

# Guar Gum: A Novel approach for detoxification of aflatoxicosis in Poultry



## Zinayyera Subhani and Muhammad Shahid

Department of Biochemistry,  
University of Agriculture, Faisalabad

As the climatic conditions of Pakistan are warm, moist and damp, that provides best condition for the development of fungus in the poultry feed. Poultry industry is an imperative part of livestock having 52.2% share in agro based economy of Pakistan.

Aflatoxins are the secondary metabolites produced by filamentous fungi *Aspergillus flavus* and *Aspergillus paraciticus*. There are four major types of aflatoxins; aflatoxin B<sub>1</sub>, B<sub>2</sub>, G<sub>1</sub> and G<sub>2</sub>. These four major aflatoxins are classified because of their blue and green fluorescence

under the ultraviolet light. Among them, AFB<sub>1</sub> found to be more notorious, is the most toxic and most potent carcinogen in human and animals including birds, fish, rodents, nonhuman primates. It has highest toxic potential due to mutagenicity, teratogenicity and carcinogenicity. The contamination of aflatoxin in the feed may cause aflatoxicosis in poultry birds that leads to low growth rate, weight loss, poor FCR and anorexia. The increased susceptibility to microbial and environmental stresses caused by aflatoxins ultimately increases the rate of mortality.

Government and producers are trying to find out or develop effective prevention management and decontamination technologies to minimize the toxic effects of AF by using biological, physical and chemical treatments to detoxify AF in contaminated feed stuff. A practical approach for detoxification aflatoxins in poultry feed is the use of adsorbents. As adsorbents have the potential to bind aflatoxin and inhibit their absorption from gastrointestinal tract. Although, large extents and negative interaction of adsorbents with nutrients are the reasons of great concern. Therefore, need was felt to find out an adsorbent that should be cost effective, low interaction with nutrients and no side effect on health of bird.

Guar gum was used as an adsorbent to control aflatoxicosis and tested by conducting the 42 days experiment on Hubbard bird with different levels of guar gum along with aflatoxin contaminated feed. The results from the *in vivo* experiment indicate that the aflatoxin significantly reduced body weight and affected overall broiler health and performance. Guar gum was effective in diminishing the growth inhibitory effects of aflatoxin and there was apparent protection noted for some physical parameters, some of the organs, serum biochemical and hematological changes associated with aflatoxin toxicity.



Fed on aflatoxin contaminated feed



Aflatoxin along with 1% guar gum

Guar gum found to be effective, have the ability to sequester aflatoxin, a low effective inclusion rate in the feed, high stability over a wide pH range and no affinity for any nutrient. So, in such a way we are able to find out the aflatoxin binder from cheaper resources that is enough to prevent the aflatoxin associated risk factors. This is the novel approach to detoxify the aflatoxin from natural resources, with improving food & feed quality of local population ultimately able to get better opportunities for exporting poultry meat and eggs.

