Title The effect of storage time and agroecological zone on mould incidence and aflatoxin contamination of maize from traders in Uganda

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Abstract

A study to determine mould incidence and aflatoxin contamination of maize kernels was carried out among dealers (traders) in the three agroecological zones of Uganda. The maize kernels were categorized into those stored for two to six months or for more than six months to one year. Results indicate that the mean moisture content of the kernels was within the recommended safe storage levels of ≤ 15% but was significantly lower in the Highland maize kernels followed by the Mid-Altitude (dry) kernels while the Mid-Altitude (moist) kernels had the highest levels. Across the agroecological zones, *Aspergillus*, *Fusarium*, *Penicillium* and *Rhizopus* were the most predominant fungal genera identified and, among their species, *A. niger* had the highest incidence, followed by *A. flavus*, *F. verticillioides*, *A. wentii*, *A. penicillioides* and *Rhizopus stolonifer*. There were more aflatoxin positive samples from the Mid-Altitude (moist) zone (88%) followed by those samples from the Mid-Altitude (dry) zone (78%) while samples from the Highland zone (69%) were least contaminated. Aflatoxin levels increased with storage time such that maize samples from the Mid-Altitude (dry and moist) stored for more than six months had mean levels greater than the 20 ppb FDA/WHO regulatory limits. Aflatoxin B_1 was the most predominant type and was found to contaminate maize kernels from all the three agroecological zones. These results indicate that maize consumers in Uganda are exposed to the danger of aflatoxin poisoning. Thus, there is the need for policy makers to establish and enforce maize quality standards and regulations related to moulds and aflatoxins across the agroecological zones to minimize health hazards related to consumption of contaminated kernels.