Université de Lomé (Togo)
Centre d'Excellence Régional sur les Sciences Aviaires
http://www.cersa-togo.org
cersa.univ.lome@gmail.com

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by varied levels of MOSM and were within the normal range (9.06-31-0x106/g) recommended for broiler birds except for WBC, lymphocyte, neutrophiles, and platelets which were higher than the average values. The results of the biochemical parameters indicated that urea was significantly ($P<0.05$) influenced by increasing levels of MOSM compared to the control. However, elevated values of serum cholesterol, Sodium, Chlorine, glucose and Calcium were observed although not significant. All other serum indices were not significantly ($P>0.05$) influenced by increasing levels of MOSM.
Conclusion: The study suggests that the dietary inclusion of MOSM significantly reduced weight gain but did not reduce the serum cholesterol levels in the broiler birds. Benchmark study of 20 commercial mycotoxin binders.

BENCHMARK STUDY OF 20 COMMERCIAL MYCOTOXIN BINDERS

Tom RIJSSELAERE1*, Brecht BRUNEEL1, Arno VAN DER AA, Christ'l DETAVERNIER2, Marthe DE BOEVRE2, Sarah DE SAEGER2, Ludo SEGERS1
1Orffa Additives BV, The Netherlands; 2Laboratory of Food Analysis, Ghent University, Belgium; * Corresponding author: rijsselaere@orffa.com

Introduction: The Food and Agricultural Organisation estimated that 25% of the world's feedstuffs are affected by mycotoxins each year. Recent scientific updates indicate an even higher percentage of contaminated feeds and emphasised the co-occurrence of several types of mycotoxins (2016). Due to their toxicity, mycotoxins mainly affect the immune system, intestinal function and fertility. Relieving animals of this threat is a hugh challenge. Clay-based binders and yeast-based organic components play an important role in the prevention of mycotoxicosis. Since 2010, Orffa is elaborating on a complete mycotoxin management preparation, tailored to the co-occurrence of multiple mycotoxins in feedstuffs. Multiple in vitro trials were performed to evaluate the binding capacity of single ingredients which formed the basis for the development of a commercial preparation, Excential Toxin Plus, consisting of 5 synergistically working ingredients.
Objective: The aim of this study was to compare the in vitro binding properties of the mycotoxin binder (Excential Toxin Plus) with 19 different, clay based mycotoxin binders sourced worldwide.
Methods: Excential Toxin Plus was benchmarked against 19 commercially available mycotoxin binders (including 6 premium global brands) for binding capacity and biotransformation of the 12 most pronounced mycotoxins. The in vitro experiments were designed in close collaboration with MYTOX and executed by the Laboratory of Food Analysis (Ghent University, Belgium). The mycotoxins aflatoxin B1/B2/G1/G2, ochratoxin A, zearalenone (ZEN), deoxynivalenol (DON), fumonisin B1/B2, HT-2 toxin, T-2 toxin and enniatin B were mixed into a buffer solution together with the different binders (0.5%) at pH 3 (one solution per binder). Under gentle, constant shaking (to mimic peristalsis of the gastro-intestinal tract), these solutions were kept at pH 3 for one hour, and analysed by LC-MS/MS. The remaining solution was brought to pH 7, to mimic the condition in the intestine, and kept stable for three hours. Afterwards a sample was analysed by LC-MS/MS.
Results: The majority of preparations showed a complete binding of the tested aflatoxins and enniatin B. For fumonisins, 12 preparations showed a clear negative pH effect. These preparations released the bound fumonisins to a certain extent at pH 7. Thirteen out of 20 preparations scored for at least 1 fumonisin type and pH level no binding at all. Only three products reached complete binding of ZEN at pH3. At higher pH level, 14 samples showed no or limited binding. For ochratoxin, three preparations showed no significant binding (<10%) for both pH 3 and 7, and 14 preparations showed no significant binding at pH 7. Trichothecenes (DON, T-2 and HT-2) were in general difficult to bind. DON, in particular, showed to be difficult to bind by any preparation and was detected in the supernatant by LC-MS/MS. This suggests that biotransformation by any preparation into less toxic metabolites is minimal.
Conclusion: From this benchmark study it could be concluded that the used method differentiates in vitro mycotoxin binding efficiencies between commercially available products. This study clearly demonstrated the results on differentiation between products and resulted in a selection of a group

including Excential Toxin Plus of more effective mycotoxin binders

THE INFLUENCE OF BROILER FEED FORM ON THE METABOLIC AND SKELETAL DISORDERS

Nchele KULEILE, Khotso NCHECHE, Thato MACHELI, and Mocowene NTSOANA.
Department of Animal Science, National University of Lesotho

A completely randomized study was conducted at the National University of Lesotho farm (altitude 1716 metres) to address the high incidence of metabolic and skeletal disorders in broiler chickens. The broiler growth rate has been found to have a direct relationship with susceptibility to ascites, sudden death syndrome (SDS) and lameness. Manipulation of the diet composition and feed form has a major effect on the incidence of metabolic disorders. In most instances, such changes to the feeding programme and feed form influence disorders via their effect on growth rate. Most meat birds are fed crumbled or pelleted diets to achieve maximum growth and feed efficiency. Feeding mash on the other hand reduces growth rate (1 to 2 days to market), mortality and condemnations due to metabolic disease. The incidence of ascites also increases significantly at altitudes greater than 1300 meters above sea level, presumably because of the low oxygen partial pressure.
The ascites incidences are very high in Lesotho during the cold winter months, accounting for more than fifty percent of the total mortality. The main objective of the current study was to assess the effect of different feed forms on the occurrence and control of metabolic disorders in broilers. A total of (n=200) day-old Ross 308 chicks were randomly distributed into two dietary treatments made up of two broiler feed forms namely mash and pelleted diet replicated four times with twenty-five birds per replicate. The two dietary treatments had similar nutritive value across all feeding phases with exception of feed form. Chicks were housed in a well ventilated house where treatment diets and water were offered on adlibitum basis. Data collection was done on daily basis for mortality, signs of ascites, lameness and SDS. All dead birds were examined for the signs of ascites by presence or accumulation of fluids in the abdominal cavity. The findings of the current study indicated that dietary treatment had a significant ($P<0.05$) influence on incidences of ascites, lameness and mortality in broiler chickens whereby birds offered diet in the form of pellets had higher incidences of the ascites, lameness and mortality than birds fed diet in mash form. On the other hand the dietary treatments did not have a significant ($P>0.05$) effect on SDS. However, there were more incidences of SDS in birds offered pelleted diets than mash diet. Birds fed mash diet had fewer incidences because they were experiencing moderate growth rates compared to birds fed pelleted diet with fast growth rates. Birds offered mash spend more time consuming their feed compare to birds fed pellets and therefore, expend more energy in this process. It was evident from the results that diet in mash form can be used to control the incidences of metabolic disorder by reducing growth rates of broilers.
Key Words: Feed form, Ascites, Mash, Pellets, Growth rates

INFLUENCE OF DIETARY FAT INCLUSION IN LAYER'S DIET ON PRODUCTION AND EGG QUALITY PARAMETERS

Nchele KULEILE, 'Mope MOKHORO and Mahase THOOKO
Department of Animal Science, National University of Lesotho

The high feed cost for laying hens in Lesotho had forced the majority of farmers to adopt other feeding techniques that could lower the feed costs. The commonly used technique being diet dilution using non starch polysaccharides (NSP) sources such as brewery grain, maize and wheat bran. The NSP sources are renowned for their poor utilization and digestibility by laying hens and these lead to poor laying performance and poor egg quality. However, farmers are not taking advantage of utilizing dietary fat sources such as tallow and lard from rendering facilities and animal slaughtering facilities.