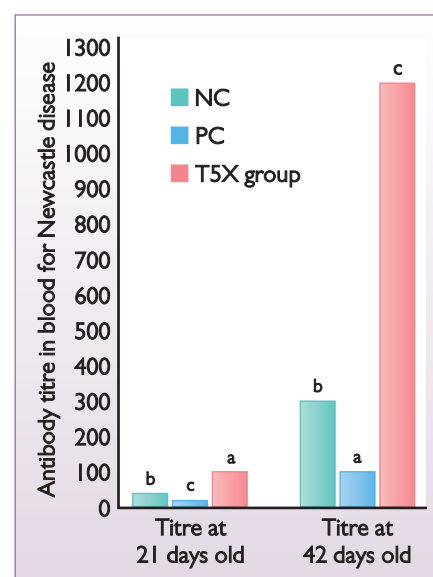


Fig. 1. The impact of aflatoxin contamination on Newcastle antibody titres in broilers and the effect of T5X ($p < 0.05$).

toxins (binding) is of course a key action. However, helping animals to counteract the negative effects of mycotoxins, and more precisely ensuring a good immune response at all stage proved to be an optimal strategy as highlighted in this trial. T5X is not only based on a thoroughly selected and efficient clay but also has three other synergistic actions. One of them precisely targets the support of the immune system. ■