Aflatoxins in Commonly Used Feed Raw Materials: A Quantitative Analysis

Muoneke O.E. and Ekanayake W.E.M.L.J.*
Department of Animal Science,
Faculty of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka

Aflatoxins produced mainly by *Aspergillus flavus* and *Aspergillus parasiticus* are known to be carcinogenic and mutagenic. Aflatoxins concentration (AC) in feed raw materials such as maize, wheat and rice by-products can exceed the threshold levels resulting in reduced quality of feed produced. This study aimed to quantify the AC and its association with other nutrients such as moisture, crude protein, ether extract, crude fibre and ash in commonly used feed raw materials. Two-year (2021-2022) data of AC and proximate composition (PC) of commonly used feed raw materials were extracted from a database of one of the largest concentrate feed manufacturers in Sri Lanka. The data were then analyzed using R software version 4.01, and the associations between PC and AC were quantified using correlation analysis and principal component analysis (PCA). The number of PCA components was determined using both Eigen values and Monte Carlo PCA simulation. The highest crude protein was found in Meat & Bone Meal (50.3±1.8%) and the lowest in Palm Kernel Meal (17.8±1.5%) of the protein sources used in feed formulation. The Dried Distillers Grains had the highest moisture content (14.9±1.8%) and Meat & Bone Meal had the lowest moisture content (3.4±2.0 %). Overall, the AC of most of the raw materials used in feed processing exceeded the threshold of 20 µg/kg with the lowest level being observed in Boll Rice (4.9±1.2 µg/kg) and the highest (55.5±58.3 µg/kg) in Dried Distillers Grains. The correlation coefficients ranged from -0.68 to 0.57 and aflatoxin concentrations were poorly associated with feed nutrients except for moisture content (r=0.35). Therefore, these findings suggest that the aflatoxins concentration in feed raw materials increases when moisture content increases. This suggests that proper drying of raw materials should be encouraged prior to feed storage and processing to reduce the aflatoxins concentration in feed raw materials.

Keywords: Aflatoxins, Concentrate feeds, Feed raw materials, Nutritional quality

* jayekn@agri.pdn.ac.lk