Food Safety or Food Availability: Do We Have to Choose?

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SUMMARY

Food safety and food availability are independent entities that can seem to be in opposition. Do we have to choose between them? Or are there ways to integrate them to provide safe, abundant, nutritious food? A safe and available food supply is considered a basic right of all individuals. Although the two goals of food safety and food availability must be met to protect and improve human health, food safety measures are likely to increase food costs and may decrease production of some foods. The International Association for Food Protection (IAFP) 2014 Annual Meeting featured a roundtable session on issues related to food safety and availability. This article summarizes the discussion and further elucidates current issues and future directions for meeting the challenges. Four questions are addressed: (1) What issues are at the core of the food safety/food availability debate? (2) What is currently being done with regard to food safety and food availability issues? (3) What more can be done to work toward both goals? (4) What are potential roles of IAFP members in addressing the issues?

OVERVIEW

Food safety assesses and encompasses all points of the food production system at which foodborne illness risks can be controlled or minimized. Food availability (food security) refers to reliable access to a sufficient amount of food that is safe, wholesome, and nutritious. Both need to be met to protect and improve human health and nutrition. Access to safe and nutritious food is considered a basic individual right *(12)*.

Increasing access to healthy food has become a key focus of efforts to reduce chronic diseases and health disparities and to end hunger and food insecurity. The efforts have largely focused on improving the availability and affordability of whole grains, fruits, vegetables, and lean protein sources. Food security issues also encompass economics, government policies, trade barriers, and cultural issues that go far beyond the food supply alone. Along with these efforts is increased interest and concern surrounding food safety. The World Health Organization (WHO) stresses that food safety must accompany food and nutrition security *(9)*, and the 2015 World Health Day focused on "food safety from farm to plate."

Food safety measures, mandated by buyers and/or regulatory action to reduce the risks of foodborne illness, are likely to increase food costs and may decrease the production of some crops and foods, challenging the systems that provide plentiful and affordable food. Societal objectives of preventing risks to consumers' lives and health, which is anchored in various food safety regulations, may conflict with the ambition to avoid food waste. Food safety and food availability are independent entities that can seem to be in opposition. Do we have to choose between them, or are there ways to integrate them to provide safe, abundant, nutritious food?

The IAFP 2014 Annual Meeting featured a roundtable session aimed at discussing the issues related to food safety and availability. The purpose of this article is to summarize the session discussion, with further elucidation of the current issues and consideration of future directions for meeting the challenges posed by the need to ensure both food safety and food availability.

This article will focus on four main questions:

1. What issues are at the core of the food safety/food availability debate?
2. What is currently being done with regard to food safety and food availability issues?
3. What more can be done to work toward both goals?
4. What are potential roles of IAFP members in addressing the issues?

What issues are at the core of the food safety/food availability debate?

The Centers for Disease Control has estimated that 48 million cases of foodborne illness, affecting nearly 1 in 6 Americans, occur each year in the United States *(25, 26)*. Hospitalizations as a result of food contaminations approach 128,000 annually, and an estimated 3,000 deaths occur. Although these are United States statistics, foodborne illnesses are a challenge globally as well. This public health burden, in addition to increasing consumer demand for healthy, safe food and better food labeling, drive efforts to reduce the risk of illness. The U.S. Department of Agriculture (USDA) has issued compliance guidelines toward controlling *Salmonella* and *Campylobacter* in poultry and pathogenic *E. coli* in cattle. The 2011 Food Safety Modernization Act provided the U.S. Food & Drug Administration (FDA) with enhanced authority to regulate foods, including fresh produce. The FDA Model Food Code and international regulatory developments are also important components in the reshaping of the food system. These regulatory actions, aimed at reducing foodborne illnesses, require hazard prevention measures, often at increased cost to the food industry.

The number, proximity, and types of places to obtain food that people have in their community as well as the amount, affordability and variety of foods, are all part of the complex "food availability" issue. The four pillars needed in a food system to ensure that people have adequate nutrition are availability, access, utilization and stability *(16)*. The system is influenced by the food infrastructure, which includes the underlying policy, physical, resource, organizational and regulatory structures needed for a safe, healthy, sustainable food system. Increasing priorities for healthy eating, chronic disease prevention, reduction of health care costs, access to nutritious and wholesome food, health equity, hunger relief, access to indigenous foods, support of the local food movement, reduced child labor and other related scientific and social factors are reshaping the food system, locally and globally *(3, 5, 19, 21, 23)*.

The U.S. has an ample food supply, and food expenditures account on average for only 6.7 percent of household income, among the lowest in the world *(28)*. Those who have virtually unlimited food purchasing power and have access to vast quantities and varieties of food have the ability to be highly selective about food choices. Indeed the major chronic food-related public health problem is "overnutrition." The abundance of food results in a pervasive attitude of, "When in doubt, throw it out!" Food is wasted in every part of the food chain, and not only with respect to food safety concerns. In the U.S., food losses totaled nearly 30 percent of the retail and consumer food supply, representing a value of approximately $160 billion *(6)*. While most U.S. households have access to sufficient food to support active lives, about 14 percent experience food insecurity at some time during the year *(11)*. Globally, nearly 500 million people are food insecure, with most in sub-Saharan Africa, followed by Asia, Latin America, and the Caribbean *(29)*.

Reducing post-harvest losses and food waste is essential to combating world hunger as well as to improving food safety. Nearly one-third of all food produced for human consumption is wasted—1.3 billion tons per year *(14)*. Food is wasted throughout the supply chain, from farm to fork, leading to less food being available for consumption. Losses may result from harvesting, packing, processing, storage and distribution operations, from poor infrastructure (e.g., poor refrigerated cold chain), from trade barriers and regulatory action (e.g., perishable product being detained at a border), from market and price mechanisms, and from foods being left to spoil or for other reasons being discarded by retailers and consumers. Recovering just half of what is lost or wasted alone could feed the world *(14)*. Fresh produce, the most perishable food item, accounts for the highest share of losses and is typically among the most frequently wasted items. This food segment alone offers many opportunities to reduce waste through innovations such as packaging solutions for developing countries.

The world is producing more than enough food for its population of over 7.1 billion *(17)*. In fact, the Food and Agriculture Organization of the United Nations (FAO) estimates that more than 2,700 Calories per person per day are produced *(13)*. In contrast, the average daily energy requirement (ADER) is 2,353 Calories *(17)*. However, feeding the world is not just a matter of calories; food is often not where it needs to be. The FAO estimates the global average dietary energy supply (DES) adequacy to be 122 percent and the prevalence of undernourishment (POU) is less than 5 percent in developed countries *(17)*. In contrast, in countries such as Zambia in sub-Saharan Africa, where the average DES is inadequate (98 percent), the POU is nearly 50 percent. Thus, adequate supplies of food tend to be available globally, but when the supplies are unavailable or even slightly inadequate in specific areas of the world, significant undernourishment can result in those areas.

According to the FAO, small farmers produce over 70 percent of the world's food needs; therefore, "coping with the spreading global crisis [environmental and food security] requires focusing on small-scale food producers as a driving force towards socially fair and ecologically sustainable agriculture systems. Over the millennia, small-scale producers have evolved to more resilient and climate-adapted forms of agriculture which are essential to biodiversity and natural resources conservation, as well as to meeting the poverty and hunger challenge" *(15)*. Small farms with short supply chains provide crucial fresh food to their communities and a large proportion of the world's food. Providing accessible and scale-appropriate training embedded in production and post-harvest practices, as well as post-harvest and sanitation infrastructure support, is the key way to supporting the farms' production of safe

food, especially in emerging economies. Practical trainings and infrastructure support for small-scale and poor farmers are essential, because they need to know why and how to implement certain practices, as well as how to improve the infrastructure, when resources are lacking.

Food availability objectives often clash with food safety objectives, creating the need for creative problem-solving, but there are challenges and barriers to arriving at solutions because of the complexity and interconnectedness of food system elements. Government needs to understand how food businesses operate and recognize that business models need to be economically feasible and sustainable, just as businesses need to understand the importance of public health and safety. Regulators often struggle to provide definitive answers when existing regulatory paradigms do not accommodate innovative businesses that offer solutions to food availability challenges, although they are committed to crafting regulations that are both protective and practical, i.e., that provide an appropriate level of public health protection without being unduly burdensome to businesses. Consumers need to understand that for some foods, namely fresh fruits and vegetables, there will always be some food safety risks, and they need to understand those risks when selecting foods they feed their families, as well as how their family demographics impact risks (e.g., small children, the elderly, pregnant women).

What is currently being done with regard to food safety and food availability issues?

There are many organizations working on both aspects of this debate. The demand for food safety, whether regulatory or market driven, will change how the food system—from farms to packinghouses to processing plants—identify, implement and prioritize food safety measures. These groups are mostly those involved in production, packing, and sale of fresh produce, but it is important to consider consumer groups as well, since they have actively advocated for regulatory requirements. The balance of availability vs. food safety often gets lost in consumer messages, especially if the assumption is made that commodities (for example, fresh fruits and vegetables) can be risk-free and that the cost of producing and purchasing them should be excluded from discussions of food safety.

The FDA Food Safety Modernization Act (FSMA), the most sweeping reform of U.S. food safety laws in more than 70 years, aims to ensure that the U.S. food supply is safe by shifting the focus to prevention. The agency's goal is to craft regulations that are protective and practical in that they provide an appropriate level of public health protection without being unduly burdensome. This is key to the FDA's public health mission of ensuring access to safe and nutritious foods. While all consumers expect their food to be safe, most also want it to be inexpensive. As many firms focus on meeting FSMA requirements by tightening their supply chains, providing more direct oversight, and increasing and implementing new quality and safety assurance methods—all of which increase costs—there can be a disproportionate impact of food safety on low income families. Whether in developing or developed countries, the increased cost of ensuring safe food can result in more people being unable to afford a sufficient supply of food.

As expressed in the considerations for setting criteria for *Salmonella* in raw poultry *(20)*, there is particular concern about the interpretation of set criteria that imply a zero tolerance and suggest a complete absence of the pathogen, especially because there is no practical method of proving absence. Microbiological testing may help to verify good practices along the farm to table supply chain, but it is inappropriate to guarantee the absence of pathogens. In addition, there is no effective means of eliminating pathogens from certain commodities, such as fresh or minimally processed produce. While it is not realistic to expect zero contamination, if appropriate levels of protection are in place, some food contamination must be acceptable if food is to be both available and affordable, since some risks cannot be removed from foods without discarding the food altogether *(1, 4, 10)*. There should be a public health goal that encompasses all of the health risks and benefits of consuming a particular food. It is important to understand what public health goal is acceptable for food safety while also understanding the expectations regarding food price, nutritional quality, and availability. Since research shows that consuming produce has many health benefits, it is critical that produce be affordable and available, even if there are some food safety risks *(1, 4)*. The crux of the problem is that the U.S. public is very intolerant of any food safety risk *(2)* relative to risks that they take every day (e.g., driving a car, food choices).

Currently, there is very little coordination in the communication about health and safety across the food system, resulting in disjointed and possibly ineffective messaging that could be hurting the overall education process. It would be beneficial to the advancement of this topic area to engage non-governmental or consumer organizations such as Safe Tables Our Priority, Center for Science in the Public Interest, and Center for Foodborne Illness Research & Prevention, Partnership for Food Safety Education, or other initiatives such as the European Union (EU) project Veg-i-Trade, to see if there is common understanding that exists or can be achieved. Programs such as these have invested time and money in creating consumer safety programs to reduce risks at the consumer level. The Farm to School, Farm to Childcare movement is calling on local farmers to provide fresh produce to children to increase healthy eating behavior and food skills, which heightens the need for food safety practices and education for farmers, processors and institutions *(19, 23)*. State and local governments have resources and experience in engaging

partners in food safety education. Finally, collaborations with grower groups and extension personnel would optimize the use of resources and make the message more cohesive, reaching all sectors of the food system from farm to table.

On a global level, each nation has its own food safety and trade criteria that impact expectations and requirements beyond its borders. For example, in the U.S., FSMA includes the Foreign Supplier Verification Rule, which changes rules for importers. In addition, how the World Trade Organization (WTO) views trade agreements and disagreements influences trade and food safety standards. Furthermore, buyer demand "knows no borders," resulting in opportunities for businesses to ensure safety. Groups such as Global Food Safety Initiative, GLOBAL G.A.P. and other third-party audit companies have been able to convince buyers and importers that their benchmarking and audit schemes are a way of guaranteeing a safe product as it travels across borders. Again, this is based on the assumption that a zero-risk scenario is possible, when it is not. It is also clouded by the fact that a significant amount of money and power is involved in controlling who sells and who is willing to buy products. From a survey on perception of food standards with over 100 participants from around the world, it was noted that food safety and quality standards are seen in their dual role both as a catalyst for implementation of structured food safety management systems on the one hand and as a non-tariff barrier to trade on the other hand *(30)*. In this way, voluntary practices are no longer voluntary, because the marketplace requires them just as regulations are required.

Individuals and organizations are beginning to broaden the discussion about the food system, which is leading to collaboration to determine the appropriate level of protection for a healthy, equitable, and sustainable food supply. This work requires interdisciplinary and multilevel efforts to be effective and viable. For example, food availability is becoming central to community and regional planning. Planning has always played a central role in shaping the environment in which we live to reflect public interests, often catalyzing interactions among various disciplines. According to the American Planning Association (APA), a healthy, sustainable food system "emphasizes, strengthens, and makes visible the interdependent and inseparable relationships between individual sectors (from production to waste disposal) and characteristics (health-promoting, sustainable, resilient, diverse, fair, economically balanced, and transparent) of the system" *(18)*.

As sectors outside of food safety and nutrition, such as planning, are becoming more involved in food availability and food access, public demand for healthier food is also growing. The top national culinary trends are for locally-grown produce, healthful kids' meals, and environmentally sustainable menu items *(24)*. Healthy food availability is being addressed from all angles: from chefs, to retired U.S. admirals and generals who have organized to improve the diet and fitness of youth so they are better able to serve in the armed forces *(22)*, to immigrant farmers forming cooperatives to supply communities with fresh vegetables.

Food charters and food policies, which address the food system's impact on people and the environment and other critical issues, are being developed at the national, state, and community levels. Through civic engagement initiatives, diverse stakeholders identify problems and create a plan to improve the food system. Several U.S. states have food charters, and nations such as Mexico and Brazil have national food policies. The civic engagement process allows for food safety and food availability, along with the other important aspects of the food system, to be part of the dialog, as well as allowing those representing various sectors and disciplines to have a voice in food system-related policymaking. Once in place, entities such as food policy councils are formed to implement the plan *(5, 7, 21)*.

The regulatory infrastructure is changing in response to the increasing need to approach food protection within the complexity of the entire food system. As Michael R. Taylor, FDA deputy commissioner for foods, stated in his address at the 2015 Food and Drug Law Institute Annual Conference, "FSMA's mandate to apply a common set of prevention principles across the entire food production system confronts us with the reality of the food system's enormous scale and diversity." The deputy commissioner also made the assertion, "It [FSMA] sees food safety as more than a regulatory matter and more than a task for FDA as a federal regulatory agency. It sees and embraces food safety as the food system challenge it is—a challenge that must engage the efforts of actors all across the food system." This perspective allows for a balanced approach to achieving food safety and food availability. In his address, the deputy commissioner discussed the vision for FSMA *(27)*:

- Building a national integrated food safety system with our state, local, territorial and tribal regulatory partners
- Increasing engagement with foreign governments in ensuring the safety of the food supply
- Investing the primary responsibility for preventing food safety problems in those who commercially produce, process and market food for consumers, from local food systems to large scale distribution, small specialty retailers to global food companies
- Meeting the diverse needs of those who supply food with respect to their production practices, economic circumstances, and food safety sophistication and capacity
- Ensuring consumers are part of the food safety prevention system
- Making food safety education a more prominent part of our food safety system

The need to work collaboratively to address the underlying factors in the food system that result in poor health outcomes—from disease outbreaks to chronic health

conditions—has created a powerful and pervasive challenge. In response, the role of food safety, nutrition, and other areas is evolving to a systems-based, holistic approach to public health. Simultaneously, standards for food safety and nutrition are rising. The Health Impact Assessment (HIA) is one emerging planning tool that could provide a framework for a multilevel analysis of factors. HIAs are used to evaluate the potential health effects of a plan, project, policy, law, or regulation prior to implementation *(8)*. HIAs are designed to give public health, both environmental and chronic disease prevention, a higher priority in decision-making. However, the HIAs have limited application in the area of food safety in conjunction with food availability, and few tools are available to assess and determine the appropriate level of protection, given inputs from multiple interdisciplinary factors.

What further can be done to work toward both goals?

Cross-disciplinary collaboration and analysis should be done to gain a better understanding of how to balance the need for food safety with the need for food availability. If reaching food safety goals results in rising food prices and declining food availability, any decrease in foodborne illness may be accompanied by increases in food insecurity or other unintended health consequences. In the case of fruits and vegetables, increased consumption results in lower risks for certain types of cancers, cardiovascular disease, and diabetes, as well as improved mental health *(1)*. Thus, efforts to improve public health by reducing foodborne illnesses associated with produce consumption that result in higher produce prices and lower produce availability and consumption may have a net negative impact on public health when all aspects of public health, not just rates of foodborne illnesses associated with fresh produce, are analyzed. To determine real versus perceived consequences, it will take collaboration across disciplines to both conduct research and analyze data, so that we have a true, broad view of public health impacts and can act collectively to implement balanced, integrated food system strategies.

More specifically, here are some things that could be done to further define priorities:

1) Review current research and epidemiological data to determine which parts of the food system are most likely to lead to contamination risks, and prioritize them. This will allow risk reduction practices, such as Good Agricultural Practices (GAPs) at the farm, Good Manufacturing Practices (GMPs) in packinghouses, or Hazard Analysis Critical Control Points (HACCP) in processing plants, to be prioritized based on the magnitude of the public health risk. Regulatory standards can miss the mark in terms of scaling to the appropriate level of protection with respect to the level of risk to the public. Current audit metrics used on farms to meet buyer requirements treat almost all risks as having the same impact, which is not the case. FSMA does have a high-risk foods designation, but it requires everyone to be subject to a significant regulatory requirement regardless of the level of risk. *And* the FDA has designated high-risk foods for which *additional* recordkeeping requirements are necessary in order to rapidly and effectively trace a foodborne illness outbreak. Risk prioritization would aid in optimizing resource utilization and yield the greatest impact on reducing the risk to public health. This has implications on both the production side and the compliance side of the food safety equation and may reduce costs associated with management of food safety, making low-risk foods more available. This idea could be followed throughout the food system, resulting in better use of resources throughout the food system. With this information, audit metrics, protocols for inspection and enforcement, and corrective actions may be adjusted to provide flexibility according to risk level. With good data, outreach messages can be tailored and focused on practices where they have the most impact.
2) Develop and financially support global programs that increase integration, collaboration, civic engagement and cross-disciplinary public health efforts to improve access to safe food. A model for multi-sectorial partnership is the Let's Move Salad Bars to Schools, which was founded by the **Chef Ann Foundation, National Fruit and Vegetable Alliance, United Fresh Produce Association Foundation,** and **Whole Foods Market** in support of First Lady Michelle Obama's **Let's Move!** initiative. By working in states at the local level, funds are raised to purchase salad bars for schools. The program's mission is for every school in the U.S. to have a salad bar so that children have daily access to healthy food. Since 2010, 4,000 salad bars have been provided across the country through grants. Although this program does not focus solely on food safety or availability, it is a great example of a multidisciplinary approach to providing opportunities for the nutrition and food safety sectors to collaborate in improving availability of healthy food for children.
3) Conduct a comprehensive risk/benefit analysis to integrate disease, consumption, availability and outbreak data sets to define quantitative *overall* public health goals. Consuming food has risks and benefits. For example, consuming produce has been shown to reduce the risk of cancer and obesity *(1)*, yet we know that fresh produce can never be zero-risk for pathogen contamination, because there is no kill step. Understanding the impact on human health of the risk of foodborne illness vs. the benefits of consumption would allow setting of public health goals that integrate overall human health parameters including nutrition, safety and chronic illness, as well as malnutrition due to lack of availability.

4) Harmonize global food safety standards such as those developed through the *Codex Alimentarius Commission* to promote free movement of food in international trade. Currently, differing standards between exporting and importing countries result in trade disputes that may threaten food security. Food products that meet specifications for food safety objectives; limits for food additives and pesticide and veterinary drug residues; a food labeling standard; and codes of hygienic practices, should be able to move freely in international food trade.
5) Unify the food safety and nutritious food availability messages across constituent groups, from growers to consumers, to create a cohesive communication outreach plan. Many groups are engaged in creating these messages independently, with little coordination even when addressing the same audience. To unify messages, efforts should be focused on identifying all the outreach audiences and providing a forum for integrating communications on safety, nutrition, and food availability.
6) Ensure that field workers, farmers' market vendors, food service workers, etc., have access to food safety education tools, resources, training, encouragement, and incentives needed on the "front line" of providing healthy safe food to the public. The provision of these resources would indicate a move from reactive to active managerial control of foodborne illness risk factors related to food handling.
7) Conduct food safety and technology research with a stated goal of reducing costs to industry and to the consumer. Develop partnerships to evaluate new technologies that are scale-appropriate, cost-effective and practical, and how they can be implemented. Emphasize research in areas that promote sustainability, efficiency, conservation, and waste reduction.
8) Conduct social science research, including surveys and focus groups, with key stakeholders within the food system to identify common areas where outreach and research can be targeted to build a bridge between food safety and food availability. Initial efforts could focus on growers, processors, retailers, and consumers. Goals could include identifying the top five perceived challenges and the top five perceived benefits to implementing practices that reduce food safety risks but increase availability.
9) Target innovations that reduce, recycle or prevent food waste while keeping food safe and wholesome (e.g., packaging solutions that extend shelf life, bioenergy production, and direct surplus to food banks/community kitchens) but also value and strengthen research on understanding and optimizing conditions for traditional food preservation methods such as fermentation and (solar) drying, in particular in countries where a cold chain cannot be guaranteed at all times.
10) Allocate resources for the initiatives outlined above. Sources may include government, public-private partnerships and non-profit organizations.

WHAT ARE POTENTIAL ROLES OF IAFP MEMBERS IN ADDRESSING THE ISSUES?

Debate about topics related to food safety and food availability is a debate that crosses many boundaries, including economic, trade, and farm viability. It can have social, legal, and political, as well as moral, implications. A continued discussion via symposia, roundtables and white papers will continue to raise awareness and bring needed attention to the topic. However, there are many gaps to fill. IAFP members have the opportunity to turn discussion into action because of their diverse expertise and access to different socio-economic situations, initiating research that considers the relationships between natural science and society, developing practical, scale-appropriate intervention technologies and education/outreach tools, and being outspoken advocates for social change.

Here are three things that could be done in the next two years by IAFP members:

1) Convene symposia and other sessions at IAFP national, international, and local conferences to continue this discussion. These symposia could include food waste as another aspect of the discussion.
2) Form an ad hoc committee to begin assembling key research that could be included in the data analysis in an attempt to quantify risks from consuming produce versus dietary benefits based on consumption of produce.
3) Identify stakeholders to participate in focus groups to discuss and elucidate the challenges and benefits of balancing food safety and food availability.

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