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“Solidarity in a competing world —
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Association of On-Farm Animal Feeds Handling Practices with Growth of Mycotoxin Producing Molds in Feeds on Smallholder Dairy Farms in Nakuru, Kenya

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Abstract

Practices used by smallholder dairy farmers for handling of animal feeds at the farm pose a risk of mycotoxins to dairy animals and dairy products, hence a public health concern. The aim of the study was to document the on-farm practices of handling animal feeds used by these farmers and how they influence the growth of mycotoxin producing fungi together with prevailing extrinsic conditions. The study involved the use of structured questionnaires to interview smallholder dairy farmers ($n=120$) on on-farm feed handling practices and collection of feed samples ($n=97$) for microbial analysis of the mycotoxin producing molds. The mold counts were interrelated with the feed handling practice and therefore a measure of its impact. Results found out that rural dairy system was characterised by practice of free range grazing unlike peri-urban system practice that had semi-intensive stall feeding. As a result rural system farmers predominantly fed their cows on pasture and crop residues while in peri-urban fed predominantly on commercial dairy meals and crop residues. Though most farmers in both systems had storage facilities for animal feeds, they were in poor condition. Storage facilities in 18 % of farmers' homes were poorly constructed for use of storage of animal feeds with 12 % of farmers keeping animal feeds on the floor under humid conditions. Results showed that *Aspergillus* spp. (77 %) and *Fusarium* spp. (70 %) were the main toxicogenic fungi. The highest mold counts were observed in commercial dairy feeds of $4.39 \pm 1.0 \text{ cfu g}^{-1}$ as compared to forages and hence are of high risk for mycotoxin contamination. Feed contamination on-farm at rural and peri-urban sub-value chains with mycotoxic fungi is primarily due to poor storage facilities exposing feed to environmental conditions that favour growth of mold.

Keywords: Animal feeds, *Aspergillus*, *Fusarium*, smallholder farms