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Notes

Prevalence of aflatoxin contamination in groundnut value chains and strategies to enhance food safety in Mali

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Aflatoxin contamination is the most important food safety concern in several important crops and poses a threat to the health of consumers and the economic well-being of poor farmers in Mali. To better understand the prevalence of aflatoxins in groundnut value chains in different agro-ecological zones, investigations were carried out during 2009-10. Groundnuts taken at harvest from 90 farmers fields in 90 villages, in three agro-ecological zones, were tested for aflatoxin contamination. We observed the highest contamination, 172 μg/kg, in Kolokani (the most drought prone of the areas sampled) followed by 76 μg/kg and 35 μg/kg in Kita and Kayes, respectively. When the harvested produce in the farmers' granaries was, then, monitored monthly, analysis of samples revealed that aflatoxin content increased gradually from December to April, in all three locations. During 5 months of storage in farmers' granaries, the recorded increase in toxin content ranged from 261 to 521% over all three regions. Using the databases generated, maps were produced for Kolokani, Kita and Kayes Regions showing high aflatoxin prone areas at harvest and in storage, in all 90 villages. Analysis of nearly 4500 groundnut samples collected at regular intervals from traders, processors, wholesalers, and retail markets revealed no exception to the prevalence of unacceptably high levels of aflatoxins. Another phenomena was observed in groundnut "paste" which showed extremely high levels (>300 μg/kg) of aflatoxin in the majority of samples. Groundnut paste is prepared from poor quality groundnuts (after sorting kernels for the market), leading to high aflatoxin concentrations. We devised strategies and demonstrated to farmers integrated management technologies which address pre-harvest issues that will mitigate the toxin build up. The demonstration trials on integrated management of aflatoxins over the three locations showed 50-95% reduction in toxin contamination in farmer fields. Post-harvest management strategies were evaluated in the farmers' storage units, using double bagging of pod/seed and improved granaries, and led to aflatoxin reduction ranging from 68 to 99% reduction in aflatoxin content over the traditional methods. Overall, 4923 samples were analyzed in which aflatoxin contents ranged from 0 to 2231 μg/kg, with a mean of 146 μg/kg, for the country.

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