In the recent past, there have been stories carried in the media on aflatoxin in maize and the possible connections to cancer.

Maize value chain aflatoxin mitigation

By Prof. Erastus Kang'ethe

Indeed, it is clear that Aflatoxin contamination of maize consumed and or marketed in Kenya is a recurrent problem. In 1961, about 16,000 turkeys died due to consumption of aflatoxin contaminated groundnut feeds. Other outbreaks affecting animals and humans have occurred ever since, with the 2004 and 2005 outbreak having the highest morbidity (406 affected) and mortality (157 dead) among human population.

Aflatoxin infested maize

In 2010, 2.3 million bags of maize, grown in the Eastern and Coast regions of Kenya, were declared by the Ministry of Public Health and Sanitation as being unfit for human consumption due to high levels of aflatoxin contamination. Maize is the staple food of many Kenyans (98kg/capita/year), such that in this context, when maize is contaminated with aflatoxins and declared unfit for human consumption, this is not only a food safety issue, but it raises food security concerns for the country. Previous outbreaks have also revealed that high levels of contamination were commonly found in highly food insecure areas. Therefore, the two issues of food safety and food security are correlated in more than one dimension.

Aflatoxins are secondary metabolites elaborated by Aspergillus flavus and parasiticus during growth under favorable conditions (including moisture and temperature). Aflatoxins are known carcinogens, causing adenocarcinomas of the liver, which is excerbated by concurrent Hepatitis B infection. They are also known to be antinutritional, mutagegenic, teratogenic and immnunosuppressants. The major toxins are grouped as Aflatoxin B1, B2, G1 and G2. Aflatoxin M1 is a breakdown product of Aflatoxin B1 and is excreted in the urine and milk of exposed humans and animals, Aflatoxin B1 is the most toxic.

In Kenya, until now, control of aflatoxin contamination of maize has relied mainly on testing maize at marketing outlets and withdrawing the contaminated lots. In 2010, for instance, the Government tried to mop out the contaminated maize

Participants during a recent aflatoxin workshop, among them are representatives of FAO, researchers and local millers.

by purchasing the maize from farmers at reduced prizes, a move that was not very successful and came at a high cost. As mycotoxins are ubiquitous contaminants, the internationally recommended approach is based on preventing the contamination, rather than letting it happen and then try to remove the contaminated maize from the market.

It is now commonly agreed that this requires a all-encompassing chain approach, combining contamination reduction strategies at each step of the chain, and implemented coherently by the different stakeholders. In fact, in Kenya, the specific maize value chain is complex and involves many actors. The key actors include the seed developing and marketing companies, research institutions, farmers, traders (assemblers, wholesalers, retailers, and dis–assemblers, posho millers and large-scale millers) and consumers.

At certain times of maize shortages, maize importing companies also become key players in the value chain. From the public sector side, the minsitries of agriculture, health, trade and others are also involved, due to their support to the production, marketing, control and monitoring functions.

In Kenya, until now, control of aflatoxin contamination of maize has relied mainly on testing maize at marketing outlets and withdrawing the contaminated lots

In a sector with many players like the maize value chain, a fragmented approach to the control of aflatoxin is not effective, as gains made in certain sectors could be lost if other segments do not participate in applying the mitigation measures appropriate to their segments. A coordinated approach of the the value chain based on shared awareness of the issues and equipped with mitigation measures appropriate to each segment of the chain, would reap greater benefits for all in the maize value chain.

Solutions to mitigate the impact or prevent the contamination exist; but they need to be evaluated with a wholistic approach, for instance, some may have a "perverse" effect on the long run, like a policy to buy contaminated maize could have a dissuasive effect to producers to apply GAPs specifically aiming at reducing contamination; or some very technical solutions at one stage, could have consequences on other segments of the chain. Therefore, they need to be tested for their acceptance by stakeholders. In addition, as the aflatoxin contamination of maize has been largely echoed in the public arena and has a clear political dimension, there are a number of important projects and inititatives supported by donors and technical and financial partners currently undergoing in Kenya, complemented by Kenyan research.

The issue here is an adequate sharing of information and new data generated and passed on to a wider community of stakeholders that would derive concrete benefits from this information, either at individual or common level.

Therefore, technical solutions at each segment of the value chain needs to be debated and agreed upon by stakeholders to get buy-in, and in some cases, tested to provide science based evidence of their effectiveness in controlling aflatoxin.