

# Improved performance of broilers and layers with a premium mycotoxin binder in Africa

Mycotoxins are secondary metabolites produced by certain moulds (e.g., *Aspergillus*, *Fusarium* and *Penicillium*) and pose a serious challenge on the performance and health of different poultry species. Mycotoxicosis results in reduced feed intake and feed efficiency, as well as immune suppression, reduced egg production, hepatotoxicity, mortality and, consequently, economic losses.

There are different types of mycotoxins of importance for poultry production, with worldwide distribution. In Africa, the most commonly detected mycotoxins are aflatoxins (AF), trichothecenes (T-2, HT-2, DON), fumonisins (FUM) and zearalenones (ZEA).

Commercial feeds in Africa are normally produced and stored for a long time before being consumed by the birds. Poor composition of raw materials, moisture in feeds and high temperatures in most countries during most parts of the year very often lead to mould and mycotoxin contamination.

Mycotoxins can occur individually or in combination (co-occurrence), causing synergistic, additive or antagonistic effects. Most poultry feeds in Africa are contaminated with multiple mycotoxins. Therefore, it is recommended to prevent mycotoxicosis.

Commercial mycotoxin binders are primarily based on adsorbents (binding of mycotoxins in the intestinal tract). Some mycotoxins, the high-polar ones (AF, FUM) are easily bound by clays. The non-polar mycotoxins (ZEA) can be bound by yeast-derived products. However, complete adsorption of some mycotoxins (e.g. trichothecenes) is not possible. Therefore, to prevent the growth of mould in stored feed, to tackle the occurrence of difficult binding mycotoxins and, thereby, to protect tissues impaired

by mycotoxicosis (e.g. liver and intestine), a broad spectrum solution is advisable.

**Excential Toxin Plus (ETP)** is one of the best mycotoxin binding mixtures, consisting of five synergistically working ingredients, with inhibition of mould growth, adsorption properties, support of intestinal integrity and hepatoprotection.

With the aim to evaluate the effects of ETP on the performance of broilers (Senegal) and layers (Togo), two studies were conducted by Orffa in collaboration with two universities in Africa.

## The mycotoxin binder improves the zootechnical performance of broilers – a study in Senegal

A 42-day study was conducted in collaboration with the School of Veterinary Medicine of the University of Dakar, using a total of 600 day-old Cobb 500 broilers. The birds were fed a corn-groundnut-meal-based diet. Feed and water were provided *ad libitum*. The experiment was divided into two periods: day 0 - 10 (adaptation) and day 11 - 42 (experiment). On day 11, the birds were

**Table 1: Zootechnical performance of broilers during days 0 - 42 when supplemented with different dosages of a mycotoxin binder**

	Control	1 kg/t ETP	5 kg/t ETP
Body weight, kg	1.97 <sup>x</sup>	2.02 <sup>y</sup>	1.96 <sup>x</sup>
Average daily gain, g/d	55.3	57.5	55.5
Average daily feed intake, g/d	143.0	140.4	139.8
Feed conversion ratio, kg/kg	2.520	2.380	2.420

ETP = Excential Toxin Plus, Row with different superscript<sup>(x,y)</sup> tended to differ ( $p < 0.1$ ).

**Table 2: Effect of a toxin binder on performance and egg parameters of hens in different ages**

	Old hens		Young hens	
	Control, T1	ETP, T2	Control, T3	ETP, T4
<b>Performance</b>				
Average daily feed intake, g/d	112.5	110.9	112.5	110.1
Egg production rate, %	64.5 <sup>a</sup>	70.1 <sup>b</sup>	70.1 <sup>b</sup>	71.8 <sup>b</sup>
Feed conversion ratio, kg/kg	2.881 <sup>b</sup>	2.615 <sup>a</sup>	2.642 <sup>b</sup>	2.520 <sup>a</sup>
<b>Egg parameters</b>				
Egg weight, g	59.4	63.4	59.0	60.8
Yolk weight, g	15.2	15.6	15.5	15.4
Albumen weight, g	36.3 <sup>a</sup>	39.6 <sup>b</sup>	35.6 <sup>a</sup>	37.6 <sup>ab</sup>
Shell weight, g	7.9 <sup>a</sup>	8.5 <sup>b</sup>	7.9 <sup>a</sup>	7.7 <sup>a</sup>

ETP = Excential Toxin Plus, Row with different superscript (<sup>a</sup>,<sup>b</sup>) differ significantly ( $p < 0.05$ ).

randomly assigned to one of the three treatments (four pens/treatment, 50 birds/pen) according to the content of ETP in the feed (0.1 or 5 kg/ton). The supplemented groundnut meal was selected based on its high aflatoxin concentration (160.4 µg aflatoxin/kg). Supplementation of 1 kg/t of ETP resulted in an improvement of +2.4% in final body weight ( $p < 0.1$ ) and -5.6% in feed conversion ratio (FCR) (Table 1). The high dosage of the mycotoxin binder (5 kg/t) did not affect final body weight but reduced FCR by -4.0%. It is expected that in commercial circumstances, where the levels of AF in the feed are higher and different mycotoxins co-occur, the effects of ETP will be more apparent.

### Laying performance is improved with supplementation of a mycotoxin binder – a study in Togo

A total of 840 Isa Brown old (62 - 74 weeks) and young (47 - 59 weeks) laying hens, with an average body weight of 1.75 kg, were used in a 12-week study conducted in collaboration with the Regional Centre of Excellence in Avian Sciences (CERSA, University of Lomé). The hens were fed a corn-soybean-based diet. Feed and water were provided *ad libitum*. The first four weeks of the study the hens were allowed to adapt. From week five, the hens were randomly assigned to one of the four treatments (six pens/treatment, 35 hens/pen): T1, young hens control; T2, as T1 + 1.5 kg/t ETP; T3, old hens control; T4, as T3 + 1.5 kg/t ETP. Compared to the controls, supplementation of 1.5 kg/t of ETP resulted in significantly improved egg production, especially

in old hens (+8.7% ( $p < 0.05$ ); +2.4% for young hens), and significantly reduced FCR for both old (-9.2%) and young (-4.6%) hens (Table 2). In old hens, ETP improved egg weight by +4.0g, due to a significant improvement in albumen and shell weight ( $p < 0.05$ ; Table 2).

The production of mycotoxins is related to environmental conditions and vary from year to year. Environmental conditions on the African continent encourage the proliferation of mould species, with mycotoxins having been identified as contaminants of crops before harvest, as well during harvest and storage. Furthermore, co-occurrence of mycotoxins in poultry feed seems to be common in Africa, posing a higher risk of negative effects on the health and productivity of poultry. Given the absence of sophisticated monitoring of mycotoxins in some African countries and considering that contaminated feed removal is not an economical solution, the inclusion of a mycotoxin solution to adsorb the mycotoxins and alleviate their effects in the birds seems to be the best option.

*\*References available on request*

**For more information, contact:**  
**Giseli Heim**  
**Team Leader Central**  
**Technical Management**  
**E-mail:**  
**heim@orffa.com** 

