

BENCH-MARKING NANDI AND MAKUENI COUNTIES FOR SAFE FOOD SAFE DAIRY PROJECT

The occurrence of mycotoxins in food, especially cereals and oil seeds for both livestock and man, is a result of such food material being stored under temperature and relative humidity conditions suitable for the germination and growth of fungi. *Aspaghilas flavus* particularly grows and proliferates the toxins under these conditions.

A cereal grain with moisture content above 12.5% kept at a temperature above 22.5°C provides ideal condition for *Aspaghillus flavus* to germinate, grow and proliferate aflatoxin. Conditions conducive for production of aflatoxin by *Aspaghillus flavus* will also be suitable for the growth of fusarian moulds and of production of fumonisins.

Once proliferated, mycotoxins are very difficult to eliminate from foods and food raw materials. The temperature and time conditions required for food processing or preparation are very low compared to those required to eliminate mycotoxins especially aflatoxin. Mycotoxin destruction conditions are not tenable within normal food preparation conditions. It requires a time and temperature combination of 264°C for 30 minutes to destroy aflatoxin.

Occurrence of outbreaks of aflatoxin and fumonisin poisoning have been reported in many parts of Kenya. Fumonisin usually cause chronic while aflatoxins cause acute diseases. Fumonisin poisoning normally causes cancer of the oesophagus while aflatoxin causes damage to the liver and normally leads to death quickly depending on the concentration of the toxin in the food consumed.

These mycotoxins attack many animals including man. Susceptibility of the animals depends on their species, age and strains and natural body immune resistance to attacks by the disease. People whose immunity has been reduced, such as cases with AIDS, the attack is very severe. The occurrence of aflatoxicosis is very common in Eastern Province notably the arid and semi arid regions such as parts of Ukambani and Meru for reasons that are not well understood. These

occurrences concur with famine and drought years when maize is brought into these regions to assist with food shortages. The occurrences are also associated with bumper crops when farmers fail to adequately dry their bumper harvest. It is not economical to think of refrigerating cereals.

The ubiquitous occurrence of fumoniscosis in Nandi was demonstrated by a study conducted at the Moi Teaching and Referral Hospital in Eldoret. Cancer of the oesophagus is slow to kill and victims are spread over wide areas and the deaths it causes do not have a dramatic impact on the population or even government similar to that caused by acute aflatoxicosis which attacks many people within a small area and kills most of its victims.

The conveyance of aflatoxin to humans is via consumption of cereal foods or of milk and other dairy and animal products. When cows consume maize or compounded dairy meal they take in aflatoxins and through their metabolism convert the various aflatoxins from one form to another and eventually secrete them into milk which is then consumed by man. Mothers who consume food containing aflatoxins pass these to their suckling babies. Children under the age of five years are most affected by aflatoxins. The Project **“Safe Dairy Safe Food”** has been designed to survey the concentration of aflatoxins in human cereal foods, Dairy Foods feeds and in cow and human milk. We are also determining the toxins in urine of children under five years of age. The study intended to determine the presence and concentration of aflatoxin in the urine of pregnant and lactating women but we were not authorized to deal with human specimens.

It is therefore the frequency of outbreaks of aflatoxicosis in Eastern Province and fumoniscosis in Nandi that the **“Safe Food Safe Dairy”** Project identified Nandi North (Laboret) and Makueni in the Kambaland as appropriate locations to study the problems of the mycotoxins.

The quadrat for the study subjects included young families who have children under the age of five years, who grow and consume maize, who keep cattle and hence consume milk from their cows which is possibly contaminated with the mycotoxins. Safe Food Safe Dairy also intends to study the effects of the toxins on the growth of the young children. This quadrat is benchmarked in Makueni and Nandi North as suitable areas for the study.

The picture of the Two Benchmark sites

