

MYCOAD

All efficacy claims are based on scientific *in vivo* trials with statistical significance on

Target  rgan Protection



**Anti-Mycotoxin
Additive**

INTRODUCTION

Ducks are considered one of the most susceptible avian species to aflatoxin (AFLA) toxicity. Scientific reports describe several clinical signs and lesions, as well as diminished performance after ingestion of contaminated rations for different periods of time. Some of the symptoms described include high and rapid mortality in young birds, loss of appetite, retarded growth, hemorrhage in the web-toe, and nervous symptoms such as ataxia and opisthotonus (crooked neck). The main lesions reported are enlarged, fatty, pale, yellowish, friable, cirrhotic, hemorrhagic, and/or jaundice livers. Also, atrophy of the main organs of the immune system (Bursa of Fabricius, thymus), petechial hemorrhages in muscles, malabsorption syndrome and steatorrhea (fat in feces) has been described.

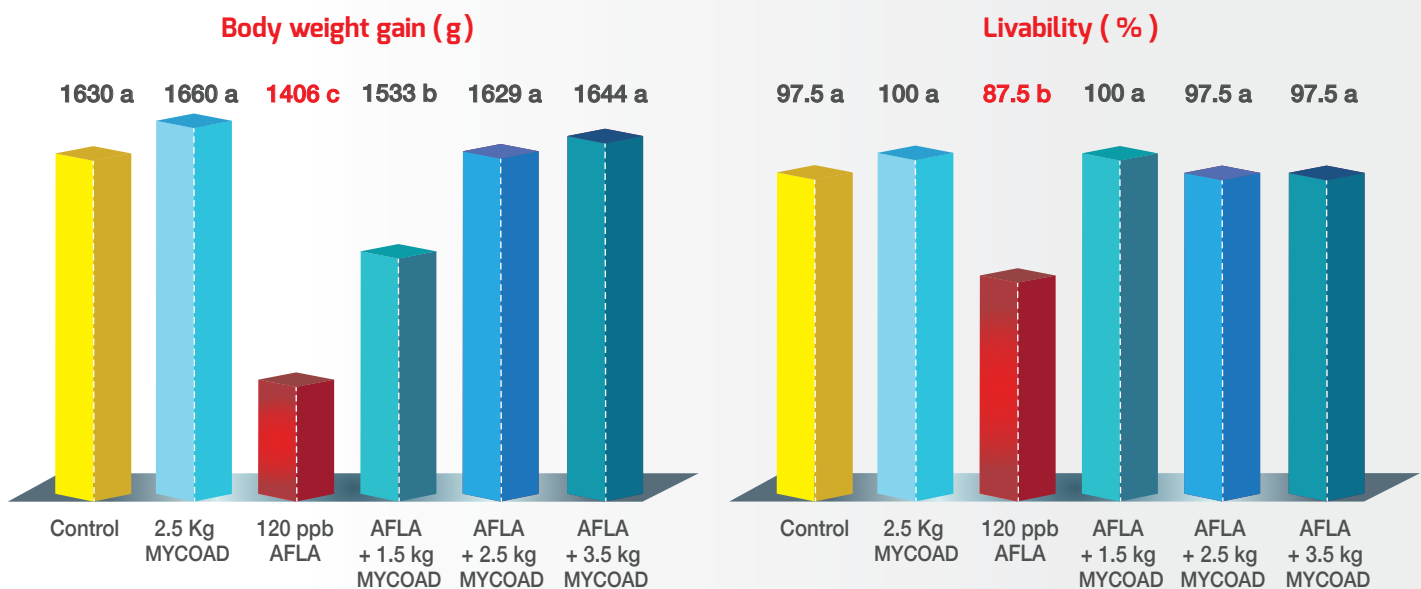
An experiment was conducted to evaluate the efficacy of different levels of **MYCOAD** in ameliorating the deleterious effects produced by the ingestion of natural AFLA and to demonstrate the innocuity of **MYCOAD** when added to a diet.

PROTOCOL

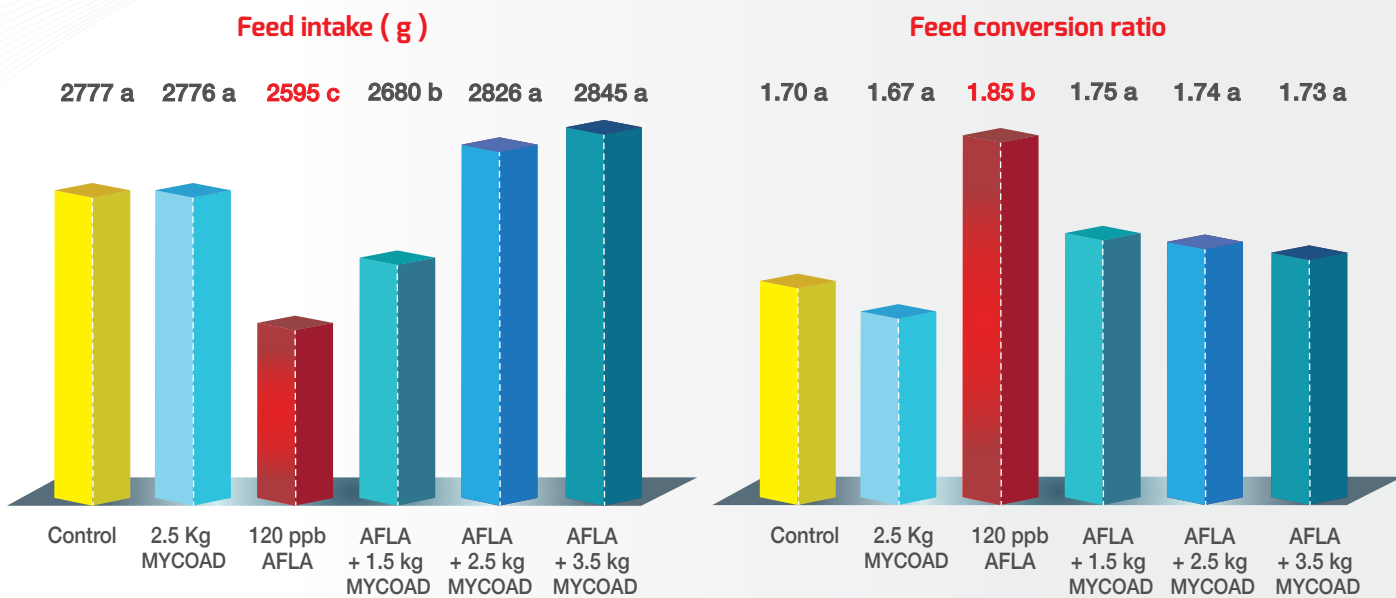
The experiment was conducted at Khon Kaen University's Poultry Research Farm in Thailand. Before the start of the trial all the ingredients used to prepare the rations were analyzed for detection of AFLA. Corn naturally contaminated with AFLA was mixed with aflatoxin-free corn until the intended concentration of AFLA was present in the test diets. One-day-old meat-type ducks (Cherry Valley) were randomly distributed into 6 dietary treatments with 2 replications (pen) of 20 birds each. All birds were housed in concrete-floored pens under continuous lighting throughout the 4-week duration of the experiment and they had *ad libitum* access to feed and water. At the end of the trial, performance was evaluated and all ducks were euthanized for further evaluations.

PERFORMANCE

Effect of **MYCOAD** and aflatoxin in 4 week-old ducks



a, b, c, Means without a common letter differ significantly ($P < 0.05$)



a, b, c, Means without a common letter differ significantly (P<0.05)



— ORGANS —

Effect of **MYCOAD** and aflatoxin on the relative weight of different organs of 4 week-old ducks

Treatment	Heart % BW	Pancreas % BW	Kidneys % BW	Spleen % BW
Control	0.57 a	0.39 a	0.90 a	1.11 a
Control + 2.5 kg MYCOAD	0.57 a	0.38 a	0.89 a	1.10 a
120 ppb AFLA	0.71 b	0.49 b	1.52 b	1.21 b
120 ppb AFLA + 1.5 kg MYCOAD	0.63 ab	0.44 ab	1.10 ab	1.13 a
120 ppb AFLA + 2.5 kg MYCOAD	0.59 a	0.42 ab	0.96 ab	1.12 a
120 ppb AFLA + 3.5 kg MYCOAD	0.58 a	0.41 ab	0.92 ab	1.12 a

a, b Means within a column without a common letter differ significantly (P<0.05)

— CHRONIC TOXICITY —

Feather growth score



1 = Poor

2 = Moderate

3 = Good

Web-toe hemorrhage score



0

0.5

1

1.5

2

Normal

Mild

Moderate

Marked

Severe

Treatment	Feather growth	Web-toe hemorrhage	Eye necrosis	Tibial bone porosity	Leg deformities
Control	2.71 a	0.07 a	1.03 ab	1.08 b	0.49 a
Control + 2.5 kg MYCOAD	2.74 a	0.06 a	1.01 a	1.03 a	0.45 a
120 ppb AFLA	1.69 d	0.50 d	1.85 d	1.70 e	1.81 c
120 ppb AFLA + 1.5 kg MYCOAD	2.43 c	0.25 c	1.43 c	1.25 d	0.70 b
120 ppb AFLA + 2.5 kg MYCOAD	2.52 bc	0.17 b	1.17 b	1.17 c	0.61 ab
120 ppb AFLA + 3.5 kg MYCOAD	2.63 ab	0.15 b	1.10 b	1.14 c	0.56 ab

a, b, c, d, e Means within a column without a common letter differ significantly ($P < 0.05$)

Eye necrosis score



①

Normal

②

Moderate

③

Severe

Tibial porosity score
fresh bone silver nitrate drip



Leg deformities score

①

Normal

②

One leg slightly deformed

③

Both legs slightly deformed

④

One leg slightly deformed, the other severely deformed

⑤

Both legs severely deformed

LIVER TOXICITY

Effect of **MYCOAD** and aflatoxin in the liver of 4 week-old ducks

Treatment	Liver % body weight	Liver paleness score	Liver % fat content
Control	2.31 a	1.10 a	16.0 a
Control + 2.5 kg MYCOAD	2.26 a	1.09 a	15.8 a
120 ppb AFLA	2.85 c	1.87 d	22.4 c
120 ppb AFLA + 1.5 kg MYCOAD	2.60 ab	1.36 c	17.6 b
120 ppb AFLA + 2.5 kg MYCOAD	2.43 a	1.29 bc	16.8 ab
120 ppb AFLA + 3.5 kg MYCOAD	2.40 a	1.19 ab	16.5 a

a, b, c, d Means within a column without a common letter differ significantly (P<0.05)

Liver paleness score

Normal



Moderate



Severe



INNOCUITY

Ducks receiving the control diet with the addition of 2.5 kg of **MYCOAD** demonstrated no interference with nutrient absorption.

- A significant reduction in bone porosity, demonstrating improvement of bone structure when using **MYCOAD**.
- A consistent 2% improvement in performance and livability when using **MYCOAD**.
- Relative organ weights or characteristics showed no significant differences when using **MYCOAD**.

CONCLUSIONS

Feeding a diet naturally contaminated with 120 ppb AFLA to ducklings for the first 4 weeks of life significantly affected performance, liver characteristics, relative organ weights, and increased mortality. Significant damages were detected in feathers, web-toe, eyes, legs and bones.

- 1.5 kg/mt of **MYCOAD** significantly improved performance, reduced mortality, and prevented the damages caused by AFLA in the organs evaluated.
- 2.5 kg/mt of **MYCOAD** completely recovered performance and fully protected the organs from AFLA.
- 3.5 kg/mt of **MYCOAD** offered no further protection.

MYCOAD at 2.5 kg/mt was effective in preventing the toxic effects of aflatoxin in ducklings, and when fed alone, not only did it not affect the organs size, but even improved performance and bone structure.

Reference: Wongtangtintharn, Sawitree; Bundit Tengjaroenku; Jowaman Khajarn, and Douglas Zaviezo. Efficacy of an anti-mycotoxin additive in preventing the toxicity of aflatoxin in ducks. XXV World's Poultry Congress. September 2016. Beijing, China (to be published).

MYCOAD

**Does your anti-mycotoxin additive
meet the basic TOP and FACTS?**

Target Organ Protection

Mycotoxin	Organ	MYCOAD	MYCOAD AZ
Aflatoxin	Liver	YES	NO
Ochratoxin	Kidney	YES	NO
T-2 Toxin	Oral lesion	YES	YES
Fumonisin	Heart / Lung / Liver	YES	YES*
Zearalenone	Reproductive	N/A	YES
DON	Liver	N/A	YES

Facts	MYCOAD	MYCOAD AZ
<i>In vivo</i> dosage with TOP results	2.5 kg / MT	1 kg / MT
Recommended commercial dosage	2.5 kg / MT	1 kg / MT
The clay is always obtained from the same mine	YES	YES
Approved in Texas, USA, against Aflatoxin	YES	N/A
Approved in the European Union against Aflatoxin. Regulation #1831 / 2003 (1m 588)	YES	N/A
ENDOTOXIN adsorption	N/A	YES
Efficacy approved by LAMIC and other institutions against the following number of mycotoxins	4	4
Efficacy approved by LAMIC and other institutions in different types of animals	6	5
Nutrient absorption	NO	NO
<i>In vitro</i> efficacy test every:	100 MT	18 MT

* Test performed with 4 Kg / MT with 30,000 ppb of fumonisin
N/A= not applicable

Mycoad = Cobind, Toxfree Standard
Mycoad AZ = Cobind AZ, Toxfree



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THE MYCOTOXINS SPECIALIST
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