

# The Critical Role of Food Safety in Ensuring Food Security



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## **Dave Crean**

Vice President of Corporate Research and Development, Mars, Incorporated



## **Amare Ayalew**

Program Manager of the Partnership for Aflatoxin Control in Africa (PACA), the African Union Commission

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*“Partnership with the private sector to improve food safety globally is critical. FAO recognizes this and engages with the food industry at national and international levels to both leverage and disseminate knowledge that will promote effective food safety practices along the food chain. Food safety is complex, and addressing food safety issues requires a multisectorial approach.”*

*Ren Wang, Assistant Director-General of FAO's Agriculture and Consumer Protection Department.*

## Key messages

- Today's global food supply chains make the food safety landscape more complex and challenging than ever before. Food safety management has not kept pace with this development.
- Unsafe food cannot sustain human health and has tragic social and economic consequences.
- New food safety threats are emerging. Aflatoxin is a particularly good example: the health and economic effects of aflatoxin cause devastation, especially for the world's poorest.
- Improving levels of food safety globally requires the development of new technologies, sustainable commitments, and human and institutional capacity, especially among farmers.
- Collaboration among all stakeholders is necessary to leverage the right food safety knowledge, risk management methods and interventions across the global food supply chain.

## Food safety: the context

Ensuring safe and nutritious food for all is arguably one of the key public health challenges of our time. The safety of the food we consume directly influences our health, but its significance within the broader food supply system can scarcely be overstated. The economic implications (and impacts) of food safety are clear, and have been extensively documented.<sup>1,2</sup>

While the discipline of food safety has long been discussed and researched, its link to food security has yet to be fully appreciated. The UN Food and Agriculture Organization (FAO) defines food security in the following terms: “Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.”<sup>3</sup>

This is a deeply insightful definition, and should not be simplified. Food security has often been conceived merely in terms of having sufficient food. Nutrition and safety – critical components of that definition – are often afterthoughts, and in some instances are simply forgotten. The decoupling of food safety and food security is sometimes so overt that terminology such as “nutrition security” has emerged, perhaps in an attempt to compensate for the lack of focus on anything more than the sufficiency aspect of food security. Yet all the elements of food security, including safety, must be addressed simultaneously in order to achieve the goal implicit in the FAO definition.

## Food safety: the global impact

The latest data from the World Health Organization (WHO) suggests that each year, foodborne illnesses cause almost one in 10 people on the planet to fall ill (Figure 1). Some 420,000 deaths a year are believed to result from foodborne illnesses, a significant proportion of these in children less than five years old.<sup>4</sup> Contaminated food causes some 230,000 diarrheal deaths a year; this is the best estimate of the global impact of foodborne illness that we have yet seen, and represents a heroic effort on the part of the WHO, having required 10 years to compile. This figure may nevertheless still be an underestimate.

The US Centers for Disease Control and Prevention (CDC) report from 2011, which focused on the United States, and attempted to compensate for the under-reporting inherent in the data, estimated that one in six people in the US is a victim of foodborne illness, with 3,000 related deaths each year.<sup>5</sup> If we were to simply extrapolate the CDC data to the globe, that would suggest that approximately a billion people suffer from some variety of foodborne illness each year. Obtaining a clear view of the global impacts of unsafe food is a very complex undertaking. What is clear, however, is that even the latest data are likely to be an underestimate.

## The food safety landscape: then and now

Understanding our progress in the management of foodborne disease depends on having the prerequisite baseline surveillance data. Few countries routinely collect such data, and such data as are available depend on affected individuals coming forward for treatment and being correctly diagnosed. Even the most advanced medical systems struggle to obtain consistent and comparative data, especially data that permit the identification of trends over past decades. Nevertheless, some devastating outbreaks have been well documented.

### The headlines 20 years ago

One of the deadliest Salmonella outbreaks in American history occurred in 1985 in Chicago, USA, as a direct result of tainted milk produced at Hillfarm Dairy (operated by that city's Jewel Companies Inc.). At least 16,000 cases of *Salmonella enterica serovar Typhimurium* were documented, but the outbreak is estimated to have affected between 150,000 and 250,000 people in total; it caused nine deaths.<sup>6</sup>

In 1985, an outbreak of Listeriosis in Los Angeles County led to the deaths of pregnant women and babies. Contaminated Mexican-style fresh cheeses resulted in the deaths of 28 people, including 10 newborns and 18 adults. There were also 20 miscarriages.<sup>7</sup>

Figure 1 | WHO Estimates of the global burden of foodborne diseases. 2015



Source: WHO Estimates of the Global Burden of Foodborne Diseases. 2015.

In 1988 in the UK, the presence of *Salmonella enterica serovar Enteritidis pt4c* in eggs hit the headlines. This type of Salmonella was a new issue, and due to a change in its pathogenicity, it actually managed to penetrate hens' ovaries, allowing Salmonella to get inside the egg for the first time.<sup>8</sup>



Salmonella.

Source: SDAVID MACK/Science Photo Library/Getty Images

A number of high-profile food safety outbreaks occurred in the 1990s linked to a range of foods, including smoked mussels (1992; New Zealand); “rilletes” or potted pork (1993, France); pasteurized chocolate milk (1994, USA); raw milk soft cheese (1995, France); frankfurters (1998–99, USA); and butter (1998-9, Finland) to name a but few.<sup>9</sup>

In 1993 an outbreak of *E. coli* O157, a new serotype in the USA, caused 700 people to fall sick. Four children died. Hamburgers from the fast-food chain Jack in the Box were thought to be the cause.<sup>10</sup>

A previously unknown variant of Creutzfeldt-Jakob (new version Creutzfeldt-Jakob, nvCJD) rocked the world in 1996.<sup>11</sup> nvCJD was attributed to the consumption of meat contaminated with scrapie, a prion disease of sheep. With it came the discovery that the disease had jumped species and was causing Bovine Spongiform Encephalopathy (BSE), or “mad cow disease,” as it became commonly known. BSE wreaked havoc on agricultural exports, and led to the rapid implementation of new traceability systems and the practice of removing high-risk materials from the food and feed supply chain. Improvements across the industry often result from a devastating failure or event. This is clearly an inefficient, and somewhat tragic, approach to progress.

### The recent past

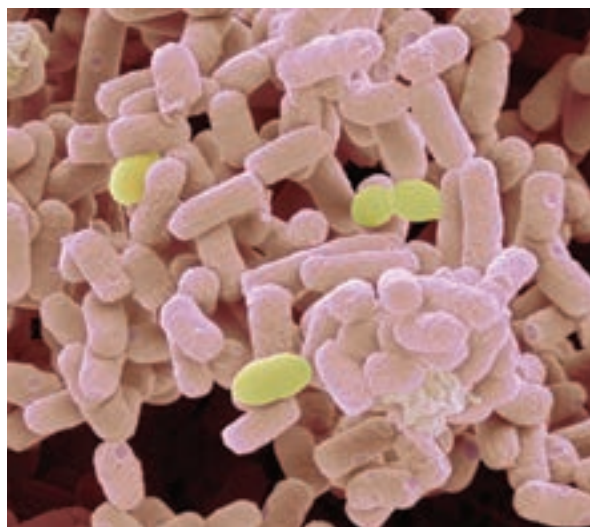
An incident in 2004, originally believed to be due to mycotoxin contamination and affecting an estimated 6,000 dogs in Asia, was later found to be the result of melamine adulteration. It took years to understand exactly what had happened and why, but these incidents highlighted the risk of the tangible impact of an “unknown,” a new hazard, forcing a revision of food safety globally.<sup>12</sup>

In 2007 the chemical melamine was detected in pet food in North America, causing kidney failure in thousands of dogs and cats. The tragic impact of melamine poisoning on humans was revealed in the Chinese milk scandal of 2008, in which milk, infant formula and other food materials were commercially adulterated with melamine. An estimated 300,000 individuals developed kidney stones and suffered kidney damage. Six infants died, and an estimated 54,000 babies were hospitalized.<sup>13</sup>

In 2014 the use of gutter oil in food was linked to pastries sold in Hong Kong in stores including Maxim’s Cakes, 7-Eleven and Starbucks. Gutter oil is oil extracted from a variety of waste streams such as food waste, offal from slaughterhouses and the by-products of leather processing plants.<sup>14</sup>

The months immediately prior to the drafting of this chapter were marred by significant food safety issues. Blue Bell Creamery, a US purveyor of ice cream for over 100 years, experienced *Listeria* contamination in 2015, resulting in 10 reported cases, with three deaths. Despite suspending manufacturing in two facilities for several months, Blue Bell Creamery continued to experience issues in other facilities and was reportedly unable to identify the sources of the contamination.<sup>15</sup>

Again in 2015, Chipotle Mexican Grill – a US fast food business which positioned its offering as natural, transparent and simple recipes – experienced multiple food safety issues, including outbreaks of illness due to Shiga toxin-producing *Escherichia coli* O26 and Norovirus. The crisis led to the closure of over 40 restaurants in the American Northwest for an extended period.<sup>16</sup> Hundreds of people fell ill in California and the Southwest, and an outbreak at a college campus in Boston prompted regulators and the Justice Department to subpoena the company in order to understand its food safety protocols. Following the crisis, Chipotle stated that they intend to become a leader in food safety, closing all their restaurants for a day in order to conduct extended food safety training.



Colored scanning electron micrograph (SEM) of *Escherichia coli* bacteria (pink). A few cocci bacteria (yellow) are also present. Magnification:  $\times 40,000$  when printed at 10 centimeters wide. Source: Science Photo Library – Steve Gschmeissner / Getty Images



*Steering Committee Members from the Partnership for Aflatoxin Control in Africa (PACA) visiting a low-cost drying facility in Kenya.*  
Source: Wezi Chunga, PACA Secretariat



## Dr Junshi Chen

**Chief Adviser, China National Center for Food Safety Risk Assessment (CFSA)**

### Food safety in China

Over the past 30 years, China – as a developing country with a large population and considerable geographical heterogeneity – has experienced rapid progress, eliminating food shortages and rendering hunger a thing of the past. Like many other developing countries, China today experiences the inevitable conflict between traditional, small-scale farms and small food businesses on the one hand and increasingly stringent consumer demands for a safe, high-quality food supply on the other.

Microbial contamination, mycotoxins, heavy metals, pesticide residue, veterinary drug residues and environmental pollutants

in foods are the major food safety concerns in China. In addition, food fraud erodes consumer confidence in the food system and challenges the government's ability to control food safety. Food producers, distributors and retailers, as well as the government, all have a responsibility to meet consumer expectations and ensure that food produced and consumed in China is safe. This can only be done by following the risk analysis framework, with the support of all stakeholders.

Aflatoxin contamination offers a good example of food safety challenges in contemporary China. Because small-scale farming still predominates in the country, aflatoxin contamination in corn, milk, nuts and even certain types of tea continues to be a major food safety issue. Moreover, the effects of climate change have made it more difficult to control aflatoxin contamination in agricultural products. The introduction of improved crop production and handling practices and the deployment of appropriate technologies are the prerequisites for bringing aflatoxin contamination in China under control.

## Globalization of the food supply: a new level of risk?

For the general public, the impression is one of an increasing number of food safety scares, and new threats on top of old. Not only do food safety threats remain today; the list of hazards that food safety practitioners must manage has continued to grow, and has become more complex. New organisms are adapting, causing illness in the food supply chain, and prompting consumers to question the ability of industry and regulators to cope with these issues. Commercial adulteration, evolving consumer attitudes and increasing pressure from a 24-hour social media environment are all compounding the challenges faced by food manufacturers.

The world increasingly depends on a global supply chain to source key raw materials. Global supply chains are not in themselves new: spices have travelled across the world from Asia for centuries; sugar has been a key export from South America; and cocoa has been distributed worldwide from West Africa. What *has* changed is the volume and pace at which ingredients are traded in response to a growing global demand that now must satisfy consumers in all corners of the world.

The Transnationality Index (TNI), which measures the extent to which companies operate outside their home country borders, shows that food manufacturing became more trans-nationalized over the period 1990–1999. One food and beverage company featured in the top 10 non-financial companies ranked by TNI for the final year of that decade.<sup>17,18</sup> By 2013, the food and beverage companies

in the top 10 by TNI had increased from one to three, demonstrating the international scale at which we are operating today and the increased requirements concerning risk management and governance.<sup>19</sup>

The food and beverage industry is one of the most global non-financial business sectors in terms of the number of companies that feature, with eight companies in the top 100 most transnational companies ahead of telecommunications, mining and quarrying, utilities and wholesale trade.

**Table 1 | Number of companies in the top 100 per sector as ranked by TNI in 2013<sup>19</sup>**

Sector	No. of companies in top 100 in 2013
Petroleum	12
Motor vehicles	11
Electrical and electronic equipment	9
Pharmaceuticals	9
Food and beverage	8
Telecommunications	5
Mining and quarrying	5
Utilities (electricity, gas and water)	5
Wholesale trade	5

Source: Based on data from the United Nations Conference on Trade and Development World Investment Report 2014

Figure 2 | The well-traveled salad<sup>20</sup>

In a recent analysis of a simple American salad plate, researchers traced the ingredients' origins and generated a surprising picture:



Source: IOM (Institute of Medicine), UNCTAD World Investment Report 2002.

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Today, many ingredients travel hundreds or even thousands of miles before being consumed. Great concern has been caused by supply from China,<sup>21</sup> although, interestingly, global demand for Chinese raw materials is increasing faster than China's supply to the world.<sup>22</sup>

Food safety incidents are caused by supply from countries with different standards, but while this adds to the complexity of the global food supply, it is not the core issue. Both developed and developing countries experience food safety outbreaks that are domestic in origin, as the CDC data has shown.<sup>5,14,15</sup> The key challenge is that not all food safety management is created equal, and today's global supply chains are being managed to varying levels of food safety capability, often lacking the infrastructure and validation methods necessary to keep pace with the volume

of trade. The food supply chains, globally, are insufficiently robust. The lack of harmonization of food safety management not only makes it difficult for food companies to control risks; it also hinders the development and application of cohesive and standardized global food safety standards and governance – in which business should be a partner. All of this translates into tangible economic costs, which cannot be afforded by most business models, health systems or economies.

Additional burdens on today's already overstretched global food supply systems are food loss and food waste. Not all food produced for human consumption is eaten. FAO estimates that around one third of the food produced in the world every year – approximately 1.3 billion tons – is lost or wasted, with quantitative food losses and waste per year

estimated at around 30% for cereals and 40–50% for root crops.<sup>23, 24</sup> These figures do not include the unsafe food that is being consumed: we are probably significantly overestimating the global food supply because the unsafe food is not extracted from the data. And much bigger challenges lie ahead.

According to the FAO: “Over the next four decades, the world’s population is forecast to increase by 2 billion people and to exceed 9 billion people by 2050. Recent FAO estimates indicate that to meet the projected demand, global agricultural production will have to increase by 60 percent from its 2005–2007 levels.”<sup>25</sup>

To meet this demand, we will have to optimize food supply systems in an unprecedented way. In 2011 Scientific American stated that: “The world must solve three food issues simultaneously. End hunger, double food production by 2050, and do both while drastically reducing agriculture’s impact on the environment.”<sup>26</sup> Sustainable food production expert Jason Clay states that: “We have to produce as much food in the next 40 years as we have in the last 8,000... And if we want to do it without expanding further into the environment, we’re going to have to produce twice as much food on the same amount of land.”<sup>27</sup>



*A visit to a PACA-partner lab in Uganda by teams from the African Union (AU) and the New Partnership for Africa's Development (NEPAD), an African Union strategic framework for pan-African socioeconomic development. Food safety is a complex problem, and there is still a long way to go in effectively addressing it on a global scale.*

*Source: Wezi Chunga, PACA Secretariat*

## Counting the cost of unsafe food: a focus on aflatoxin

The impact and challenges of aflatoxin perhaps exemplify better than anything else the interplay of food security and food safety.

Aflatoxins are invisible poisons that contaminate many staple food and cash crops (including maize, tree nuts, cassava, millet, peanuts, wheat and a range of spices) and animal feeds. They are produced by the related fungal species *Aspergillus flavus* and *Aspergillus parasiticus*. Aflatoxin contamination can occur throughout value chains, making it difficult to target interventions. Pre-harvest occurrence of aflatoxin increases when crops are subjected to stress factors such as drought and attacks from pests. Post-harvest contamination spikes with poor drying, storage and handling. Aflatoxin is virtually indestructible, since normal food processing practices do not affect aflatoxin levels to any appreciable extent. The aflatoxin problem is so complex that it straddles three sectors: public health, agriculture, and trade.

### Health and nutrition impact of aflatoxins

Aflatoxins cause liver cancer in humans.<sup>28</sup> Aflatoxin B<sub>1</sub> is the most potent naturally occurring liver carcinogen so far known. There is an up to 30 times greater risk of acquiring liver cancer from chronic infection with Hepatitis B virus and dietary exposure to aflatoxin as compared to exposure to either of the two factors alone.<sup>29</sup> The number of liver cancer cases continues to increase year by year, with 748,000 new cases and 695,900 deaths from the tumor occurring in 2008, making it third in the world and first in Africa in terms of annual cancer mortality rates. Aflatoxin may play a causative role in 5–28.2% of all global liver cancer cases.<sup>30</sup> Both aflatoxin exposure and chronic Hepatitis B infection predominate in rural Africa, which explains why the highest incidence of liver cancer (40%) occurs in Africa.

In addition, mounting evidence indicates that ingestion of aflatoxin-contaminated food is associated with stunting in children, as well as maternal anemia and mortality. A recent report concluded that the consistency of human epidemiological studies and the mechanistic data in animal models suggest that mycotoxin (the general name for toxins from fungi) exposure contributes to stunting.<sup>28</sup> Aflatoxin exposure is also linked to immune system suppression and increased susceptibility to infectious diseases such as malaria and HIV-AIDS.

Exposure to high levels of aflatoxins is fatal. This is tragically evidenced in outbreaks of acute aflatoxin

poisoning, such as the outbreak in Kenya in 2004 that killed 125 people due to consumption of maize contaminated with aflatoxins.<sup>31</sup>

Aflatoxins also affect the volume and value of agricultural output, and can directly impact food and nutrition security. For instance, about 10% of the 2010 Kenyan maize harvest was withdrawn from the food supply in a responsible move taken by the Kenyan government to protect public health.



Sample preparation at the mycotoxin platform of Beca-ILRI, Kenya.  
Source: Wezi Chunga, PACA Secretariat

### Economic impact of aflatoxins

Due to the serious health effects of aflatoxins, legislation around the world limits their presence in food and feed, which adversely affects market access for many developing countries. Related to this, the geographical scope for sourcing a reliable supply of safe, quality raw materials such as groundnut has shrunk in the past four decades because of aflatoxin contamination. Africa could earn up to US\$1 billion per year from groundnut exports by regaining the 77% share of the global groundnut export market it enjoyed in the 1960s instead of the current share of 4%, which is valued at just US\$64 million. Despite the general decline in the demand for groundnuts for crushing to oil, the demand for edible groundnuts has been steadily increasing globally. The groundnut industry in Africa has been thrown into disarray – partly due to the difficulty of meeting aflatoxin standards and the consequent loss of attractive export markets, and partly due to unfavorable public policies.

The lack of consistency in aflatoxin standards among countries hampers export. Countries are likely to trade with each other if they have similar sanitary and phytosanitary standards (SPS). Moreover, developing countries with weak SPS capacities find it difficult to meet the diverse standards of importing countries. Investment by developing countries in strengthening SPS capacities, and in particular, food safety capacities, needs to be commensurate with the cost of weak capacities in these areas. The costs are: exclusion from export markets with associated lost opportunity for economic development and unacceptably high dietary exposure of local consumers to mycotoxins. Preliminary studies commissioned by the Partnership for Aflatoxin Control in Africa (PACA) reported Disability Adjusted Life Years (DALYs) ranging from 93,639 in the Gambia to 546,000 in Tanzania, with US\$94 million to be saved in the Gambia alone if efforts were to be made to reduce aflatoxin exposure.



Women shelling groundnuts in Senegal, a PACA partner country. The women and their children are fully exposed to the dust emanating from the groundnut shells, which is laden with fungal spores containing aflatoxins. A bowl and a bag are being used as protective head-coverings.

Source: Winta Sintayehu, PACA Secretariat

### Why is aflatoxin a threat to smallholder farmers of Africa?

Aflatoxins are a worldwide problem because of the global movement of affected produce. However, the challenge is more serious in Africa, and the burden on smallholder farmers far more pressing, for a number of reasons (Figure 4). First, prevalence of the toxin is higher in Africa and South East Asia. Second, subsistence farmers cannot afford to diversify their diet and are often heavily dependent on high-aflatoxin-risk staple crops such as maize and groundnuts. They consume 70% of what they produce, selling the better-quality produce to generate income. Third, weak policy and organizational support, coupled with limited awareness of the importance of aflatoxin control to public health, aggravate the problem – more so in the case of smallholder farmers.

Figure 3 | Factors contributing to the serious aflatoxin problem in Africa



Source: Amare Ayalew

### Aflatoxin mitigation

Systemic thinking is called for in order to manage the complex problem of aflatoxin contamination. Possible solutions require multidisciplinary and multistakeholder actions. Effective aflatoxin control relies on: integrating measures aimed at reducing aflatoxin contamination (pre- and post-harvest technology solutions which are suitable for adoption by small-scale farmers and which have the highest potential for impact); minimizing the risk of human or animal exposure in the event that contamination does occur (regulatory solutions); and creating a policy and institutional environment which enables technology solutions and regulation to be effective in abating the aflatoxin problem. Moreover, developing countries should proactively invest in making their agricultural sectors more competitive. Increased productivity and responding to market requirements enables farmers to afford aflatoxin control technologies while improving their food and nutrition security and their market income.

The Partnership for Aflatoxin Control in Africa (PACA) and governments of six pilot countries on the continent

(Gambia, Malawi, Nigeria, Senegal, Tanzania and Uganda) generated empirical evidence on the nature and impact of aflatoxin contamination, and developed comprehensive yet feasible Aflatoxin Control National Plans. These plans take the multisectoral approach and aim at empowering consumers and protecting them from the devastating effects of aflatoxins both within Africa and beyond, resulting in economic gains, increased smallholder incomes, enhanced agribusiness, and reduced poverty. The Partnership for Aflatoxin Control in Africa has launched a unique one-stop portal known as Africa Aflatoxin Information Management System to provide comprehensive information ranging from aflatoxin levels in key crops in different countries to testing methods and data on trade volumes, losses and rejections, and aflatoxin-related health impacts. This unique resource will support policy and interventions toward more effective aflatoxin control in agriculture and food systems in Africa. Testing and scaling of pre-harvest (biocontrol) and post-harvest (storage and drying) technologies are being conducted by PACA partners in Africa. Like most food safety burdens, aflatoxin contamination is preventable and manageable.

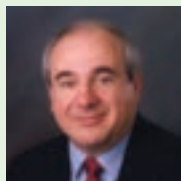
### The critical role of food safety in ensuring global food security

The food safety landscape is more challenging than it was 20 years ago. At the same time, there has been arguably very little progress over the past 20 to 30 years in terms of our ability to ensure safe food. Today, the environments within which food suppliers, producers and manufacturers operate continue to evolve at an ever-increasing rate, with new hazards and pathogens regularly emerging, exacerbated by the globalization of the food supply chain. The added pressures of climate change and population growth compound the problem.

While great strides have been made in data collection – of which the WHO Estimates of Foodborne Diseases report is an excellent example – the lens through which food safety is viewed needs to change. The health and economic impacts of unsafe food continue to cause devastation, especially for those who are already most vulnerable. Aflatoxins are a notable example, with disastrous consequences both medically and economically. However, although the devastating impacts are widely acknowledged, the crops affected are not currently counted as part of food waste

estimates, leading to a potentially skewed view. We know that some 30–50% of all food produced is either lost or wasted, as described in chapter 3.4 of this book. At the same time FAO estimates that 4.5 billion people are exposed to aflatoxins annually, many of them having consumed “food” considered unfit for onward distribution. The way we look at unsafe food, and at food waste, must change.

It is clear that we cannot achieve food security unless we tackle food safety on a global scale. The question is, are we doing enough to mitigate threats to the food supply in light of the challenges we face? The answer is no. If we are to tackle these global threats head-on, our approach to food safety management must adapt to the changing environment. We must become better connected, collaborate, and openly share food safety knowledge and expertise. Only through collaboration among all stakeholders will we ensure that the right food safety knowledge, risk management methods and interventions are successfully applied across the global food supply chain.



## J B Cordaro

**Global Food Security, Nutrition and Safety Consultant, Mars, Incorporated, McLean, VA, USA**

### How Business Partnerships Can Help Achieve Food Security

#### The value of business partnerships

Growing awareness of the significant human, economic and social impacts of global food safety problems has led decision-makers to think in new ways in order to increase the likelihood of food security. At the center of this thinking is the recognition that:

- 1 no single entity can raise the bar to ensure safe food at all times for all people;
- 2 the private sector possesses tools, capabilities and expertise that can effectively be deployed to foster food safety;
- 3 food safety is a pre-competitive matter; and
- 4 multisector, multidisciplinary partnerships and collaborations are required to manage food safety challenges.

The private sector is participating in food safety collaborations, working in close partnership with governments and other stakeholders. These uncommon partnerships have become necessary as public resources for addressing food safety have dwindled.

Events of recent years have demonstrated the need for, and the value of, expanded and inclusive private-sector participation in this area. Three contemporary entities are especially notable for their trailblazing commitment to engage the private sector in pursuit of higher food safety standards. They are: (1) the Global Alliance for Improved Nutrition (GAIN), established in 2002; (2) the UN Committee on World Food Security (CFS), established by the World Food Conference in 1974 and reformed in 2009 to ensure that the voices of many stakeholders, including the private sector, should be heard in policy formulation; and (3) the African Union Commission's Partnership for Aflatoxin Control in Africa (AUC PACA), established in 2012 to eliminate the harmful impacts of aflatoxins.

GAIN, the UN CFS and PACA emphasize the strategic role that the private sector plays in fulfilling their missions.

- With GAIN, the private sector includes local and multinational food companies, especially those producing

fortified foods for micronutrient-deficient populations. These companies support country food fortification programs by sharing their technical expertise, including their expertise on food safety and quality.

- With the UN CFS, the Committee's Private Sector Mechanism (PSM) provides the platform for interested businesses to help shape the outcomes of the food security, nutrition and safety discussions and to help formulate recommendations for consideration by member states.
- With PACA, the private sector, international organizations, foundations and other stakeholders seek to deploy resources to manage aflatoxins from farm to fork.

In addition to the leading role exercised by the UN CFS, other parts of the UN System, such as FAO, have increased calls for collaboration with the private sector during the past decade. Under the leadership of UN Secretary General Ban Ki-moon, major events in 2014 and 2015 defined frameworks for global food security, nutrition and safety agendas. These frameworks have specific targets and activities to fulfil the hypothesis that hunger and malnutrition can be ended by 2030. In each of the Secretary General's interrelated, global milestone events, essential roles for the private sector were emphasized:

- 1 the International Conference on Nutrition (ICN2), with strong participation from business, approved the Rome Declaration – a political statement of the problems and Framework for Action and a technical guide for policy implementation that underscores the essential role of the private sector;
- 2 the Third Financing for Development Meeting (FfD3) detailed innovative ways to assemble financial, policy, governance and leadership resources for implementation, and called for extensive roles for business and partnerships in mobilizing human and financial resources, expertise, technology and knowledge;
- 3 the Sustainable Development Goals (SDGs) build on the Millennium Development Goals (MDGs) to transform economic, human and social development by means of 17 goals and 169 targets across food systems, through directives to multistakeholder partnerships;
- 4 the Climate Change Conference (COP21) forged agreements among countries and obtained commitments from the private sector to stabilize global warming, including actions to address the negative impacts of global warming on agriculture and food production and to partner in finding solutions;

- 5 the FAO Strategy for Partnerships with the Private Sector recognizes that the fight against hunger – to meet the Zero Hunger Challenge – can only be won if the private sector utilizes its knowledge, data and scientific innovation capabilities to increase sustainable food production, eliminate waste and provide the most vulnerable people with access to food; and
- 6 the profile of Partnerships, as one of the 5Ps of Agenda 2030, places multistakeholder Partnerships alongside People, Planet, Prosperity and Peace.

The September 2015 UN Private Sector Forum, led by Secretary-General Ban Ki-moon and with a commentary from Bono, illustrated the shift in thinking that has taken place. Bono said: “I’m late to realizing that it’s you guys, it’s the private sector, it’s commerce that’s going to take the majority of people out of extreme poverty.” He added: “As an activist, I almost found that hard to say.”

#### Linkages among food security, nutrition and safety

Sustainable and resilient global food security systems must be developed to provide consumers regular access to diverse diets with adequate amounts of nutritious foods that are safe and affordable. Each of these components is essential, and no single one is sufficient to overcome food insecurity; however, safety drives the ultimate availability and nutritional values such that without safe food, nutrition insecurity will persist for consumers, especially in Africa. The vision of ending hunger and malnutrition by 2030 will remain unfulfilled unless the challenges of unsafe food are brought under control and solutions are implemented to manage their harmful impacts.

For too long, food safety was viewed as an afterthought to production and nutrition, but now linkages among safety, availability and nutrition are widely recognized, and are generating increasing attention. At the same time, the many safety challenges in food systems – from production to consumption – have been claiming more and more attention, as the present book’s chapter on Food Safety by Crean and Ayalew demonstrates.

#### An example of collaboration: Mars, Incorporated and the Partnership for Aflatoxin Control in Africa (PACA)

Business can responsibly deploy, and strategically leverage, its storehouses of tools, capabilities, knowledge, insights, research, technologies, management tools and expertise for safer, better quality foods. For example, Mars, Incorporated has stepped forward to collaborate in multisector and

multidisciplinary ways. Mars cooperates with the UN Committee on World Food Security (UN CFS) to increase awareness of food safety challenges by sponsoring food safety side events. In addition, the Mars Global Food Safety Center (GFSC) was established as the world’s first center of excellence to address food safety problems on a pre-competitive basis. The GFSC benefits over 60 other Mars partnerships with UN agencies, universities, and international organizations such as the World Food Programme (WFP); the Food and Agriculture Organization (FAO); the GAIN Business Platform for Nutrition Research (BPNR); and a unique focus on aflatoxins with the Partnership for Aflatoxin Control in Africa (PACA).

Mars and PACA agreed to share food safety resources and expertise to control aflatoxins – the most serious food safety problem in African food crops. To date, the partnership has:

- 1 facilitated the sharing of research, knowledge, and best practices, and will enhance capability for aflatoxin testing and controls;
- 2 raised awareness among global policy-makers of aflatoxin issues; and
- 3 identified opportunities to pilot and implement practical efforts to harmonize food safety management in Africa.

On the signing of the PACA-Mars agreement, H.E. Rhoda Peace Tumusiime, Commissioner for Rural Economy and Agriculture of the African Union Commission, stressed: “The cooperation between the African Union Commission and Mars is in line with our efforts to tackle the complex aflatoxin challenge by working together with a wide array of stakeholders. We value the competencies of the private sector, and particularly the experience of Mars in food safety and quality and the creation of preemptive food safety research platforms, all of which are of direct relevance to aflatoxin control... This Memorandum of Understanding should serve as a launching pad for collaborations to improve food quality and safety standards that eventually benefit millions of small-scale farmers in Africa, who depend on crops such as maize and groundnuts for their income and food.”

The value of global food systems will not be defined simply by whether more food is produced, but rather by whether critical food safety deficiencies are more effectively managed from farm to fork so as to provide vulnerable populations sustainable, regular access to nutritious, affordable, safe and wholesome food products. Improving the safety of foods helps ensure that food systems sustain food security, and that better nutrition is available to those who need it, now and in the future.

## Our personal view

### Dave Crean & Amare Ayalew

Economically developed and developing countries may be vastly different, but they broadly share the same food supply system, and perhaps nothing illustrates this better than the challenges of ensuring the safety of the world's food supply. The classic approaches to food safety whereby stakeholders operate in isolation must be changed: they are not sufficient, and will only become worse in the face of increasing population growth, economic pressure and global warming.

We must establish transparent and rigorous systems and enhance the relationships among farmers, processors,

distributors and retailers in all countries. Food safety data today are viewed as a decision-making tool by businesses, but we are missing their true value: they are a public health asset. How can regulators organize and equip themselves to create a system that allows for use of that data, and how can business mobilize to provide that data? Rigorous data and surveillance can become the platform to drive interventions, the interventions that will fix and protect the food supply.

Food safety challenges cannot be addressed by a single entity or discipline. Thus multidisciplinary and multisector partnerships and collaborations are required on a continuous, permanent basis. Without safe food, the world will not achieve global food security and improved nutrition. After all, if it's not safe, it's not food.

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## Further reading

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