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The Prevalence of Mycotoxin Contamination of Animal Feeds and Implications on Milk Safety in Kenya

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Abstract

Mycotoxins are metabolites of fungal contamination of animal feeds as a result of poor feed storage or on-field infestation during plant growth. These mycotoxins are subsequently excreted in milk when dairy animals consume such feeds and therefore posing a safety risk of public health concern. The aim of this study was to conduct a risk assessment in milk from small-scale farms that form the informal dairy sub-value chains in rural system in Olenguruone and peri-urban system in Bahati, both in Nakuru County, by determining the prevalence and quantifying levels of mycotoxins in animal feed and milk. A total of 74 animal feed samples from actors in informal dairy value chain and 120 milk samples from individual cows were simultaneously collected. Feed samples were analysed for Aflatoxin B1 (AFB1) and Deoxynivalenol (DON) while milk samples were analysed for Aflatoxin M1 (AFM1). Mycotoxin concentration level was determined using commercial enzyme linked immune sorbent assay (ELISA). Results showed that 56 % of all animal feeds had AFB1 above European Union (EU) limits of 5 μg kg^{-1} while 63 % had DON. Levels of AFB1and DON in animals feed was significantly ($p < 0.05$) high and was determined by the type of feed which was either concentrate or forage and the source of the feed which was either commercial or farm-sourced. The farm-sourced concentrates being used in the peri-urban dairy system reported the highest AFB1 and DON contamination. Forages used in rural dairy system had the lowest AFB1 and DON below the EU limits. Only milk samples from the peri-urban dairy system had AFM1 contamination levels that exceeded the EU limits of 0.05 μg L^{-1}. Therefore there was a higher public health risk of AFM1 in peri-urban system. The results obtained from this study indicate that the peri-urban dairy system which is intensive faces the challenge of quality feed and one contributing factor is the on-farm production and handling of animal feeds.

Keywords: Aflatoxin B1, animal feeds, deoxynivalenol and aflatoxin M1, milk

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