

Review Article

Aflatoxicosis in a duck farm

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Abstract

Aflatoxin is included in the amino alcohol group of mycotoxins. It is hepatotoxic and, therefore, affects all liver functions, such as the metabolism of nutrients in the diet, as well as protein synthesis and immune effectors. Therefore, affected poultry suffer a decrease in productivity and immunosuppression. The 4 aflatoxins of concern are B1, B2, G1, and G2. However, B1 is the most predominant and toxic to humans and animals. Aflatoxin contamination is typically found in grains and tree nuts, peanuts and peanut products, corn and corn products, cottonseed oil, and milk. Crops can become contaminated with aflatoxins while growing in the field, during harvesting, transportation, mixing, or during storage

Introduction

Aflatoxins are one of the key challenges faced by poultry farmers as well as by Poultry Feed manufacturer in India as it leads to serious economic losses. In our country having tropical climate with hot and humid condition coupled with poor harvesting of crops during monsoon season, inadequate drying and storage facilities make feed stuff susceptible to fungal contamination resulting in greater economic losses to poultry industry through Mycotoxicosis. In addition to these there are improper management practices which are being followed at more than 60 percent poultry farms in India which further increases the risk of mycotoxins to very high level. Mycotoxicosis is the condition associated with fungal contamination of feeds or feed ingredients. Among mycotoxins, aflatoxins are predominant and are one of the major fungal toxins which are responsible for potential problem in Poultry feeds. Aflatoxins are produced from fungi of the genus *Aspergillus* and major forms of aflatoxins include B1, B2, G1 and G2 with B1 being the most dangerous and common active toxin. It's just not about Poultry but aflatoxins affect both human as well as animals.

Clinical signs

- The most economically significant effects in growing birds are decreased growth rate and poor feed conversion because metabolites of aflatoxins bind to DNA and RNA of the cells and hence reduce protein synthesis.
- Immunosuppressive effect due to decrease cell mediated immunity and to lesser extent humoral immunity leading to vaccination failure and decrease resistance to infectious disease.
- Passage of undigested food in the dropping.
- Anemia of the infected birds due to decrease food intake and hence occur failure of normal pigmentation and decrease pcv.
- Decrease egg production in layers quantitatively and qualitatively also in breeders decrease hatchability due to embryonic mortality and may fertility due to decrease testicular weight and hence decrease semen volume (sperm counts).

Liver as a Key Player of AF Toxicity and Sensitivity with in Poultry Species

Absorption of aflatoxin in the upper part of the small intestine (80-90 percent eaten is absorbed), AF undergoes an extensive transformation into metabolites in the liver. AF are not toxic per se, but require metabolic conversion by hepatic enzymes (the cytochrome P450 family) to the metabolically active metabolite exo-AFB1-8, 9-epoxyde to exert its toxicity.

Immune and Metabolic Disorders

Upon Aflatoxin Exposure aflatoxin acts as an inhibitor of protein synthesis and, subsequently, dividing cells and tissues with a high protein turnover such as that found in the liver, immune system or gut epithelium, which is most susceptible to the toxic effects of aflatoxins.

Conclusions

Generally, 0.95 mg/kg aflatoxins in the diet reduce weight gain by 11 percent because of, in part, reduced feed intake and metabolic inefficiencies from liver and GIT damage. The metabolic pathways of AFB1 in the liver are very complicated, and not all species go through the same reactions. However, duck producers, in particular, need to pay particular attention because of the duck's low resistance to AF.

References

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