STUDY OF AFLATOXINS CONTENT OF FOOD AND IMPLICATIONS IN MALNUTRITION AND CANCER IN CAMEROON

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Abstract: Aflatoxins are secondary metabolites of the mould Aspergillus flavus. Their presence in food and feedstuff contributes to the alteration of these commodities. Aflatoxin B1, the most potent one, is experimentally associated with hepatitis, immunodepression, impairment of fertility and cancer. The present work was done to evaluate the presence of aflatoxins in human food chain as a threat which combines with other factors such as malnutrition, and hepatitis B virus to deteriorate human health in Cameroon. Samples of chicken feed from poultry-farms, food stations and factories, eggs from poultry-farms, cow raw milk, breast milk, urine samples from malnourished children, and blood samples from patients with primary liver cancer were collected for 4 years according to seasonal fluctuation for aflatoxins determination by HPLC an ELISA methods. Hepatitis B virus antigen (HbsAg) was also analysed in blood samples. Fifty-three percent of samples of chicken feed tested contained detectable levels of AFB (1 - 58.2 ppb). The feeds were highly contaminated during rainy season, 37.5% positive samples in rainy season and 20% at the beginning of the dry season had more than the 20 ppb AFB guideline level recommended by different regulatory agencies. The frequency of contamination varied significantly with the climatic areas (P < 0.01, χ²). High levels of aflatoxins were found in the forest area regardless to season. Detectable levels of aflatoxins were found in 45.2% of the eggs samples tested during the rainy season. The toxins found were: AFB2a (60.7%; 0.0217 - 0.875 ppb), AFM1 (35.7%; 0.0023 - 7.604 ppb) and AFB1 (14.3%; 0.099 - 1.92 ppb). Cow raw milk was contaminated with AFM1 in 15.9% of samples, with concentrations varying from 0.006 to 0.525 µg/l. Milk from cows fed with large amounts of fermented maize (in large farms) was highly contaminated. AFM1 levels were as much as 10 to 17 fold higher than those (0.03 and 0.05 µg/l) recommended by regulatory agencies. Of the sixty-two samples of breast milk collected from different hospitals in Yaoundé (Capital city), three were positive for AFM1 with concentrations ranging from 0.005 to 0.625 µg/l. Urine samples from malnourished children suffering from kwashiorkor and marasmic kwashiorkor and children of the control group investigated for their AFB1 content, revealed a contamination rate of 45.5% in the marasmic kwashiorkor group (0.109 - 0.864 µg/l), 35.5% in the kwashiorkor group (0.109 - 2.840 µg/l) and, 11.1% in the control group (0.07 - 0.155 µg/l). Serum samples collected from patients with primary liver cancer was found to be contaminated with AFB1 (63.9%; 0.450 - 1.56 µg/l). HbsAg was detected in 69.4% of samples. Both AFB1 and HbsAg were found in 36.1% of samples. Statistical analysis showed no correlation or association between AFB1 and HbsAg. In conclusion, aflatoxin levels are present in amounts higher than the recommended standards for human health protection. Both AFB and hepatitis B virus seem to be risk factors that could increase the incidence and prevalence rates of malnutrition and cancer in Cameroon.

Keywords: Aflatoxins, feed stuff, eggs, milk, malnutrition, HbsAg, Cancer, Cameroon.

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