

EXPLORATION OF AFLATOXIN CONCENTRATIONS IN BREAST MILK USING FUNCTIONAL DATA ANALYSIS

K. Harris^{†1}, N. Polychronaki², R.M. West¹

¹*University of Leeds, UK;*

²*University of Kuopio, Finland*

[†] E-mail: *jhs3kh@leeds.ac.uk*

Egypt is an African country where the annual prevalence of hepatocellular carcinoma has increased significantly recently and is now the most common cause of cancer death. Aflatoxin has been strongly associated with this cancer and has also been shown to modify the risk associated with persistent hepatitis B infection by increasing it about tenfold. Occurrence of aflatoxins has been detected in a number of foods like corn, wheat, peanuts, corn oil, different spices and dairy products that are an essential part of the Egyptian diet. Breast milk samples from Egyptian mothers were collected monthly and HPLC used to determine the concentrations of aflatoxin M1 contamination. Functional data analysis was applied to the longitudinal data. There were some difficulties as many samples had levels of aflatoxin M1 below the detectable limit of the procedure. It was still possible however to fit smoother B-splines to the data for each mother. The overall trend was very clear, showing an enormous seasonal variation. This was consistent with variations in humidity and temperature which influence the growth aflatoxin-producing moulds in stored foodstuffs. Complete dietary data was received from all study subjects that enabled the comparison of aflatoxin concentration functions.