Project Title: Aflatoxicosis in Cobb® 500 broiler chicken: prevalence of aflatoxin in feeds, its impact on health and productivity, and control using binders

Institute: Biotechnology Research Institute
Center(s): KALRO BioRI-Muguga
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Problem Statement: In developing countries, consumption of unsafe food is a major cause of preventable disease and mortality in both human and animals. Food products are susceptible to safety risks as they move along the value chain exposing consumers to health hazards due to rapidly changing production practices, lack of human and institutional capacity, and poor oversight by governments and limited public health awareness. A large proportion of animal feeds in Kenyan market are of poor quality due to use of contaminated materials or poor storage conditions. Mycotoxin contamination can enter the feed chain during any stage of the value chain. Commercial chicken feeds are cereal-based thus prone to attack by toxigenic fungi. This exposes chicken to dietary mycotoxicosis which compromises their health status, performance and also exposes consumers to violative mycotoxin residues in edible chicken products. Ultimately, this reduces chicken production, increases chicken and human morbidity, reduces chicken products marketability and impedes poultry sub-sector’s potential contribution in national economic growth agenda.

Objective(s): General objective:
To study the natural occurrence of aflatoxin B1 in chicken feeds, establish its impact in production of Cobb 500® broiler chicken and evaluate effectiveness of its control employing a dietary intervention strategy.
Specific objectives
1. To study the prevalence, levels and exposure to dietary aflatoxin B1 in broiler value chain in Kenya
2. To evaluate the impact of dietary aflatoxin B1 toxicosis on growth, feed intake, and feed conversion efficiency in Cobb 500® broiler chicken
3. To determine the effect of dietary aflatoxin B1 toxicosis on haematology, serum biochemistry, immune responses and tissue pathology in Cobb 500® broiler chicken
4. To establish the effectiveness of organic (Mycosorb A+, Mycofix Select®, and clay-based (Novasil plus®) absorbent products in ameliorating the deleterious effects of dietary aflatoxicosis in Cobb 500® broiler chicken

Planned Activities
1. Collection of field chicken feed samples
2. Analysis of field feed samples for aflatoxins
3. Compilation of mycotoxin data (retrospective study)
4. Purchase of animals & maintenance
5. Sampling of experimental broiler feed samples for mycotoxin screening
6. Monitoring of production parameters of experimental chicken
7. Clinical examination, Gross & Histopathology of experimental chicken
8. Haematological analysis of experimental chicken
9. Serum biochemistry analysis of experimental chicken
10. Monitoring of vaccine titers
11. Collection of liver samples for aflatoxin residues
12. Decontamination of Labware & workplace and disposal of mycotoxic waste
13. Data management

Outputs
1. The prevalence, levels and exposure to dietary aflatoxin B1 in broiler value chain in Kenya studied
2. The impact of dietary aflatoxin B1 toxicosis on growth, feed intake, and feed conversion efficiency in Cobb 500® broiler chicken evaluated
3. Effect of dietary aflatoxin B1 toxicosis on haematology, serum biochemistry, immune responses and tissue pathology in Cobb 500® broiler chicken determined
4. Effectiveness of organic and clay-based absorbent products in ameliorating the deleterious effects of dietary aflatoxicosis in Cobb 500® broiler chicken established

Outcomes: The data generated in this study will provide information addressing animal health issues to allow appropriate intervention strategies for promotion of poultry production and marketing

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