

Effects of Long Term Feeding Of Diets Containing Graded Levels of Fumonisin B1 (Fb1) to Laying Hens

El boraay, I. M;* Elham, A. EL-Shewy;** Khalid M. Fararhc*** and Heba H. El-Ghareeb.****

Dept. of Poultry Diseases*; Forensic Med. and Toxicology** and Clinical Pathology**, Fac. of Vet. Med. Benha University.

**** Dept.of Path. Institute of Animal Health Research. Dokki Egypt .

ABSTRACT

A 20- week experiment with laying hens was carried out to examine the effects of feeding graded levels of FB1 on performance, chemical parameters, antibody titers to Newcastle disease virus in serum and histopathological changes in different organs. The graded levels of FB1 are 100 mg FB1/kg diet (group2); 200 mg FB1/kg diet (group 3) and 400 mg FB1/kg diet (group 4), while group 1 fed diet uncontaminated with FB1. Each group included 16 hens. The increase of laying intensity and egg weight during the course of experiment was lower in hens of groups 2,3 and 4 than hens of group 1. While the body weight during the experimental period was lower in only hens of group 4 (fed on 400 mg FB1/kg diet) compared to those of groups 1, 2 and 3. A significant increase in alanine aminotransferase, aspartate aminotransferase, chloesterol, blood urea nitrogen and creatinine in FB1 treated groups compared to control one. While there was no significant changes in the level of the tumor marker Alphafeto protein (AFP) in FB1 treated groups compared to control one . Hens in groups 2, 3 and 4 have a significant decrease in serum titers to NDV.

Histopathological changes revealed thickening in the wall of blood vessels in different organs, fatty infiltration in heart and gizzard degeneration in proventriculus, nephrotoxic and hepatotoxic changes.

INTRODUCTION

Fumonisin B1 (FB1) is a mycotoxin produced by *fusarium verticillioides* (Formerly, *Fusarium moniliforme*) and is found in diverse crops such as corn, wheat and barley. Many diseases linked to FB1, such as porcine pulmonary edema, rat hepatic cancer and equine leukoencephalomalacia, which indicated a compromised immune system (1-3).

FB1 is hepatotoxic to all animal species tested, including mice, rats, equines, rabbits, pigs and non-human primates. With the exception Syrian hamsters, embryotoxicity or teratogenicity is only observed concurrent with or subsequent to maternal toxicity. It has hepatocarcinogenic and nephrocarcinogenic effects in rats and mice. Also, it inhibits cell growth and causes accumulation of free sphingoid bases and alteration of lipid metabolism in animals, plants and some yeasts (4-6).

The effects in humans are unclear, but epidemiologic evidence suggests that consumption of fumonisin- contaminated corn

was contributed to human esophageal cancer in Southern Africa and China (7). Moreover, there has been one report in India of a disease outbreak characterized by abdominal pain, borboryami and diarrhea., suspected to be associated with foodborne FB1 (8).

Although hens and broilers are regarded as very resistant to FB1 (9-11), it has been shown to cause feed refusal, poor growth, alter serum chemistry and organ lesions in poultry (12-14). Percentage of hen-day egg production was significantly lowered for the first 28 day laying period in ducklings fed 200 mg FB1/Kg diet (14).

Limited information exists with respect to the FB1 effect on the immune system of chicks. FB1 is cytotoxic to chick macrophages *in vitro* (15).

Significant suppression in total IgM and IgG levels in chicks fed diet contained FB1, FB2 and moniliformin (16). Also immunosuppressive effect of FB1 was evidenced by lowering HI or SN antibody titer in broiler chicks vaccinated against ND and IBD (17).