

Food-grade lime, ash can reduce harmful aflatoxins in grains



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"Soaking maize and other grains in food-grade lime can reduce levels of the micro-organism that causes aflatoxin in maize.

"The process reduces effects of aflatoxin by between 30 to 58 per cent. Food-grade lime is not readily available in the country, but farmers can use maize cob ash," says Dr Elizabeth Wanjekeche, a food technologist at the Kenya Agricultural and Livestock Research Organisation (KALRO) in Kitale.

"Mix the grains with food-grade lime or cob ash before putting them in boiling water for 25 to 30 minutes till the grains loosen up, then wash the grains thoroughly with clean water, while rubbing the maize coats to remove the lime," says the researcher.

After that, the farmer may choose to use the maize to cook *githeri*, or mill the wet grains using a meat mincing machine to get *masa*, a soft product that can be used to make *kebab*, *chapati* or *mandazi*. The grains can also be dried in the sun for two to seven days, depending on the amount of sunshine available, and then milled or stored for later use. The grains should be dried until they attain 13.5 degrees Celsius moisture content level.

KALRO is also promoting the use of *alfasafe*, a biocontrol solution made of roasted sorghum coated with non-poisonous strains of *Aspergillus flavus*, to naturally outcompete their aflatoxin-producing cousins.

Results from Nigeria, where *alfasafe* has been tested since 2007, show a reduction of between 80 to 90 per cent aflatoxin contamination in maize and groundnuts. A similar product being developed and tested in Kenya

and Senegal has returned encouraging results. The Food and Agriculture Organisation (FAO) estimates that 25 per cent of the world's food crops have aflatoxin, which presents a hurdle in improving nutrition. Children below five are the most vulnerable, with exposure to aflatoxins damaging their immunity and causing stunted growth.

Aflatoxins are highly toxic, cancer-causing fungal metabolites that cause immune-system suppression, growth retardation, liver disease and death in both humans and domestic animals. The main fungi, *Aspergillus flavus* which produce these mycotoxins thrive under favourable conditions on a wide range of foods and feed such as maize and peanuts.

Aflatoxin contamination can occur before harvest when the crop undergoes drought stress due to elevated temperatures at the grain filling stages and when wet conditions

occur during harvest. Contamination also occurs when there is insect damage, delayed harvesting and high moisture levels during storage and transportation.

Improper handling of grains leads to moulds which colonise and contaminate food before harvest or during storage, especially if followed by prolonged exposure to an environment with high humidity or to stressful conditions such as drought.

"The mould does not always indicate that harmful levels of aflatoxin are present, but it does indicate a significant risk," says Dr Naftali Busakhala, a physician and senior lecturer at the Moi University.

"Acute aflatoxicosis can cause liver necrosis. Chronic exposure causes hepatitis, cirrhosis and liver cancer. It has also been associated with gallbladder cancer and oesophagus cancer," he adds.