Hungry Bellies and Silent Killers: Why both Quantity and Quality Matter in Food Security

 [What Innovations in Food Production Are Likely to Have Significant Impact in the Next Decade?](https://www.worldfoodprize.org/index.cfm/88533/18106/what_innovations_in_food_production_are_likely_to_have_significant_impact_in_the_next_decade) | [Main Page](https://www.worldfoodprize.org/en/newsroom/the_borlaug_blog/) | [Turning livestock herders into citizen-scientists: the mobile phone leapfrog into the information age](https://www.worldfoodprize.org/index.cfm/88533/18107/turning_livestock_herders_into_citizenscientists_the_mobile_phone_leapfrog_into_the_information_age) 

**By Charity Mutegi
Research Scientist working for the International Institute of Tropical Agriculture (IITA)**

What do you look for at the market or the grocery store? Do you seek out food that offers good value for money or the best taste?  Would you rather have a large helping or a dish that looks appealing? Amongst all these decisions we grapple with, one thing is easily taken for granted: that the food we eat should neither make us sick nor damage our health. Food that harms us negates the very essence of why we eat and what food should be. Basic safety is the least we deserve, yet we have witnessed people die from the lack of it.

Our history of hunger and starvation on the African continent has given many of us a skewed perception of food security: our subconscious target is to fill every belly. Food security should however, rest on four pillars, straddling both quantity and quality. It requires *availability* of sufficient food and its *accessibility* where it is needed, but equally important are the elements of *nutrition* and *safety*. Food safety is often overlooked, and quality considered synonymous with nutritional content. Certainly, valuable research combining nutrition and agriculture, from diversified cropping systems to nutritionally-enhanced crop varieties, is helping resource-poor people access healthier diets. However, the quality of a food is not a fixed attribute, and even the most nutritious crop can become harmful in the absence of good agricultural and manufacturing practices.  What is the use of a plentiful harvest if eating it does us harm?

Critical disciplines in agricultural organizations are key in ensuring food quality and safety. They include food science, postharvest management and nutrition. Unfortunately, their numbers are lean in many of such institutions compared to those mandated to increase crop and livestock productivity.  A quick mental tally in such organizations will bring this fact closer home.

A major food safety concern that threatens to negate the gains in crop and livestock productivity is aflatoxin contamination in crops and subsequent exposure in man and animals. Aflatoxin is produced by certain strains of *Aspergillus flavus*, *A. parasiticus*, and related fungi. These fungi grow and produce toxins on many foods, including maize (corn), the most important staple in sub-Saharan Africa, and groundnuts (peanuts), a key addition to staple starches and a constituent of infant and therapeutic foods used globally. During an aflatoxicosis outbreak in eastern Kenya in 2004–5, over 125 people died after consuming contaminated maize. As recently as 2016, 65 people were affected and 19 died in Tanzania after consuming contaminated maize. The majority of sub-Saharan inhabitants are chronically exposed to aflatoxin, most without ever realising – even though accumulation in our bodies leads to cancer, immune suppression, and stunting in children-. The impact is dire, shortening lives and depriving productivity and happiness, coupled with a high societal cost of managing long-term illnesses.

Since aflatoxin contamination largely affects our staples, we might expect some reprieve from the nutritious green leafy vegetables, widely grown across the African continent. In our quest to choose the best we obviously target the dark green leaves with no sign of damage, largely sold in open-air markets where traceability is next to nil, but prices are favourable. The outcome? We compound aflatoxin exposure with exposure to pesticide residues – overused and under- regulated  – and heavy metals, found in high concentrations from effluents that trickle into systems where crops are grown, many of which are carcinogenic. This notwithstanding, staggering amounts of dangerous antibiotic residues in meat sources are gradually being unearthed. A recent study by one of Kenya’s leading public universities that was reported this year in the Daily Nation illustrates how grave the matter is in the country after large doses of antibiotics were found in beef, pork and chicken dishes in parts of the country. This is however not unique to Kenya, a fact that can be laid bare by a critical look at reports of similar products, east or west.

The situation is grimmer when we consider that only a meagre population in the African continent has access to adequate and clean water for drinking and food preparation among other uses. According to several entities working on availing safe water across the globe, while about 10 per cent lack access to safe water globally, this statistic increases to over 40% in many countries in Africa, with an even greater number having no access to improved sanitation. In Kenya for example over 60% of the population lacks access to improved sanitation, with more than 5000 children under 5 years in the country dying each year due to diarrhoeal diseases caused by poor water and sanitation standards. As noted, it pits the number of people who own cell phones as being more than those who access improved sanitation!  Due to water scarcity, those economically advantaged result to sinking boreholes in the absence of reliable tapped water, but rarely test water quality. It is common knowledge that a significant proportion of the SSA population gets their water from rivers polluted with effluent from industry and agriculture; soaps and detergents; and human and animal waste. The result is exposure to heavy metals, toxic chemicals, and a range of waterborne diseases. As I write this blog, parts of my country are emerging from a cholera outbreak – with resultant fatalities – yet the national news media has already moved on to other matters.

Aflatoxin, routinely found in dangerous quantities in foods across sub-Saharan Africa, illustrates the dilemma of plenty versus safe in the African context. The fungus responsible colonises crops while they are growing, and continues to produce toxins even after harvest. It can sometimes appear as a surface mould but often shows no outward sign. This makes it difficult to accept the fact that not all foods that look good are safe to be eaten. Therein lies a challenge in promoting aflatoxin reduction technologies because there is no obvious distinct visual difference between clean and contaminated food.  This is in contrast to the use of fertiliser or a new variety to achieve higher yields where the effect on the crops is pretty obvious. Also a few improvements in quality are equally evident, such as the enhanced pro-vitamin A content that gives a golden orange hue to crops such as cassava, maize and rice. Unfortunately, aflatoxin reduction, like many differences in nutrition and safety, is invisible. In a reversal of the fairy tale, the emperor looks naked but really is wearing a fine new suit!

Raising awareness about safety concerns is therefore paramount, and must go beyond our traditional focus on farmers. Amongst those who know that aflatoxin can kill, many assume that they have escaped exposure and impact by being alive. I see these same people transformed once they understand how chronic exposure can affect their health. Sufficient demand for safe and nutritious food among ordinary consumers will incentivise its production and monitoring throughout the value chain.

Alongside efforts to improve productivity, the agricultural research community must accommodate more technologies and innovative research aimed at enhancing food safety and nutrition. This can be attained by mainstreaming research in these areas within institutional core mandates, increased resource allocation, and engagement of requisite expertise. In addition, the value for knowledge, information and technologies generated will only be realized once they are moved from the libraries to end users. Such outputs ought to be supported by an enabling environment of good infrastructure, working policies that speak to food quality concerns, regularity mechanisms that should be enforced and frameworks for routine monitoring and surveillance to accommodate both formal and informal establishments. In addition, politically stable environments where effective extension services, advocacy/information dissemination platforms, incubation platforms and access to financial services and market access exist is key.

Worth noting are the efforts that several institutions and bodies have made to address some of the concerns raised here. They include those with a global mandate such as WHO, FAO through joint efforts or organizational based initiatives, others with a regional mandate such as Common Market for Eastern and Southern Africa (COMESA), the East Africa Community, Economic Community of West African States (ECOWAS), and African Union, North-South collaborations and numerous country based initiatives that are multi-sectoral involving public health, agriculture, universities,   environment, among others. Every single effort must be accompanied by a barometer of checks and balances to accommodate the volatility and dynamism of the multifaceted food quality concerns.

A full belly should sit within a healthy body. Food is essential to life, yet it is almost impossible to eat safely in much of Africa – and right there lies the paradox of achieving meaningful food security in our continent. Our bodies are like ticking time bombs, potentially counting down to a health disaster. Silent killers like aflatoxin and other toxic compounds introduced into our bodies in minute doses over time are the most elusive, but by thwarting them we stop those clocks.