

Title Dietary exposure to aflatoxin from maize and groundnut in young children from Benin and Togo, West Africa

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### Abstract

Aflatoxins are a family of fungal toxins that are carcinogenic to man and cause immunosuppression, cancer and growth reduction in animals. We conducted a cross-sectional study among 480 children (age 9 months to 5 years) across 4 agro-ecological zones (SS, NGS, SGS and CS) in Benin and Togo to identify the effect of aflatoxin exposure on child growth and assess the pattern of exposure. Prior reports on this study [Gong, Y.Y., Cardwell, K., Hounsa, A., Egal, S., Turner, Hall, A.J., Wild, C.P., 2002. Dietary aflatoxin exposure and impaired growth in young children from Benin and Togo: cross sectional study. *British Medical Journal* 325, 20–21, Gong, Y.Y., Egal, S., Hounsa, A., Turner, P.C., Hall, A.J., Cardwell, K., Wild, C.P., 2003. Determinants of aflatoxin exposure in young children from Benin and Togo, West Africa: the critical role of weaning and weaning foods. *International Journal of Epidemiology*, 32, 556–562] showed that aflatoxin exposure among these children is widespread (99%) and that growth faltering is associated with high blood aflatoxin-albumin adducts (AF-alb adducts), a measure of recent past exposure. The present report demonstrates that consumption of maize is an important source of aflatoxin exposure for the survey population. Higher AF-alb adducts were correlated with higher *A. flavus* (CFU) infestation of maize ( $p = 0.006$ ), higher aflatoxin contamination (ppb) of maize ( $p < 0.0001$ ) and higher consumption frequencies of maize ( $p = 0.053$ ). The likelihood of aflatoxin exposure from maize was particularly high in agro-ecological zones where the frequency of maize consumption (SGS and CS), the presence of aflatoxin in maize (SGS) or the presence of *A. flavus* on maize (NGS and SGS) was relatively high. Socio-economic background did not affect the presence of *A. flavus* and aflatoxin in maize, but better maternal education was associated with lower frequencies of maize consumption among children from the northernmost agro-ecological zone (SS) ( $p = 0.001$ ). The impact of groundnut consumption on aflatoxin exposure was limited in this population. High AF-alb adduct levels were correlated with high prevalence of *A. flavus* and aflatoxin in groundnut, but significance was weak after adjustment for weaning status, agro-ecological zone and maternal socio-economic status (resp.  $p = 0.091$  and  $p = 0.083$ ). Ingestion of *A. flavus* and aflatoxin was high in certain agro-ecological zones (SS and SGS) and among the higher socio-economic strata due to higher frequencies of groundnut consumption. Contamination of groundnuts was similar across socio-economic and agro-ecological boundaries.

In conclusion, dietary exposure to aflatoxin from groundnut was less than from maize in young children from Benin and Togo. Intervention strategies that aim to reduce dietary exposure in this population need to focus on maize consumption in particular, but they should not ignore consumption of groundnuts.