



The Hidden Cost of Cheap Food

Most residents of developed countries have ready access to food that is fortified with nutrients and free of contamination. For people in developing countries, that is not the case. Many people lack resources for defining a healthy diet or learning about its benefits; finding and purchasing healthy food can be an enormous task in itself. Dr. Vivian Hoffmann of the University of Maryland looks at the impacts of poor nutrition in developing countries and emphasizes the need for education and outreach.

AT A GLANCE

- Fortified, uncontaminated food is essential to healthy human development.
- Much preventable morbidity and mortality in Africa is caused by the lack of access to healthy safe food.
- Doses of supplements are typically very affordable and small.
- Lack of consumer awareness of the importance of micronutrients is a challenge to behavior change.
- Identifying viable business models for small-scale food fortification in rural areas may improve the situation.

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PHOTO: SAMUEL MUTIGA

Kenyan woman drying corn cobs from her farm. Drying crops directly on the bare earth exposes them to dangerous fungi that may be present in soil and thrive in hot, humid climates.

Walk down the aisles of any grocery store in a developed country and look around: almost all food items are fortified with additional nutrients (and if they are not, the packaging tells us so). Common salt is iodized; bread uses enriched flour; standard packaging requirements tell

us the ingredients in frozen meals. In the United States, it is straightforward to learn about daily nutrient intake. Government and news sources reveal the daily recommended amounts of vitamins, proteins, calcium, zinc, iron; food product labeling tells us how much of these nutrients they pack in. Even the

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- Mycotoxin contamination of food is also a serious health challenge, but is not well-understood.
- Public sector certification of food products may help in providing safe food in rural areas.



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Iodine deficiency affects about two billion people; is the leading preventable cause of mental retardation; and can cause thyroid gland problems. Iodization of Salt is an inexpensive way to prevent iodine deficiency.

mixture of chemicals (pesticides, fertilizers, etc.) used in the production and preservation of foods is controlled; federal restrictions filter out harmful chemicals before the food arrives on the dinner table.

Things are not so rosy in developing countries. Information about what constitutes a proper diet is difficult for the average low-income earner to find. If a person could gather this information, she could not easily go to a market to pick out the items which she needs because nutritional information is usually absent, even on packaged food. To complicate matters, the chances of chemical toxins being present in the food are significant. A central monitoring agency may not be present to implement national food standards. The population may be ignorant to the harmful effects of chemical toxins or the benefits of micro-nutrients; hence, there is neither the demand for fortified or toxin-free food, nor the supply.

But is this really an issue? Do micro-nutrients matter? And how harmful are residual chemicals? Dr. Vivian Hoffmann, a researcher with the University of Maryland's Department of Agricultural and Resource Economics, reviewed a variety of studies to convincingly argue that micro-nutrient deficiency impedes the growth and development of an individual and, hence, a society. Consider Iodine, an essential micro-nutrient. The average human needs a trace amount of iodine daily. Iodine deficiencies can lead to mental retardation and hormonal problems. Lack of iron intake during infancy has long-term effects on human cognitive, motor, and social development. Anemia, which is a prime result of iron deficiency in adults, is known to weaken a person and impede stamina and productivity. Anemia leads to a weak immune system and susceptibility to a variety of diseases, as do deficiencies in vitamin A and zinc.

One study using data from ten developing countries showed that iron deficiency anemia contributed to a four percent reduction in gross domestic product (GDP). Another study estimated that anemia, along with deficiencies in vitamin A and zinc account for nineteen percent of global child deaths, which is more than double the lives claimed by the more celebrated killer, malaria.

So what options are available to address these deficiencies? Iodized salt has solved the iodine deficiency problem to a large extent. It adds the essential micro-nutrient to a cheap and necessary food item, which is consumed regularly by most people. Indeed, seventy percent of all households in developing economies consumed iodized salt in 2000, as opposed to just twenty percent in 1990. Consequently, incidence of iodine deficiencies fell from thirty to fifteen percent in these regions over the same decade. But the problem still remains in parts of the world where people buy salt from small manufacturers, who find the cost of iodine fortification prohibitive.

Iron naturally occurs in meat and vegetables, but these are often too costly for sufficient consumption by impoverished families. Iron fortification of a staple food item offers a solution, thus ensuring that even poor households get their daily requirement. For example, a number of countries fortify flour to overcome iron deficiencies. Challenges remain however, as the costlier fortified variety is unattractive to those not aware of the benefits of iron supplements.

As Dr. Hoffman describes in her findings, people must be informed about the benefits of essential micro-nutrients (or the harm from

not having them; fear is an excellent motivator). Fortified food will always be costlier than unfortified equivalent, but this cost is typically smaller than the cost related to health effects from nutrient deficiencies. Government administrations should pass laws that require fortification and provide incentives to manufacturers to provide fortified food at a cost no higher than unfortified alternatives. This corrective approach—educational outreach to boost demand and government action to boost supply—should help ensure that rates of deficiencies would fall.

Contaminated food also negatively affects the health of people who live in developing countries. These contaminations can be broadly categorized into agro-chemical residues (left over from pesticide and fertilizer treatments) and biological contaminants produced naturally in plants or introduced by pests. As Dr. Hoffman observes, farming throughout the world is becoming less labor intensive; higher yielding seeds and mono-cropping may require increased dosages of chemicals. Lack of regulation, lax enforcement, and price sensitivity all lead to the use of older, cheaper, and generally more acutely toxic and environmentally persistent chemicals that tend to stay in the human body and act as carcinogens.

A type of contaminant called aflatoxin is of particular concern. The fungus which generates aflatoxins is present in the soil and encouraged by pest infestations. At low levels of exposure, aflatoxin increases the chances of liver cancer. At moderate levels, it damages the immune system and retards child development; at high levels, it leads

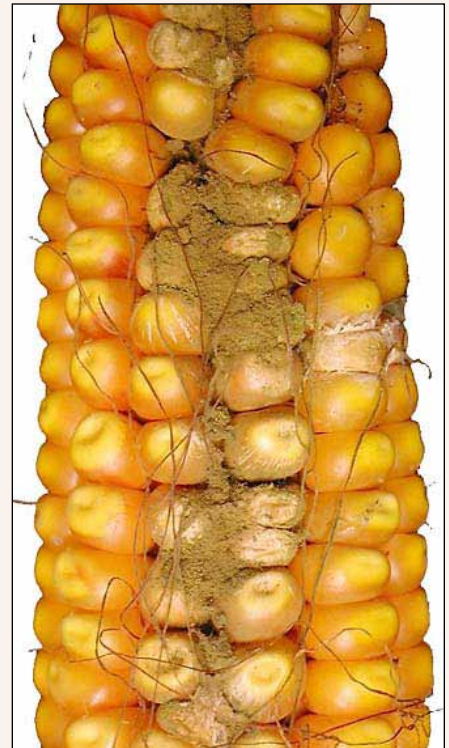


PHOTO: SAMUEL MUTIGA

The fungus on this corn produces aflatoxin, a very potent naturally-occurring substance. Aflatoxin causes liver cancer and suppresses immune system function. Over a third of the Kenyan corn samples collected by Dr. Hoffmann were contaminated with this toxin.

to liver failure and death. In sub-Saharan Africa, aflatoxin exposure and hepatitis B cause 75 percent of the 200,000 liver related deaths each year.

People in developing countries are generally unaware of aflatoxin contamination. Visibly damaged crops that are more likely to contain aflatoxin are often removed and used as feed for animals or used to make alcoholic beverages. However, aflatoxin both affects animal health and is passed to humans through consumption of animal products and fermented beverages. Furthermore, aflatoxin itself is invisible, and unblemished crops may contain



Dr. Vivian Hoffmann

high levels of the toxin, and the most vulnerable families are anyway reluctant to discard grain.

According to Dr. Hoffman, farm management strategies could reduce this problem. Yet since aflatoxins are biologically produced, preventative strategies are not foolproof. Droughts, pest damage, and insufficient plant nutrition contribute to fungal growth. Post-harvest, improper storage could promote contamination.

It is important to understand and quantify the tradeoffs that farmers, especially subsistence farmers, are willing to make between food safety vis-à-vis higher yields and easier storage. This could help inform public and private investment in developing crop varieties that are fungus resistant and have other attractive qualities such as high yield and drought tolerance. Once again, educating the population about the effects of aflatoxin contamination is of paramount

importance. Ultimately, awareness of the health implications of fungal contamination may shift this balance in favor of better-storing varieties.

Dr. Hoffman emphasizes that micro-nutrient deficiencies and invisible biological contamination are threats to human health and consequently place a medical burden on society. Informing people about their effects is necessary. Once a person realizes that ignoring contamination or nutrient deficiency is probably harmful and potentially fatal, they may be willing to pay a higher price for better quality. In turn, this will provide incentives for producers to deliver better and healthier food, and will help in solving these problems. ■

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