EFFECT OF A LIQUID ANTI-MYCOTOXIN SOLUTION IN REDUCING THE RELATIVE ABUNDANCE OF TENUAZONIC ACID MYCOTOXIN IN THE LIVER OF BROILER CHICKENS

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INTRODUCTION

The analysis of mycotoxins in feed is a promising tool for identifying and quantifying the mycotoxin challenge that animals face. Additionally, the **characterization** of **mycotoxin biomarkers in biological matrices** such as liver offers **precise and valuable insights** into their **actual exposure**. **Mycotoxin contamination** can severely **affect vital organs** and **animal antioxidant status**, requiring the use of **anti-mycotoxin solutions** to **counteract their effects**. The solutions that contain natural extracts with a high antioxidant capacity, are introduced as new nutritional strategies for the mitigation of the mycotoxin's detrimental effects in animal nutrition.

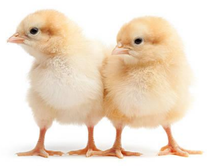
OBJECTIVE

The aim of the present study was to evaluate the efficacy of a novel liquid anti-mycotoxin solution (LS) administered through drinking water, based on a specific combination of natural extracts from grape and olive (*Vitis Vinifera* and *Olea Europaea*), on the hepatic bioavailability of mycotoxin biomarkers and the antioxidant status in broilers chickens.

MATERIALS AND METHODS

Experimental design

T1



Broilers chickens
(n = 22,950)/ **3** repetitions

T2

Broilers chickens
(n = 23,256)/ **3** repetitions

T1: *naturally multi-contaminated diet*
T2: *naturally multi-contaminated diet + 0.5 mL LS/L of drinking water*

- **46.206 broiler chickens (Ross 380)**
- **Duration of the study: 42 days**
- **Blood samples of 15 broiler chickens at day 35**

	Contaminated diet (ppb)
Aflatoxin B1 (AFB1)	3.15
Fumonisins (FBs)	390.5
Ochratoxin A (OTA)	0.99
Deoxynivalenol (DON)	172.5
Zearalenone (ZEN)	80.9
Toxin T-2/HT-2 (T-2/HT-2)	53.2

- *Analysis perform by lateral flow strip kits supplied by ProGnosis Bio-tech (Larissa, Greece)*
- *Tenuazonic acid (TeA) was not determined in feed*

PARAMETERS

Mycotoxin biomarkers analysis in liver*:

- 400 metabolites

Production parameters:

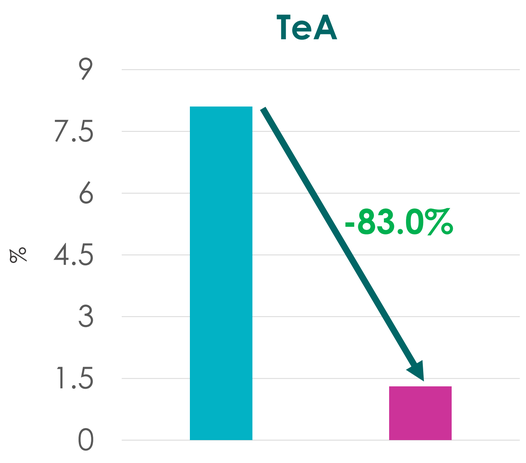
- Feed conversion ratio (FCR)

Oxidative stress biomarkers:

- Thiobarbituric acid reactive substances (TBARS)
- Total antioxidant capacity (TAC)
- Protein carbonyls (CARBS)

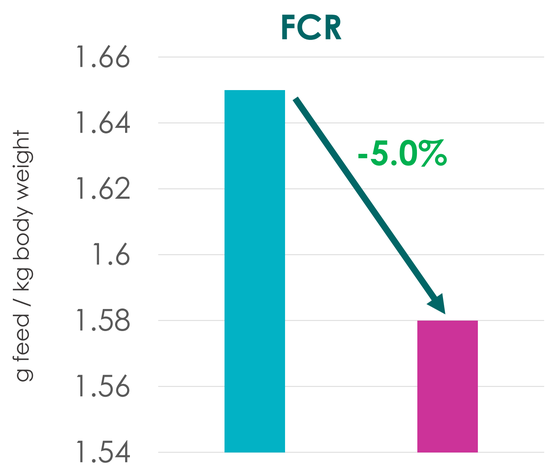
** HPLC-QTOF: ultra-high-performance liquid chromatography-tandem mass spectrometry with a quadrupole-time-of-flight analyzer*

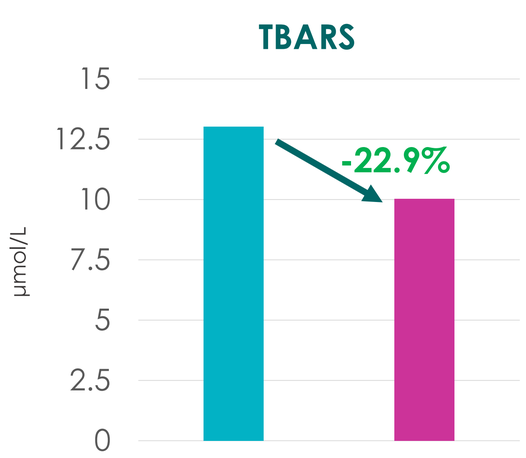
RESULTS

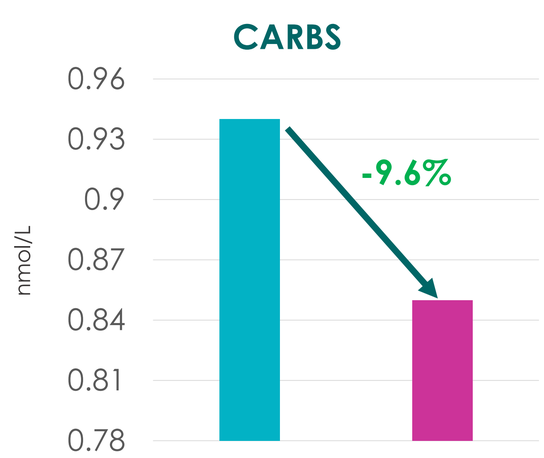


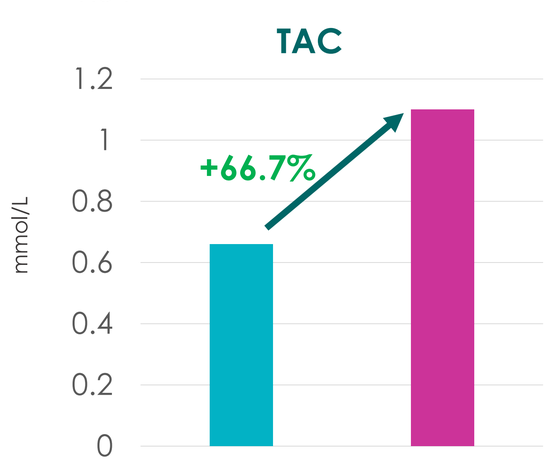
T1: Naturally multi-contaminated diet

T2: Naturally multi-contaminated diet + 0.5 mL LS/L of drinking water









CONCLUSIONS

The results demonstrate that the **liquid anti-mycotoxin solution (LS)** stimulates the hepatic detoxification of **TeA**, **increases** the **antioxidant cellular capacity**, which contributes to **enhanced flock health**, provoking an **improvement** in the **productivity** as is observed in the increase of **FCR**. Therefore, the **liquid anti-mycotoxin solution (LS)**, formulated with **grape and olive extracts**, effectively **mitigates mycotoxin exposure** and their **harmful effects on health**.