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Nutrition challenge in Africa (Under-nutrition, over-nutrition, food safety and health)

Prof John H. Muyonga

Position: Dean
Institution: Makerere University

Africa is the epicentre of under-nutrition, nutritional deficiencies, food poisoning and has in recent decades also registered marked rise in prevalence of over-nutrition and associated non-communicable diseases. Over 20% of Africa's population face chronic hunger and approximately 30% of children below five years on the continent are stunted as a result of chronic under-nutrition. Prevalence of vitamin A deficiency and iron deficiency anaemia are estimated at 30% and 59%, respectively among children aged under five. It is also estimated that 39% of women of reproductive age suffer from iron deficiency anaemia. The high prevalence of under-nutrition and nutritional deficiencies has been linked to poor mental development among children, leading to low productivity in adulthood. It is also linked to approximately half of mortalities recorded among under-fives. Under-nutrition in childhood also increases the risk for developing non-communicable diseases in adulthood. In adults, under-nutrition and nutritional deficiencies lead to low productivity and poor health. Among women of reproductive age, under-nutrition and nutritional deficiencies are associated with poor pregnancy outcomes.

Food safety problems exacerbate consequences of malnutrition, as malnourished individuals have reduced immunity. The fact that Africa has the highest per capita food poisoning incidences, with approximately 91 million cases annually, corroborates the association between these challenges. Africa's food safety challenges include acute cases, mainly associated with microbial food poisoning, as well as toxicity from mycotoxins, heavy metals and pesticide residues, whose effects are observed after chronic exposure. Diarrhoeal diseases associated with microbial food poisoning are a leading cause of malnutrition among children aged 6-59 months. Improved food safety can, therefore, contribute to curbing malnutrition among children. With respect to mycotoxin contamination, over half of maize sampled in a number of countries have been found to have aflatoxin contamination higher than permissible levels. This poses a serious health risk to Africa's population, since maize is consumed by over 70% of the continent's inhabitants. High aflatoxin contamination levels have also been reported for groundnuts, another crop widely consumed on the continent.

Alongside the high prevalence of under-nutrition, nutrition deficiencies and food safety problems, Africa is faced with rising cases of over-nutrition and associated non-communicable diseases. The prevalence of obesity increased from 7.9 in 2000 to 12.8% in 2016. Approximately 10% of people aged above 18 years in Africa live with diabetes. Prevalence of cancers and coronary heart diseases are also on the rise. The rise in obesity and incidence of non-communicable diseases is partly attributable to nutrition transition, characterised by the replacement of traditional with western diets.

Under-nutrition, nutrition deficiencies, over-nutrition and food safety challenges are major impediments to Africa's development, as they affect the continent's most important factor of development, her human resources. There is therefore dire need for urgent and concerted efforts to address these challenges. Addressing these challenges requires contribution of multiple actors. There is, therefore, need for urgent and effective sensitisation and education of different actors, including policy makers, farmers, food handlers and the general population of the extent and impact of under- and over-nutrition, nutritional deficiencies and food safety as well as the available options for addressing these challenges. Education of smallholder farmers (who produce the bulk of Africa's food) on post-harvest handling of foods and supporting them with adequate storage infrastructure and equipment, can for example, contribute to reduction in prevalence of mycotoxin contamination and lowering of food post-harvest losses. It is estimated that about 30% of food produced on the continent is lost post-harvest. For even better results from education on post-harvest handling of food, there is also need to support farmers and other value chain actors to improve their access to post-harvest handling facilities. Community silos and grain receipt program, for example, provide farmers with a safer option for storing their produce.

Nutrition education, on the other hand, has potential to contribute to adoption of healthy eating habits, potentially contributing to reduction in obesity, under-nutrition and nutritional deficiencies. For many countries in Africa, there is paucity of effort and actors in food safety and nutrition education. There is therefore need for additional investment in food safety and nutrition education. Universities, governments, non-governmental agencies and private sector should consider increasing their contribution towards addressing this need. Investments need to be made into interventions already known to be effective in combating malnutrition, such as promotion of recommended infant feeding practices, de-worming and vitamin A supplementation for children, supply of iron supplements to pregnant mothers, food fortification, promotion of local micronutrient dense foods, and community screening for and rehabilitation of the malnourished. Given the enormous burden of malnutrition and food safety problems to Africa, the continent should be at the forefront of finding new and more effective solutions to food safety and nutrition challenges. There is need to explore home-grown school feeding programs as well as social safety net programs that enable the most underprivileged, including the elderly and refugees access adequate food. There is also need for more countries on the continent to develop, adopt and popularise national or regional dietary guidelines covering different population categories. Given the increasing prevalence of over-nutrition, the guidelines need to include recommendations to prevent this epidemic. Technologies for keeping food safe without refrigeration as well as innovative approaches for promoting safe food handling should be explored.

Food poverty is a main contributor to under-nutrition and nutritional deficiencies in Africa. To improve nutrition among the food poor requires increasing food availability, access and stability. Resource poor farmers, who constitute a high proportion of the food poor, require support to improve their productivity. Climate change and depleted soils have increased the vulnerability of this group. There is therefore urgent need for interventions aimed at enabling resource poor farmers in Africa to improve their agricultural productivity, especially for nutrient rich products. Given their limited access to production resources, these farmers require options based on agro-ecological intensification (AEI) principles. Promotion of resilient nutrient rich crops and small animals has potential to contribute to improved food production by resource poor farmers. Candidate crops include traditional vegetables, traditional fruits, including fruit trees, small seeded cereals and pseudo-cereals and a variety of legumes and tuber crops, while candidate animal species include local poultry, goats, sheep breeds, pelagic fish species, among others. The re-introduction of these commodities into Africa's food system has potential to boost food security and nutrition, since they contribute to agro-biodiversity and because of their superior nutritional and agronomic characteristics. However, supply of quality seed, production and post-harvest handling knowledge and technologies that reduce drudgery are some of the hurdles that need to be addressed to support increased production of such crops. Alongside the promotion of the underutilised species, wider adoption of biofortified varieties of the more widely grown species such as

common beans and orange fleshed sweet-potatoes have potential to contribute to the alleviation of micronutrient deficiencies. Universities and other actors need to consider contributing more to identifying and promoting interventions that enhance agricultural productivity and the production of nutrient rich foods. Research on seed systems, sustainable primary production, post-harvest technologies, socio-economics and convenience in utilisation, could help enhance the adoption of the currently underutilised nutrient rich species. The pursuit of sustainable solutions to current food supply challenges faced by Africa should entail exploration of indigenous knowledge and technologies.

In addition to primary production and post-harvest handling, Africa needs to promote nutrition sensitive food processing. With increasing urbanisation on the continent, the demand for convenient processed foods is on the rise. Historically, processed foods have mainly been over-refined and laden with sugar and fat. Processed foods have therefore contributed to the rise in overweight and obesity globally. For food processing to contribute to the alleviation of malnutrition in Africa, there is need that the development of food processing on the continent follows a trajectory towards healthier products. Food processors should consider developing foods that are convenient, low in glycemic index, high in nutrients, fibers and bioactives. The food industry also needs to develop nutritious foods that target nutritionally vulnerable groups, including complementary foods for infants and children as well as therapeutic foods for the sick.

The hotspots for food insecurity and under-nutrition in Africa normally include areas afflicted by conflicts and those with extreme weather conditions. Most of these areas can neither produce adequate volumes of own food nor afford to procure food from other sources. Africa can greatly reduce the prevalence of under-nutrition by averting conflict, and this is largely a governance issue. Improvement in governance is therefore core to the alleviation of under-nutrition on the continent. The solution to the challenge of extreme weather conditions, to a large extent, also lies with governments. The poor inhabitants of the drylands in Africa cannot, by themselves, afford technologies such as irrigation, required to enable them produce adequate food. Governments should consider investments into water supply infrastructure for areas with very limited rainfall, to facilitate agricultural production by the inhabitants. Government investment is also required in cases of plant or animal disease epidemics to avert the negative impact of these on food production. Additional government investment in agricultural research, in food distribution and food handling infrastructure, in strengthening agricultural value chains are some of the options with potential to markedly foster food and nutrition security. Governments also need to strengthen regulatory controls in the food supply system in order to alleviate practices that make food unsafe. Unsafe pesticide use and the widespread cases of food adulteration by food value chain actors also need to be addressed urgently, to protect the population from the health consequences of consuming food laden with toxins. Governments in Africa need to strengthen regulatory agencies that oversee food safety and these agencies need to pay as much attention to food consumed on the local markets as they do to food for export. Governments also need to support private food value chain actors to develop the capacity required to supply quality food.

The food safety and nutrition challenges faced by Africa are enormous but not insurmountable. To alleviate these challenges Africa needs sustained efforts by a diversity of actors. Governments, non-governmental agencies, researchers, the private sector and the citizenry need to partner to facilitate investment in sustainable and nutrition sensitive agriculture. There is need to invest in technological and social innovations that enhance the efficiencies of food value chains. Sensitisation and education of different stakeholders should be embraced as it has potential to play a catalytic role in fostering healthy consumption, reduced food loss and higher agricultural productivity. There is also need to explore ways for improving food access for those most vulnerable to food and nutrition insecurity, including the development of road infrastructure and transportation. There is justification for increased investment in improving food safety and nutrition, since the potential returns that include a healthier and more productive population, are arduous to match. This message needs to reach policy makers in governments and in different institutions. Let's all help spread it.

ABOUT THE AUTHOR

Dr. John H. Muyonga is the Dean of School of Food Technology, Nutrition and Bio-Engineering at Makerere University in Uganda. Prior to that, he was the Head of the Department Food Science and Technology which has since been renamed Food Technology and Nutrition. He has been a faculty member. He has taught a number of undergraduate and graduate courses and is heavily involved in research. His primary research interest areas include food protein chemistry, nutraceutical properties of traditional foods in Uganda, improvement of traditional food processing methods and food product development. His other interests include commercialization of research and nutritional interventions. In addition, he has extensive consulting experience, and has worked with a number of entities and projects in various consulting roles. He holds a PhD in Food Science from the University of Pretoria in South Africa. Prior to pursuing his doctorate, he earned an Advanced Certificate in Food and Nutrition from the United Nations University in Japan, an MSc in Food Science from Cornell University in the United States and a BSc in Food Science and Technology from Makerere University.

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