

## EFFECTIVENESS OF MYCODOTE\* FOR DETOXIFICATION OF AFLATOXIN CONTAMINATED LOCAL CHICKEN DIETS

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### **Abstract**

Two local strains of chickens Gimmizah (G) and Dokki-4 (D<sub>4</sub>), at age of 48 weeks were used in this study. Ninety- six individuals of each strain (90 hens + 6 cocks) were distributed randomly into 6 groups for each strain to present three levels of aflatoxin B<sub>1</sub> (AFB<sub>1</sub>) 0.0, 2 and 5 ppm. Within each of AFB<sub>1</sub> groups, two levels of mycodote as antitoxin 0.0 and 0.01% were added. Birds of both strains were exposed to toxin and toxin plus mycodote for three weeks (treatment period). Thereafter, they were fed for 4 weeks on free aflatoxin and mycodote diets (recovery period).

Results of overall means were determined and summarized as follows:

1. There was slight increase in the concentration of ALT(Alanine aminotransferase), alkaline phosphates (ALP) and creatinine enzymes for those fed contaminated diets. Plasma total protein, albumin, and globulin concentration showed slight decrease during treatment period.

2-The treated groups fed on AFB<sub>1</sub> without mycodote had significantly higher aflatoxin residue in egg yolk than in albumen. Slight effect lasted till the end of the recovery period for birds.

3-The liver contained the highest levels of aflatoxin residues compared to the spleen, heart, breast, gizzard and thigh tissues.

4-The two local breeds showed different and promoting effect in effecting aflatoxicosis.

However, administration of mycodote ameliorated the negative effect of aflatoxin B<sub>1</sub> in the diet. Also, the recovery period for four weeks was not sufficient to bring the birds to normal production activity.

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\* Mycodote ®: adsorbent agent hydrate sodium, calcium alumionsilicate (HSCAS).

## INTRODUCTION

Aflatoxins are the secondary metabolites which are produced mostly by certain species of *Aspergillus flavus* and *Aspergillus parasiticus* (Peers and Linsell, 1997). These compounds contaminate various food and feed products and they threaten animal and human health. Aflatoxin has elicited the greatest public health concern of all mycotoxins because of its widespread occurrence in several feed grains, especially corn which comprises between 50 to 60% of many poultry diets (Phillips *et al.* 1988). Additionally, liver damage characterized by enlargement and of enzymes aspartate aminotransferase (AST) and alkaline phosphates (ALP) in the blood has been reported in pigs fed 500 ppb aflatoxin (Harvey *et al.* 1990). Harvey *et al.* (1989) reported on protection from changes in serum biochemical measurements that were caused by consumption of diet containing 3 mg of AF<sub>1</sub> per kg diet in growing Leghorn chicks. The highest amounts of AF residues were detected in the liver followed by breast, muscles finally for egg content, in an experiment, where, laying hens received diets containing maize naturally contaminated with 150 and 750 ug / kg aflatoxin B<sub>1</sub> for 3 and 6 weeks, respectively (Rizk *et al.*, 1993).

Residues of aflatoxin B<sub>1</sub> had been found in eggs and tissues from hens and broilers fed on aflatoxin contaminated ration by methods capable of detecting aflatoxin (M<sub>1</sub>) and (B<sub>1</sub>) (Truchsess *et al.*, 1977).

The study was conducted to investigate the effect of AFB<sub>1</sub> with or without Micodote on blood parameters, aflatoxin residues in tissues and egg.

## MATERIALS AND METHODS

A total of 192 chicken birds of Gimmizah (G) and Dokki-4 (D<sub>4</sub>), local strains, at 48 weeks of age were used. Ninety-six birds of each strain (90+6 cocks) were wing-banded, weighed and randomly distributed into three experimental groups with 2 replicates (15 hens+1 cock). The birds were housed in floor pens. All experimental groups were fed on basal diet for 4 weeks before experimental treated period.

The experimental diet was formulated with two levels aflatoxin B<sub>1</sub> (2 and 5mg / kg diet) only and other diets containing 0.1% Mycodote (antitoxin). Hens were fed on the experimental diets for 3 weeks as treatment period, then, they were fed on free aflatoxin diet for 4 weeks as a recovery period, to study the withdrawal time required for bringing back the flock to the normal production. Aflatoxin was produced via

fermentation of rice by *Aspergillus flavus* NRRL 2999 as described by Shotwell *et al.* (1966). Fermented rice was autoclaved, dried and ground to a fine powder which was analyzed spectrophotometrically for its aflatoxin content by method of Nabaney and Nesbitt (1965). Aflatoxin in the rice powder was extracted by chloroform, then incorporated into the basal diet and confirmed by TLC to provide the desired levels of 2 and 5 mg aflatoxin B<sub>1</sub> / kg diet. At the end of every week, three hens from each treatment of each strain were randomly selected, weighed and slaughtered. Parts of breast, thigh and organs were subjected to chemical analysis for determination of aflatoxin residues in tissue and organs. Egg (yolk and albumen) were also examined to detect aflatoxin content. Serum concentration of aspartate aminotransferase (AST), alanine aminotransferase (ALP), alkaline phosphatase, creatinine total protein, albumin and globulin were determined on a clinical chemistry analyzer. Data for all traits were statistically analyzed according to one way analysis of variance design using general linear model (GLM) procedure by computer program of SAS (1985) as the model

$X_{ij} = M + A_i + e_{ij}$ . where:

$X_{ij}$  = represents observation,                       $M$  = overall means

$A_i$  = effect of treatments (diets)

$e_{ij}$  = experimental error.

## RESULTS AND DISCUSSION

Data presented in Tables 1 and 2 indicated that, at the end of the treatment period, there was a high decrease for AST values by aflatoxin increasing from 2 to 5 ppm, while, there was significantly ( $P < 0.05$ ) higher ALT for treated groups fed on aflatoxificated diets with or without mycodote. On the other hand, hens fed aflatoxificated diets with 0.1% mycodote showed a slight improve in plasma AST of birds suffering from aflatoxin 2 ppm in their diet more than those received contaminated diet with 5 ppm aflatoxin B<sub>1</sub>. In this respect, Coles (1986) reported that, most increases in plasma (ALT) activity are associated with hepatocellular damage and also, when cellular degeneration or destruction occurred in liver cells. The increase of ALT level during aflatoxicosis may be due to the effect of aflatoxin on the permeability of the liver cell which causes liver cell death (Hess, 1962).

Also, there was a high ( $P < 0.05$ ) increase in (ALP) for hens fed on aflatoxicated diets without micodote. The increasing of (ALP) activity could be a result of damage of liver cells and bile duct obstruction due to proliferation of its cells (Newberne and Butler, 1969), while; there was significant ( $P < 0.05$ ) increase in plasma creatinine concentration for birds fed aflatoxicated diet (5ppm AFB<sub>1</sub>) (Hegazi, 1988).

Results in the same tables revealed that there was significant ( $P < 0.05$ ) decrease in plasma total protein and albumin concentration of aflatoxicated groups for G and D<sub>4</sub> hens. On the other hand, there were some improve in plasma total protein and albumin concentration for birds fed detoxificated (0.01% mycodote) diet. A decrease in plasma albumin may have resulted commonly in association with chronic hepatic disease (Coles, 1986).

The increase and decrease of total globulins content may be due to the metabolism of aflatoxin in liver and the effect of aflatoxin on protein synthesis and RNA production resulting in decreasing albumin and B- globulins, and increased  $\gamma$ -globulins (Osuna and Edds, 1982). It was noticed in this study, that at the end of recovery period, all treated groups fed aflatoxin contaminated diet caused improvement for all blood parameters except ALT, ALP and creatinine, while the groups fed aflatoxin contaminated diet alone (without mycodote) contained effective amount of most blood parameters (AST, ALT, PLP and Creatinin).

**Aflatoxin residue in egg components:** Data in Tables 3 and 4 indicated that, the birds fed aflatoxicated diets without additives deposited the highest amount of AFB<sub>1</sub> in their egg yolk and albumen while, aflatoxicated diets plus mycodote combination decreased residues of AFB<sub>1</sub> in egg yolk and albumen for G and D<sub>4</sub> strain. These results are in agreement with those obtained by Iqpal *et al.* (1983).

**Aflatoxin residue in hens tissues:** The liver was observed to have the highest level of aflatoxin which, inturn, may cause hepatitis or necrosis or cirrhosis or fatty degeneration, and lead to the hens death, while, the withdrawal of aflatoxin from diet decreased the amount of toxin in tissues (Tables 5 and 6). These results are in a harmony with those obtained by Hegazy and Edris (1991).

Table 1. Effect of antitoxin (Mycodote) as detoxification agent for aflatoxin B<sub>1</sub> on blood picture of Gimmizah hens during treatment (0-3 weeks) and recovery (4-7 weeks) periods.

Items	Treatment period (Start to 3 weeks)						Recovery period (4-7 weeks)					
	AF level ( ppm)						AF level ( ppm)					
	0		2		5		0		2		5	
	Mycodote %						Mycodote %					
	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1
AST*	283.7 <sup>b</sup>	291.5 <sup>a</sup>	235.2 <sup>d</sup>	239.7 <sup>c</sup>	222.5 <sup>e</sup>	231.6 <sup>d</sup>	278.1 <sup>a</sup>	294.7 <sup>a</sup>	249.2 <sup>a</sup>	256.1 <sup>b</sup>	232.0 <sup>c</sup>	247.1 <sup>bc</sup>
ALT*	98.4 <sup>c</sup>	87.5 <sup>c</sup>	118.3 <sup>b</sup>	116.2 <sup>b</sup>	132.7 <sup>a</sup>	126.3 <sup>ab</sup>	102.3 <sup>c</sup>	92.6 <sup>c</sup>	113.7 <sup>cb</sup>	108.8 <sup>b</sup>	130.2 <sup>a</sup>	115.6 <sup>b</sup>
Alkaline-Ph**	33.2 <sup>a</sup>	33.9 <sup>a</sup>	35.4 <sup>b</sup>	37.6 <sup>a</sup>	41.7 <sup>a</sup>	38.1 <sup>a</sup>	25.9 <sup>a</sup>	27.8 <sup>a</sup>	31.5 <sup>a</sup>	30.8 <sup>a</sup>	37.7 <sup>a</sup>	33.8 <sup>a</sup>
Criatinine**	1.47 <sup>a</sup>	1.46 <sup>a</sup>	1.52 <sup>a</sup>	1.50 <sup>a</sup>	1.57 <sup>a</sup>	1.54 <sup>a</sup>	1.50 <sup>a</sup>	1.63 <sup>a</sup>	1.71 <sup>a</sup>	1.79 <sup>a</sup>	1.91 <sup>a</sup>	1.82 <sup>a</sup>
Total protein g/100 ml	5.03 <sup>b</sup>	5.10 <sup>a</sup>	4.02 <sup>b</sup>	4.07 <sup>b</sup>	3.4 <sup>b</sup>	3.8 <sup>b</sup>	4.86 <sup>a</sup>	5.17 <sup>a</sup>	4.19 <sup>b</sup>	4.26 <sup>b</sup>	4.04 <sup>b</sup>	4.015 <sup>b</sup>
Albumin g/100 ml	2.50 <sup>a</sup>	2.57 <sup>a</sup>	1.99 <sup>b</sup>	2.11 <sup>b</sup>	1.89 <sup>b</sup>	1.95 <sup>b</sup>	2.40 <sup>a</sup>	2.59 <sup>a</sup>	2.12 <sup>b</sup>	2.15 <sup>b</sup>	2.00 <sup>b</sup>	2.10 <sup>b</sup>
Globulin g/100 ml	2.32 <sup>a</sup>	2.36 <sup>ab</sup>	2.12 <sup>b</sup>	2.17 <sup>b</sup>	2.01 <sup>b</sup>	2.03 <sup>b</sup>	2.26 <sup>a</sup>	2.58 <sup>a</sup>	2.07 <sup>a</sup>	2.11 <sup>a</sup>	2.03 <sup>a</sup>	2.05 <sup>a</sup>

a, b, .... = Mean on the same row are differently superscripted are significantly different (P < 0.05).

\*=unit / ml.

\*\*=unit/dl.

Table 2. Effect of antitoxin (Mycodote) as detoxification agent for aflatoxin B<sub>1</sub> on blood picture of Dokki 4 hens during treatment (0-3 weeks) and recovery (4-7 weeks) periods.

Items	Treatment period (Start to 3 weeks)						Recovery period (4-7 weeks)					
	AF level (ppm)						AF level (ppm)					
	0		2		5		0		2		5	
	Mycodote %						Mycodote %					
	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1
AST*	278.3	290.2 <sup>a</sup>	232.5 <sup>c</sup>	239.3 <sup>c</sup>	220.8 <sup>d</sup>	227.2 <sup>c</sup>	275.4 <sup>a</sup>	286.8 <sup>a</sup>	246.2 <sup>c</sup>	261.3 <sup>b</sup>	23.8 <sup>d</sup>	244.1 <sup>c</sup>
ALT*	91.6 <sup>b</sup>	89.7 <sup>a</sup>	12.2 <sup>a</sup>	117.3 <sup>a</sup>	134.4 <sup>a</sup>	128.6 <sup>a</sup>	97.5 <sup>bc</sup>	92.6 <sup>c</sup>	113.5 <sup>ab</sup>	106.2 <sup>bc</sup>	128.9 <sup>a</sup>	114.7 <sup>ab</sup>
Alkaline-Ph**	32.9 <sup>a</sup>	35.4 <sup>a</sup>	36.7 <sup>a</sup>	37.2 <sup>a</sup>	4.08 <sup>a</sup>	39.9 <sup>a</sup>	32.8 <sup>b</sup>	34.7 <sup>ab</sup>	36.4 <sup>ab</sup>	32.5 <sup>ab</sup>	42.3 <sup>a</sup>	40.7 <sup>a</sup>
Criatinine**	1.38 <sup>b</sup>	1.47 <sup>a</sup>	1.51 <sup>a</sup>	1.52 <sup>a</sup>	1.61 <sup>a</sup>	1.58 <sup>a</sup>	1.37 <sup>b</sup>	1.54 <sup>ab</sup>	1.57 <sup>a</sup>	4.19 <sup>b</sup>	4.28 <sup>b</sup>	4.04 <sup>b</sup>
Total protein g/100 ml	4.99 <sup>a</sup>	5061 <sup>a</sup>	4.11 <sup>b</sup>	4.15 <sup>b</sup>	3.80 <sup>b</sup>	3.91 <sup>b</sup>	4.87 <sup>a</sup>	5.10 <sup>a</sup>	4.12 <sup>b</sup>	4.14 <sup>b</sup>	3.97 <sup>b</sup>	4.06 <sup>b</sup>
Albumin g/100 ml	2.47 <sup>a</sup>	2.66 <sup>a</sup>	2.02 <sup>a</sup>	2.14 <sup>b</sup>	1.86 <sup>b</sup>	1.93 <sup>b</sup>	2.54	2.59 <sup>a</sup>	2.08 <sup>b</sup>	2.09 <sup>b</sup>	1.96 <sup>b</sup>	2.04 <sup>b</sup>
Globulin g/100 ml	2.52 <sup>a</sup>	2.52 <sup>a</sup>	2.09 <sup>a</sup>	2.14 <sup>a</sup>	1.97 <sup>a</sup>	1.98 <sup>a</sup>	2.42 <sup>a</sup>	2.52 <sup>a</sup>	2.04 <sup>a</sup>	2.03 <sup>a</sup>	2.01 <sup>a</sup>	2.02 <sup>a</sup>

a, b, .... = Mean on the same row are differently superscripted are significantly different (P < 0.05).

\*= unit/ml.

\*\*= unit/ dl.

Table 3. Effect of antitoxin (Mycodote) as detoxification agent for aflatoxin B<sub>1</sub> on aflatoxin B<sub>1</sub> residue (ug/g) in egg yolk and albumen of Gimmizah hens during treatment (0-3 weeks) and recovery (4-7 weeks) periods.

Treatment		Egg yolk				Albumen			
		Treatment period		Recovery period		Treatment period		Recovery period	
AF Ppm	Mycodote%	1 <sup>st</sup> wk	3 <sup>rd</sup> wk	4 <sup>th</sup> wk	7 <sup>th</sup> wk	1 <sup>st</sup> wk	3 <sup>rd</sup> wk	4 <sup>th</sup> wk	7 <sup>th</sup> wk
0	0.0	-	-	-	-	-	-	-	-
0	0.1	-	-	-	-	-	-	-	-
2	0.0	11.16 <sup>b</sup>	14.18 <sup>c</sup>	3.75 <sup>b</sup>	2.16 <sup>c</sup>	11.167 <sup>b</sup>	7.33 <sup>bc</sup>	1.620 <sup>b</sup>	0.90 <sup>b</sup>
2	0.1	8.92 <sup>c</sup>	9.78 <sup>d</sup>	2.160 <sup>b</sup>	-	8.92 <sup>b</sup>	4.17 <sup>c</sup>	1.255 <sup>b</sup>	-
5	0.0	17.15 <sup>b</sup>	28.04 <sup>a</sup>	10.883 <sup>a</sup>	6.213 <sup>c</sup>	13.153 <sup>b</sup>	16.73 <sup>a</sup>	6.236 <sup>a</sup>	2.20 <sup>a</sup>
5	0.1	14.21 <sup>a</sup>	21.20 <sup>b</sup>	5.563 <sup>b</sup>	3.75 <sup>c</sup>	11.813 <sup>c</sup>	12.09 <sup>b</sup>	2.203 <sup>b</sup>	1.62 <sup>b</sup>

a, b, .... = Mean on the same row are differently superscripted are significantly different (P < 0.05).

Table 4. Effect of antitoxin (Mycodote) as detoxification agent for aflatoxin B<sub>1</sub> on aflatoxin B<sub>1</sub> residue (ug/g) in egg yolk and albumen of Dokki 4 hens during treatment (0-3 weeks) and recovery (4-7 weeks) periods.

Treatment		Egg yolk				Albumen			
		Treatment period		Recovery period		Treatment period		Recovery period	
AF Ppm	Mycodote %	1 <sup>st</sup> wk	3 <sup>rd</sup> wk	4 <sup>th</sup> wk	7 <sup>th</sup> wk	1 <sup>st</sup> wk	3 <sup>rd</sup> wk	4 <sup>th</sup> wk	7 <sup>th</sup> wk
0	0.0	-	-	-	-	-	-	-	-
0	0.1	-	-	-	-	-	-	-	-
2	0.0	10.389 <sup>d</sup>	13.89 <sup>c</sup>	3.55 <sup>bc</sup>	0.62	9.071	7.35 <sup>bc</sup>	1.453 <sup>b</sup>	0.21 <sup>b</sup>
2	0.1	9.138 <sup>c</sup>	10.10 <sup>bc</sup>	1.817 <sup>c</sup>	-	4.417	5.19 <sup>c</sup>	0.963 <sup>b</sup>	-
5	0.0	20.003 <sup>b</sup>	26.47 <sup>a</sup>	7.390 <sup>a</sup>	3.52	15.570	15.61 <sup>a</sup>	4.613 <sup>a</sup>	1.63 <sup>a</sup>
5	0.1	15.920 <sup>c</sup>	19.64 <sup>b</sup>	6.100 <sup>ab</sup>	1.81 <sup>b</sup>	11.362	11.19 <sup>b</sup>	2.44 <sup>b</sup>	0.96 <sup>b</sup>

a, b, .... = Mean on the same row are differently superscripted are significantly different (P < 0.05).



Table 5. Aflatoxin B<sub>1</sub> residue (ug/g) in organs and glands of Gimmizah hens during treatment (0-3 weeks) and recovery (4-7 weeks) periods.

Items	Treatment period (Start to 3 weeks)						Recovery period (4-7 weeks)					
	AF level (ppm)						AF level (ppm)					
	0		2		5		0		2		5	
	Mycodote %						Mycodote %					
	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1
Liver	0.913 <sup>b</sup>	0.356 <sup>d</sup>	4.990 <sup>bc</sup>	4.237 <sup>c</sup>	6.245 <sup>a</sup>	5.192 <sup>b</sup>	0.513 <sup>d</sup>	0.446 <sup>d</sup>	0.776 <sup>bc</sup>	0.673 <sup>cd</sup>	1.073 <sup>a</sup>	0.881 <sup>b</sup>
Gizzard	0.196 <sup>c</sup>	0.103 <sup>c</sup>	2.23 <sup>b</sup>	1.87 <sup>b</sup>	3.56 <sup>a</sup>	2.59 <sup>b</sup>	0.153 <sup>bc</sup>	0.102 <sup>c</sup>	0.516 <sup>ab</sup>	0.467 <sup>ab</sup>	0.813 <sup>a</sup>	0.546 <sup>ab</sup>
Breast	0.091 <sup>b</sup>	0.037 <sup>b</sup>	1.59 <sup>a</sup>	1.89 <sup>a</sup>	2.16 <sup>a</sup>	1.84 <sup>a</sup>	-	-	0.073 <sup>b</sup>	0.030 <sup>b</sup>	0.513 <sup>a</sup>	0.114 <sup>b</sup>
Thigh	-	-	2.0 <sup>ab</sup>	1.55 <sup>b</sup>	2.51 <sup>a</sup>	2.07 <sup>ab</sup>	-	-	0.158 <sup>a</sup>	-	0.660 <sup>a</sup>	0.170 <sup>a</sup>
Heart	-	-	1.77 <sup>b</sup>	1.54 <sup>b</sup>	2.27 <sup>a</sup>	1.99 <sup>ab</sup>	-	-	-	-	0.412	0.337
Spleen	-	-	1.72 <sup>bc</sup>	1.48 <sup>c</sup>	2.19 <sup>a</sup>	1.82 <sup>b</sup>	-	-	0.16-2 <sup>bc</sup>	0.105 <sup>c</sup>	0.493 <sup>a</sup>	0.246 <sup>b</sup>

a, b, .... = Mean on the same row are differently superscripted are significantly different (P < 0.05).

Table 6. Aflatoxin B<sub>1</sub> residue (ug/g) in organs and glands of Dokki 4 hens during treatment (0-3 weeks) and recovery (4-7 weeks) periods.

Items	Treatment period (Start to 3 weeks)						Recovery period (4-7 weeks)					
	AF level (ppm)						AF level (ppm)					
	0		2		5		0		2		5	
	Mycodote %						Mycodote %					
	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1
Liver	0.872 <sup>d</sup>	0.673 <sup>d</sup>	4.68 <sup>b</sup>	4.03 <sup>c</sup>	6.43 <sup>a</sup>	5.217 <sup>b</sup>	0.532 <sup>d</sup>	0.522 <sup>d</sup>	0.833 <sup>b</sup>	0.770 <sup>dc</sup>	0.123 <sup>a</sup>	0.823 <sup>b</sup>
Gizzard	0.243 <sup>d</sup>	0.130 <sup>d</sup>	1.98 <sup>bc</sup>	1.56 <sup>c</sup>	3.82 <sup>a</sup>	2.41 <sup>b</sup>	0.283 <sup>b</sup>	0.130 <sup>c</sup>	0.416 <sup>b</sup>	0.383 <sup>b</sup>	0.813 <sup>b</sup>	0.580 <sup>b</sup>
Breast	0.106 <sup>c</sup>	0.053 <sup>c</sup>	1.62 <sup>ab</sup>	1.42 <sup>b</sup>	2.01 <sup>a</sup>	1.67 <sup>ab</sup>	-	-	0.041 <sup>b</sup>	-	0.360 <sup>a</sup>	0.113 <sup>b</sup>
Thigh	-	-	1.56 <sup>b</sup>	1.99 <sup>ab</sup>	2.67 <sup>a</sup>	2.10 <sup>ab</sup>	-	-	-	-	0.390	0.337
Heart	-	-	1.66 <sup>b</sup>	1.61 <sup>b</sup>	2.36 <sup>a</sup>	1.83 <sup>b</sup>	-	-	-	-	0.219	-
Spleen	-	-	1.56 <sup>b</sup>	1.60 <sup>b</sup>	2.23 <sup>a</sup>	1.78 <sup>b</sup>	-	-	0.112 <sup>b</sup>	0.74 <sup>b</sup>	0.416 <sup>a</sup>	0.217 <sup>b</sup>

a, b, .... = Mean on the same row are differently superscripted are significantly different (P < 0.05).

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## مدى فاعلية الميكودوت في تثبيط سموم الأفلاتوكسين الملوثة لعلائق الدجاج المحلى

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استخدم فى الدراسة عدد ١٩٢ طائراً من سلالتى الجميزة ودقى ٤ عمر ٤٨ أسبوعاً ٩٦ طائراً من كل سلالة (٩٠ دجاجة + ٦ ديوك) وتم تقسيم الطيور إلى ثلاثة مجاميع . تمت التغذية فيها على عليقة تحتوى على أفلاتوكسين بمستوى صفر ، ٢ ، ٥ جزء فى المليون ، وداخل كل مجموعة تم اضافة ميكودوت كمضاد لسموم الفطريات بمستوى صفر ، ٠.٠١ ، ٠.٠١ % وأستغرقت التجربة ٧ أسابيع مقسمة على فترتين :

الأولى : لمدة ٣ أسابيع (فترة المعاملة).

الثانية : لمدة ٤ أسابيع تمت التغذية فيها على علائق خالية من الأفلاتوكسين والميكودوت ( فترة الأستشفاء)

وأظهرت الدراسة النتائج التالية:

كيمياء السدم: - لوحظ انخفاض فى معظم محتويات الدم AST والبروتينات الكلية والألبومين والجلوبيولين وزيادة فى إنزيم ALT والفوسفاتيز القاعدى والكرياتين للمجاميع المغذاة على علائق ملوثة بالأفلاتوكسينات وكان التأثير أكثر فى المجاميع المغذاة على مستويات مرتفعة من الأفلاتوكسين (٥ جزء فى المليون) بالمقارنة بالمستوى المنخفض (٢ جزء فى المليون).

الأثر المتبقى من الأفلاتوكسين فى البيض: وجد أثر متبقى للأفلاتوكسين فى مكونات البيض لكل من الصفار والبياض وذلك فى المجاميع المغذاة على علائق ملوثة بمستويات مرتفعة من الأفلاتوكسين (٥ جزء فى المليون/كجم عليقة) بدون إضافة مضاد وكان الأثر المتبقى لهذه السموم فى الصفار أعلى منه فى البياض- استمر هذا التأثير ولكن بدرجة أقل فى نهاية فترة الأستشفاء فى المجاميع المغذاة على مستويات مرتفعة من الأفلاتوكسين بدون إضافات.

الأثر المتبقى للسموم فى الأنسجة والأعضاء: لوحظ احتجاز جزء من الأفلاتوكسينات فى الأعضاء وكان أكثرها تأثراً هو الكبد ومن بعده الطحال والقلب والصدر والعضلات ولكن بدرجة أقل، أدى

إضافة مضاد السموم (الميكودوت) إلى انخفاض السموم المحتجزة بالأنسجة والأعضاء وكان أقل انخفاض لها في فترة الاستشفاء.

نستخلص من هذه الدراسة أن استخدام الميكودوت بنسبة ٠,١% كمضاد للسموم الفطرية كان له تأثيره الفعال في تقليل الآثار السلبية لمستوى ٢ و ٥ جزء في المليون أفلاتوكسين ب١ عند تواجده في علائق الدجاج البياض من السلالات المحلية (الجميزة ودقي ٤).

كما أن فترة سحب السم الفطري من علائق الدجاج البياض والتي بلغت ٤ أسابيع (الاستشفاء) كانت كافية لعودة الطيور بدرجة كبيرة لأدائها الإنتاجي الطبيعي.