

Effect of supplementing MMDA on performance, carcass variables, immune responses, and liver function variables in broiler chicken fed known concentrations of aflatoxin, DON, and T-2 toxin

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INTRODUCTION

- Mycotoxins are ubiquitous and their presence is common in poultry feed.
- Mycotoxins reduce feed utilization, weight gain, and immune responses, and may cause mortality.
- Combined mycotoxins (MT) cause severe losses in the poultry industry.
- Broad spectrum toxin binder will minimize the negative effects of combined mycotoxins.

MATERIALS AND METHODS

- A multicomponent mycotoxin detoxifying agent (MMDA - containing selected minerals, Bacillus sp, silymarin, yeast cell wall extract) was fed to diets having combined mycotoxins (aflatoxin B1 100 ppb, DON 200 ppb and T-2 1000 ppb).
- Six dietary treatments in a 2 (without and with MT × 3 (0, 1.5 and 3.0 kg/ T MMDA) factorial design with 12 replicates (22 birds/rep) were placed in floor pen.
- Trial duration 1:42d of age.
- Broiler (Cobb 400) male chicken.

RESULTS

- The MT significantly reduced the antibody titers against Newcastle disease vaccine (5.8 vs 7.2 log 2) and increased the liver weight (21.5 vs 16.11 g/kg live weight).
- Supplementation of MMDA marginally improved ND titers (6.3-6.6 log 2).
- MMDA significantly decreased the activities of SGOT (191-199 units/L), and SGPT (15.21-13.87 units/L) and GGT (32.03-35.59 units/L).

- The concentrations of aflatoxin B1, B2, G1, G2 and M1, T-2, HT-2, T2 Triol, T2 Tetraol, Deoxynivalenol and DOM1 in the tissue were below detectable levels.

CONCLUSION

- Supplementation of the broad-spectrum MMDA (1.5 kg/T) to the combined mycotoxin-contaminated diet reduced the negative effects on immune responses and liver function enzymes in broiler chicken.

Table

Effect of supplementing MMDA on immune responses and serum biochemical variables in broiler chicken challenged with MT

Interaction		Immunity		Serum variables					
MT	MMDA	CMI	ND Titre	SGOT	SGPT	GGT	TP	ALB	TG
		%	Log2	Units/L			g/dL		Mg/dL
Nil		63.3	6.83 ^A	206 ^B	13.5B	36.8	4.30	2.35 ^A	59.95
Yes		62.3	6.23 ^B	238A	16.7 ^A	41.9	4.30	2.23 ^B	59.28
	0.0 g/kg	65.3	6.50	254A	17.3A	49.1B	4.35	2.32	61.12
	1.5 g/kg	65.3	6.85	203B	14.5B	37.9AB	4.22	2.26	59.95
	3.0 g/kg	57.7	6.25	211B	13.5B	31.1B	4.32	2.29	57.76
N		10	10	10	10	10	10	10	10
SEM		2.455	0.125	8.835	0.613	2.870	0.094	0.030	1.060
MT		NS	**	*	**	NS	NS	*	NS
MMDA		NS	NS	**	*	*	NS	NS	NS

MT- Aflatoxin 100 ppb, DON 200 PPB & T2 1000 ppb toxins; CMI cell-mediated immune response; ND Newcastle disease; SGOT serum glutamic-oxaloacetic transaminase; SGPT Serum glutamic pyruvic transaminase; ALP alkaline phosphatase; GGT gamma-glutamyl transferase; TP total protein; AL albumin; TG triglycerides; P probability; N number of replicates; SEM standard error mean; NS Non-significant, * significant; ** highly significant.

ABC means having common superscripts in a column do not vary significantly (P<0.05).