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Main complementary food ingredients contributing to aflatoxin exposure to infants and young children in Kongwa, Tanzania

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Abstract

Complementary foods (CFs) provided to infants and young children (IYC) in sub-Saharan Africa contain ingredients that are susceptible to aflatoxin contamination. Chronic dietary exposure to aflatoxins is associated with health consequences. This study assessed the risk of exposure of IYC (6-12-month-old) in Kongwa, Tanzania to aflatoxins through CFs. The intake of aflatoxin susceptible flours (ingredients) in CFs by 35 IYC was estimated through multiple-pass 24-hr dietary recalls. Samples of the ingredients were tested for aflatoxins using High-Performance Liquid Chromatography. Exposure of a child to aflatoxins was estimated by a deterministic approach. The contribution of an ingredient to the overall exposure was estimated statistically. The key ingredients of CFs consumed by the IYC were maize, sorghum, pearl millet, rice, and groundnuts (pre-or post-blended with the other ingredients). Cereal and groundnut-based CFs were given as thin or stiff porridge. The average per capita daily intake of CFs was 89.45 g. About 82.14% of the CF ingredients were contaminated with aflatoxin B1 (AFB1) in the range of 0.27–317 μg/kg, with a median of 3.96 μg/kg. AFB1 exposures ranged from 0.33 to 1168 ng/kg bw/day (median of 23.06 ng/kg bw/day). The Margins of Exposure were less than 10,000 for all the IYC, signifying a public health concern. Post-blended groundnut flour, followed by maize, contributed the most to the exposure of IYC to AFB1. Groundnut and maize used as CFs in Kongwa are likely to be the main contributors to the exposure of IYC to AFB1. Caregivers should be advised to replace maize and groundnuts with well-processed less susceptible cereals like pearl millet and other legumes, respectively.

Keywords

Aflatoxins; Complementary feeding; Infants; Young children; Dietary exposure