

A STUDY ON THE ANALYSIS OF OCHRATOXIN-A IN DIFFERENT POULTRY FEED INGREDIENTS

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ABSTRACT:

A study to assess Ochratoxin content in different feed ingredients was conducted. Out of 156 samples of feed ingredients analyzed 36 were found contaminated with ochratoxin. The highest content was detected in maize (*84.4 ug/kg) while millet contained the minimum content (5 ug/kg). 120 samples i.e. 77% were found to be free of ochratoxin and 23% were contaminated. In the light of these results it is suggested that proper harvesting, storage of feed be done and unhygienic method of processing and production be avoided.

INTRODUCTION

Various diseases of unknown aetiology in animals have been reported being associated with ingestion of moldy feeds. Present studies revealed that these diseases are caused by the presence of mycotoxin in feeds. Mycotoxins are toxic substances that may be produced by molds in the feed both in field and storage conditions. Ochratoxins of which ochratoxin A (OA) is the most prevalent and they are structurally related to secondary metabolites produced by *Aspergillums* ochraceous, *Penicillium viridicatum* and certain other species of the genera *Aspergillums* and *permicillium*. Van Der Merwe *et al.* (1965) first isolated OA from the fungus *Aspergillus ochraceous*.

Ochratoxins have been found as natural contaminants of many foods and feed stuffs such as corn (Shotwell *et al.*, 1969) wheat (Scott *et al.*, 1970, Prior, 1976) barley (Fishbach and Rodricks 1973) and oats (Krogh *et al.*, 1973). The contamination of poultry feeds with OA has been well documented (Hamilton *et al.*, 1982) and can result in significant productivity losses for broiler, layer and turkey operations. Ochratoxins reduces growth rate, contributes to leg problems in broilers (Huff *et al.*, 1980) and induces a condition that mimics pale bird syndrome through malabsorption of nutrients (Huff and Hamilton 1975 Orborne *et al.*, 1982). Ochratoxins also cause immunosuppression through its effects on complement activity and phagocytosis.

Ochratoxin a nephrotoxin causes enlargement and discoloration of the kidney and uric acid accumulation. (Huff *et al.*, 1974, Huff and Hamulton 1975, Krogh *et al.*, 1976). A spontaneous toxic nephropathy in poultry associated with ochratoxin A was described in Denmark with lesions including enlarged pale kidneys containing ochratoxin A residues (4.3-29.9 mg/kg) atrophic and degenerative changes of proximal and distal tubules and intestinal fibrosis.

In Pakistan various feed ingredients incorporated in poultry feeds of different commercial feed mills provide a suitable substrate for fungal growth due to improper harvesting and storage conditions, unhygienic methods of processing and production, poor methodology of consumption

and utilization and therefore likely to be contaminated with Ochratoxin-A. Keeping in view, the aforesaid situation arising from the consumption of Ochratoxin-A in poultry the present study was therefore designed to quantify the Ochratoxin-A contents in few poultry feed ingredients.

MATERIAL AND METHODS

A total of 156 ingredients were collected from different sources and analyzed in feed testing laboratory for presence of ochratoxin-A. Each sample was analyzed quantitatively for the estimation of ochratoxin-A by modified method of Choo and Liu (1988) and Abdul Hamid (1990).

RESULT AND DISCUSSION

The level of ochratoxin-A in different feed ingredients have been presented in table 1. Results revealed that out of 156 samples analyzed 36 were positive for ochratoxin-A. Maize contained maximum level of ochratoxin-A (104.4 ug/kg) while millet contained the minimum content (2.5 ug/kg). Analysis shows the other feed ingredients usually contaminated were wheat (65.5 ug/kg) and cotton seed and soyabean meal (31 ug/kg).

120 samples (77%) were found free of ochratoxin-A whereas 23% were contaminated. Due to the extreme toxicity of OA in poultry and the occurrence of this mycotoxin in feed ingredients and finished food it is important to find ways of reducing its effect on poultry production. In vitro studies have indicated that toxicity of OA may be altered through the supplementation of phenylethylamine in feed. This work is in initial stages in our laboratory.

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Table 1
Levels of Ochratoxin-A in different Poultry Feed Ingredients

S. No.	Feed Ingredients	No. of Total Samples	No. of Contaminated	Ochratoxin – A Content of Samples ug/kg	Mean Values	Standard Error
1.	Wheat	12	4	80, 98, 25, 40	60.75	17
2.	Maize	12	5	102, 140, 105, 85, 90	104.4	9.62
3.	Rice	12	3	20, 25, 15	20	2.89
4.	Sorghum	12	2	30, 38	34	4.01
5.	Barley	12	3	25, 15, 38	26	6.67
6.	Grams	12	2	10, 15	12.5	2.51
7.	Ground nut	12	2	30, 48	39	9.03
8.	Millet	12	3	3, 2	2.5	.5
9.	Cotton Seed meal	10	2	20, 42	31	11.03
10.	Soyabean meal	10	2	20, 42	31	11.03
11.	Rapeseed meal	10	2	28, 10	19	9.03
12.	Sunflower meal	10	3	68, 30, 50	49	10.99
13.	Guar meal	10	2	22, 20	21	-
14.	Corn gluten meal	10	2	20, 22	21	1.00

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