



Aflatoxin control in Ghana: Whose responsibility?

The full text of the keynote address given by Professor Richard Tuyee Awuah of the Kwame Nkrumah University of Science and Technology at the official launch of Aflasafe GH02, in Accra, Ghana on the 29th of June, 2018.

Mr. Chairman,

The Honourable Minister of Food and Agriculture,

Members of the Press,

Ladies and Gentlemen:

Aflatoxins are toxins produced by the fungi *Aspergillus flavus*, *Aspergillus parasiticus* and to some extent *Aspergillus nomius*. They occur in a wide variety of food items and are prevalent in countries lying within 40° North and 40° South. Some food crops susceptible to contamination by aflatoxins are groundnuts, maize, copra, tiger nut, sorghum, millet and sesame. When such foods are processed, the aflatoxins appear in the processed products such as groundnut butter, groundnut oil, copra oil, beer, kenkey and other maize-based products. People, fish, poultry and cattle are exposed to aflatoxins when they eat aflatoxin-contaminated foods and feed. It is in this manner that aflatoxins then pass on to breast milk (humans and cattle), cheese, pond-raised fish, meats, faeces, urine, semen and blood.

Aflatoxins have tremendous impact on human and animal health. Most importantly, they are well known as liver toxicants, affecting liver function which, with chronic exposure, may lead to liver cancer. Acute exposure to aflatoxins could result in outright death. In Ghana, some of these problems have been reported.

Various countries have established permissible aflatoxin levels in their foods. For EU countries, it is 4µg/kg, 20µg/kg for all foods (except milk) in the USA, and 20µg/kg (raw groundnuts) and 15µg/kg (maize) for Ghana. The FAO and WHO have a limit of 30µg/kg and Codex Alimentarius Commission 10µg/kg for all processed foods.

Aflatoxins erode food security as contaminated food may be taken out of the food chain, decreasing the amount of food available for consumption.

Export trade in food items may also be severely hit by aflatoxin contamination since an importing nation will not permit importation of foods with aflatoxin levels above their permissible threshold. Unless the aflatoxin issue is well managed in Ghana, the country's export trade in some commodities will continue to suffer. Aflatoxin contamination is a health, trade and food security issue in Ghana, needing urgent remediation.

Traditional approaches to managing aflatoxin contamination in maize and groundnuts are essentially based on proper postharvest handling such as drying to 6–8% moisture (for groundnuts) and 12% (for maize). This is not always successful due to unsuitable drying facilities and unreliable postharvest handling infrastructure.

Since aflatoxin contamination also occurs in the field, it is necessary to look at other options that target the problem in the field. One such option which has been tried successfully elsewhere is biological control with atoxigenic strains of *Aspergillus flavus* from Ghana's own crops and soils. Using these native atoxigenic strains, a biocontrol product *viz.* Aflasafe GH02 has been developed for Ghana as part of a PhD Thesis work by Dr Daniel Agbetiameh in collaboration with KNUST, IITA and USDA-ARS lab, University of Arizona (USA). This product has been tested widely in Ghana and has been shown to reduce aflatoxin contamination by 80–100% in the field. This year (2018), it was registered by the EPA for use in Ghana.

Aflasafe GH02 has the following characteristics. It is:

- not a genetically modified product
- low cost to use (\$ 18.75/ha)
- not toxic
- easy to apply in the field

Currently, Aflasafe GH02 is being manufactured at IITA, Ibadan, Nigeria and must be imported into Ghana. Local production and distribution options are being explored. In this presentation, I am required to assign responsibilities for the control of aflatoxins in Ghana. So what I intend to do is to identify some key areas in aflatoxin management and suggest some organizations, sectors and individuals who might be responsible for carrying out those actions.

The main reason for our meeting here today is to launch this novel product, the use of which will be a key aflatoxin control option in Ghana. Whether or not the product will be successful in Ghana will also depend in part on the publicity and perceptions we Ghanaians give it. If it is given bad publicity and is labelled as a GM product as some Ghanaians and the Press did (for political expediency) with the Plant Breeders Bill, it will trigger negative reaction from the Ghanaian populace who are wont to label anything novel as Aflasafe is as GM. You will recall that the Plant Breeder's Bill received the GM label whereas it had nothing to do with GM. Up till now the Bill has not seen the light of day. Let us not do so with Aflasafe. Instead of tearing it down, it should rather be the duty and responsibility of the press and, as a matter of fact, all of us here to promote its use for aflatoxin control.

In the short to medium term, private-sector participation in the importation and distribution of the product in Ghana, as done for other agricultural inputs such as fertilizers, pesticides, seeds etc. will be in order. In the long term, the possibility of the GOG or even the private sector either on its own or in partnership with the GOG to establish an Aflasafe plant in Ghana should be explored. I understand that in Senegal, an Aflasafe plant is being put up through a private-sector endeavour. The same can be done for Ghana.

Aflatoxin contamination of crops (maize and groundnuts) is both a pre-harvest and post-harvest issue. The problem starts in the field and continues in storage if ideal post-harvest handling of the crop is not guaranteed. In the field, the best method for aflatoxin control

would be use of aflatoxin-resistant crop cultivars. Unfortunately, such crops are absent in Ghana. The most common maize cultivar (Obatanpa) and groundnut cultivars (F-mix, Chinese etc.) are all prone to aflatoxin contamination. This means agriculturists, especially plant breeders, have the responsibility to come out with new cultivars resistant to aflatoxin contamination. Though the universities should not be left out of this, the CRI and the SARI, both of them CSIR institutes, should lead in this effort. Though these two Ghanaian research institutions have played pioneering roles in developing and releasing maize and groundnut cultivars with good agronomic characters and with resistance to certain crop diseases (which I acknowledge here), they are yet to develop any crop with resistance to aflatoxin contamination. Aflatoxin was discovered in 1960 in the UK and the first published report from Ghana was by one Beardwood in 1964. Forty-four years on, we do not have any aflatoxin-resistant maize and groundnut cultivars in Ghana for use by Ghanaian farmers. Plant breeders at CRI and SARI and the Universities are urged to redouble their efforts to remedy this unfortunate situation. It is heartwarming to note that recently, an aflatoxin-resistant groundnut variety was developed by ICRISAT scientists. What prevents Ghanaian plant breeders from forging collaborations with their ICRISAT counterparts to develop similar varieties for Ghana?

Farmers too have a great responsibility in mitigating aflatoxin contamination by using good agricultural practices. Despite the usefulness of Aflasafe, we will continue to stress good agricultural practices (GAP) in aflatoxin mitigation. GAP and Aflasafe should be used in an integrated manner. Thus, farmers should avoid planting in termite-infested soils, avoid late planting and also avoid late harvesting of their crops. These are among the practices that exacerbate aflatoxin contamination of maize and groundnut crops. Once harvested, maize and groundnuts should be rapidly shelled and dried down rapidly to low moisture levels; this is the responsibility of the farmer. It is also the responsibility of the farmer to ensure proper packaging and storage of their crops when dry, as improper storage would result in fungal growth and aflatoxin contamination.

A good majority of Ghanaians are unaware of aflatoxins. At best, the level of awareness of the subject in Ghana is low. Thus, awareness creation is necessary. The media bears the greatest responsibility in this effort. Media men and women themselves ought to be conversant on the subject of aflatoxins. This is where we need the GJA most in service of public interest. It has been done before. To cite a recent example, the GJA took a strong stand against illegal mining (Galamsey) in Ghana. I urge GJA to do similarly in support of efforts to mitigate aflatoxin contamination through awareness creation.

The GES should also take up part of the responsibility in awareness creation on aflatoxin. I teach Mycology to first-year university students. Most, if not all, have never heard of aflatoxins, let alone the fungi which produce them and the potential harm they can and do cause. Is it not the GES which is best positioned to include some aspects of aflatoxins, if even briefly, in the science syllabi to be taught in High Schools in the country, I may ask? If this is done, it will greatly enhance aflatoxin awareness among the students at a very early stage in life.

MoFA extension officers should not be left out in the creation of awareness on aflatoxin. They are, after all, the frontline staff who interact with farmers and are therefore important stakeholders and direct actors as far as aflatoxin management efforts through awareness creation in Ghana is concerned.

Ghana lacks a robust and well-developed regulatory and monitoring framework for aflatoxins and their contamination of human and animal foods. This must be remedied as a matter of urgency. Establishing the framework should be a joint responsibility of the relevant stakeholders such as the PPRSD of MoFA, the Food and Drugs Authority of the MOH and the Ghana Standards Authority. To properly monitor and regulate aflatoxins, Ghana would have to improve her capacity for detecting and monitoring the toxins in foods so that only safe foods are permitted on the market. Accredited labs for aflatoxin testing is one essential ingredient for this activity.

I am of the view that as a nation, we will have to put in place an Aflatoxin Control Action Plan which, among others, will clearly define aflatoxin management options for Ghana. I am therefore calling for the establishment of a national Aflatoxin Working Committee whose main responsibility would be to put in place the action plan and see to its implementation. This action plan should, to a great extent, be modelled after the PACA plan (2014-2024). The composition of the national Aflatoxin Working Committee should have representations from the relevant stakeholders such as the Universities, FBOs, MoFA, Ministry of Health, Research Institutes and the Ministry of Trade and Industry. This can be done. After all, hasn't MoFA established a Biosafety Committee to superintend over GM crops in Ghana? The same should be done for aflatoxins.

The Ministry of Health, the Ministry of Agriculture and the Ministry of Trade should also actively and demonstrably incorporate aflatoxin issues into their development policies if they are not already doing so.

Transport owners and drivers should ensure proper haulage of aflatoxin-susceptible foods such as maize and groundnuts especially during the rainy season. Such crops should be placed on pallets in the truck and covered with tarpaulin to protect them from moisture elevation and mould aflatoxin synthesis in the event of rain.

As we go into the panel discussion, let us ponder some of the issues I have raised, add to them and let us synthesize ideas on how best we can manage aflatoxin contamination in Ghana. Again, I reiterate that we all each have a role to play in controlling aflatoxin in Ghana, even as some sectors in our society bear greater responsibility than others, especially those who are key influencers also charged with protecting public interest, such as the government and the media.

I thank you all for your attention.

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