ENSURING SAFE FOOD IN DYNAMIC FOOD SYSTEMS
COULD EXTREME SCENARIOS BECOME A REALITY

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MEDIA STORIES INVOLVING FOOD RECALLS AND FOOD SAFETY ISSUES ARE BECOMING COMMONPLACE, AND ONE MAY WONDER WHETHER THE PUBLIC IS BECOMING DESENSITIZED TO THE POTENTIAL DANGERS OF OUR FOOD SYSTEM. THE REALITY IS AS MANY AS 2.2 MILLION PEOPLE DIE ANNUALLY FROM FOODBORNE AND WATERBORNE DISEASES.\(^1\) IN THE UNITED STATES, IT IS ESTIMATED THAT EACH YEAR ONE IN SIX PEOPLE BECOMES SICK; MORE THAN 127,000 PEOPLE ARE HOSPITALIZED; AND APPROXIMATELY 3,000 PEOPLE DIE OF FOODBORNE ILLNESS. THE ANNUAL ECONOMIC COST OF FOODBORNE ILLNESS IN THE U.S. ALONE IS ESTIMATED AT $77 BILLION.\(^2\) ADDITIONALLY, THE NUMBER AND SEVERITY OF FOOD SAFETY INCIDENTS APPEAR TO BE RISING. TO ILLUSTRATE, THE 2011 LISTERIA OUTBREAK IN THE U.S. (DUE TO CONTAMINATED CANTALOUPES) RESULTED IN 146 CONFIRMED CASES ACROSS 28 STATES, KILLING 30 INDIVIDUALS. THE OUTBREAK WAS DESCRIBED AS “THE WORST FOODBORNE ILLNESS OUTBREAK IN THE UNITED STATES, MEASURED BY THE NUMBER OF DEATHS, SINCE THE CENTERS FOR DISEASE CONTROL AND PREVENTION BEGAN TRACKING OUTBREAKS IN THE 1970’S” \(^3\)

CONCURRENT WITH THE GROWING CHALLENGES IN FOOD SAFETY, OUR FOOD SUPPLY IS BECOMING INCREASINGLY GLOBAL. THE U.S. ALONE IMPORTS ROUGHLY 15% OF ITS FOOD SUPPLY, INCLUDING 80% OF ITS SEAFOOD AND 50% OF ITS PRODUCE. RELIANCE ON IMPORTED FOOD WILL NO DOUBT INCREASE IN FUTURE YEARS, ESPECIALLY AS THE WORLD POPULATION CONTINUES TO GROW AND THE GLOBAL FOOD SUPPLY IS STRAINED. AS WE LOOK TOWARD THE FUTURE, HOW WILL WE ENSURE A SAFE FOOD SUPPLY WHILE THE FOOD SYSTEM CONTINUES TO GROW MORE COMPLEX?

ABOUT THE GLOBAL FOOD PROTECTION INSTITUTE

The Global Food Protection Institute (GFPI), a 501(c)(3) nonprofit organization dedicated to ensuring global food safety, conducted an academic exercise as part of a two-day symposium entitled Ensuring Safe Food in Dynamic Food Systems, convened in May, 2012. The goal of the exercise was to imagine what the food safety system might look like in the year 2025. The symposium was attended by close to one hundred food safety professionals representing local, state, and federal regulators, growers, manufacturers, academia, and local farmers markets.
THE SCENARIO PROCESS
The scenario thinking exercise was based on a process developed by the Global Business Network (FIGURE 1). During this process, participants developed differing scenarios that might unfold in the future given the interaction and evolution of external forces. The activity allowed participants to stretch their thinking about emerging changes, and the opportunities and threats that the future might hold. It is hoped that this scenario planning exercise made the participants better informed, and better able to make short-term and long-term strategic decisions.4

SAFE FOOD SYSTEMS
The focal questions for the exercise were defined as: How do we ensure safe food in the dynamic food systems of the year 2025? What might we need to do? Discussion was then facilitated by a series of focusing questions such as: If consumers are to change their attitude and perception of “X” (e.g., food safety), what changes in industry or sector practice “Y” must occur (e.g., product traceability)?

After this initial discussion, a construct was developed in which the relationship between two critical uncertainties, represented by the x and y axes, would yield four potential outcomes, or Alternative Futures 1 through 4 (FIGURE 2).

CRITICAL UNCERTAINTIES

The initial dialogue led to the identification of multiple uncertainties as the framework for the future scenarios (FIGURE 3). However, for the purpose of the scenario planning exercise, the participants narrowed the uncertainties down to two: food availability and societal acceptance.

With uncertainty due to the possible impact of climate change, energy availability, general macro-economic growth concerns and the shifting regulatory and political reality of the current decade, food could be either abundant or scarce in 2025. Food availability is represented by the x axis, with high and low as axis endpoints.

The second critical uncertainty was determined to be societal acceptance (the y axis), specifically as it pertains to a host of variables, including comfort with and acceptance of the food systems as being capable of delivering safe food; trust in government and industry; confidence in government- and self-imposed regulation; and individual and corporate freedom. High societal acceptance means that the food systems function well and for the benefit of all. Low acceptance reflects a level of dissatisfaction and distrust of the food systems.

FOUR FUTURE SCENARIOS

The scenario planning workshop resulted in four views of the future that were developed as stories under the quadrant titles (FIGURE 4). Utopia’s Table represents the “best case” scenario, and The Hunger Games are Reality a contrasting “worst case” scenario. Creatively Living with Less and Abundance & Angst represent alternate futures that can round out and stretch our thinking when considering how the world might look in the year 2025. Abstracts of the four scenario stories are presented in the text box (FIGURE 5).
2025 SCENARIO #1: UTOPIA’S TABLE
This scenario is characterized by high societal acceptance of the food system and a general trust and confidence in government and the food industry to deliver safe food. At the same time, food is plentiful and readily available as a result of urban farming, increased yields in traditional farming and the implementation of sustainability practices throughout the food supply chain. In 2025, the food system functions as a harmonious hybrid of local, regional and global systems. Food safety technology and policy address this broad scope of the food supply chain with solutions that are completely scalable and work as well for the small farmer as they do for a Fortune 500 food company.

2025 SCENARIO #2: ABUNDANCE & ANGST
This scenario is characterized by a low level of acceptance of the food system and a general mistrust and lack of confidence in the ability of the government and food industry to provide safe food for the nation. At the same time, plenty of food is available due to the increased productivity and sustainability practices that have been put in place over the past decade. Crop yields in the farm fields of today are 100 times those of 50 years ago. The growth of a transportation and logistics system has enabled food from all over the world to be on American tables in a matter of a few days or hours rather than weeks. In addition, the “information age” has bombarded consumers with data intended to inform them, yet people are weary from information overload. Providing a constant stream of information about the food supply has made consumers anxious and unsure about the safety of the abundant food available to them. They have resigned themselves to not fully trusting their food supply but are glad that the pantry is still full.

2025 SCENARIO #3: THE HUNGER GAMES ARE REALITY
This scenario is characterized by a low level of acceptance of the food system and a general mistrust and lack of confidence that the government and food industry can provide safe food for the nation. At the same time, food is extremely scarce and the average American is fighting hunger along with other personal challenges. The backlash against ‘big government’ in 2025, particularly the federal government, has had a negative impact on food safety investment in general. The U.S. socio-economic demographic has shifted rapidly away from “middle class” to an obvious population split of a very large “struggling” class and a small, wealthy “elite” class. Ironically, the U.S. looks a bit like the Great Britain of the 18th century that led to the American Revolution. Is another Boston Tea Party imminent?

2025 SCENARIO #4: CREATIVELY LIVING WITH LESS
Despite the facts that food in any form is relatively scarce around the world, and U.S. access to global food resources is either limited or very expensive, there is general trust in the U.S. and confidence that the government and food industry can deliver safe food. This is because food sector companies and institutions have developed self-sustaining business models to ensure organizational success. Americans have learned to live with less imported food, and have become creative in meeting their nutritional needs. A food alliance has been formed among China, Africa, and South America that rivals what OPEC was to the oil supply from 1970 to 2015, and food demand trumps oil demand. Even though the U.S. is still the leader of the West, it is politically and economically disadvantaged compared with its status during the oil era, and government funding for food safety advances is very limited.
UTOPIA’S TABLE

In Utopia’s Table, food systems function in harmony as a hybrid of thriving local, regional and global systems where food safety needs are met with solutions that work equally well for both small and large companies. By contrast, The Hunger Games are Reality scenario features conflict and tension as socio-economic disparity resonates through to food options – the “elite” class has the best and safest food while the rest are lucky if they have something to eat.

Viewing the world from the year 2025 through the lens of the Utopia’s Table scenario reveals harmony among the various food systems and a general satisfaction that food is available, safe and nutritious. Food companies, ranging from multinationals to local butchers and bakers, are generally self-regulating, invest in systems and technology to ensure food safety, effectively manage risk, and truly aim to provide the best and safest food to customers. Self-regulation has significantly reduced the need for governmental inspection of food facilities, and an interesting workforce shift has occurred. Food safety experts have left government employ to join the food industry and now proactively improve safety on the front line rather than reactively provide inspection services. Job satisfaction among these professionals has increased, along with consumer confidence and trust. The U.S. still retains a small bureaucracy of capable food safety policy writers and inspectors, who provide clarity and context for industry compliance and enforcement when needed. Government regulatory oversight is in good balance with industry self-regulation and consumer choice.

Industry self-regulation is manifested in voluntary certifications of food safety – such as SQF/HACCP, Safe Feed, Safe Food and Food Alliance certifications and USDA organic certification.

THE HUNGER GAMES ARE REALITY

In the contrasting The Hunger Games are Reality scenario, there is considerable conflict and tension surrounding the world food system. The tension between the struggling class and the elites is manifested in the food supply more than in most sectors of the economy. In fact, food production has been flat domestically and globally for a decade now, and prospects for feeding the world’s 8 billion people are dim. These two factors – class struggle and a tight food supply – create a lack of trust and a heightened need for food inspection. However, food inspection is confounded by a lack of government funding and by a populace skeptical of the government. Food companies are burdened by a need to comply with safety regulations yet frustrated that compliance is not leading to better or safer food. Incidents of foodborne illness continue to result in recalls, hospitalizations, and even deaths, and a backlog in resolving these problems contributes to the public distrust.
Fortunately, some of the basic foods that are imported in limited quantity from Chinese-controlled Africa have a high assurance of safety. The autocratic Chinese government, riding the coattails of the U.S. Food Safety Modernization Act, has implemented the law’s requirements — but for its own benefit — and has continued to invest in both food safety technology and food inspector training. The result is that the de facto center of excellence in food safety now resides in Guangzhou, not the U.S. Autocratic government action works in a world where The Hunger Games are Reality, and Western democracies, burdened with ineffective bureaucracies, seem to be failing the food system.

To be sure, the elite class enjoys the best food, first coined as Good Food back in the 2000s — a bounty of fresh produce, grass-fed beef and the best bakery products, cheeses and other dairy products. For example, in Michigan, what was envisioned in the Michigan Good Food Charter — 20% of the state’s food supply in 2020 being healthy, green, fair and affordable — came to be (http://www.michiganfood.org). The problem is that this food is only available to 20% of the population. The other 80% are challenged simply to find enough food of any type or quality, let alone be concerned about food safety. In fact, were it not for a resurgence in fishing, hunting and even the gathering of wild berries and nuts, the diets of many would be limited. The black market for food products has grown, with bartering a regular practice and no questions asked as to origin or safety. It’s very much a buyer-beware world. Foodborne illness outbreaks are the norm, and do cause deaths, but the masses have an attitude of resignation.

The tension between the haves and the have-nots is palpable. A two-track system is well established with high technology, high-cost systems and supporting sophisticated management capabilities that meet high standards targeting the elite markets. A low-capital-input system, with a higher acceptance of contamination potential, exists primarily to serve the needs of the masses.

**IMPLICATIONS**

**WE CONSIDER SOME KEY IMPLICATIONS IN THE TWO SCENARIOS — OUR PREFERRED AND FEARED FUTURE WORLDS OF THE YEAR 2025. THE TABLE ON THE NEXT PAGE LAYS THEM OUT FOR SIDE-BY-SIDE COMPARISON.**
# Ensuring Safe Food in Dynamic Food Systems

<table>
<thead>
<tr>
<th><strong>UTOPIA’S TABLE</strong></th>
<th><strong>THE HUNGER GAMES ARE REALITY</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food Safety, in general</strong></td>
<td>Food safety is a key value in the food system and is as important as food quality, optimal nutritional value, and accessibility of food.</td>
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<tr>
<td><strong>Trust</strong></td>
<td>The concept of “trust, but verify” is the norm in 2025. Verification technology, as well as training, ensures that purveyors can be trusted to engage in best food safety practices.</td>
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<td><strong>Traceability</strong></td>
<td>Technology exists that simplifies the actual tracing and also aids in communicating history. Another reality is the use of “bio-fingerprinting” – tracking not only the source back to the farm, but also through the handler and processor via proprietary “finger-printable” ingredients.</td>
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<td><strong>Sanitation</strong></td>
<td>Best practices are the rule. Better technology for cleaning and verification of food contact surface cleanliness as well as broader environmental control is sought.</td>
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<tr>
<td><strong>Inspection</strong></td>
<td>Advanced technologies for inspection are widely used. However, they play a supporting role behind the use of Best Management Practices (BMP), the primary method of ensuring quality and safety.</td>
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<td><strong>Training</strong></td>
<td>Training for writing, developing, and implementation of BMPs in all sectors of the food industry has resulted in a high level of compliance – and therefore trust. Organizations like The International Food Protection Training Institute and its global partners are recognized global leaders for delivery of training.</td>
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<tr>
<td><strong>Technology</strong></td>
<td>New low-cost rapid-screening technology to test for pathogens is widely used for the following: - Food/crop production and harvesting. - Processing and packaging to ensure safety and stability/preservation. - “On-pack” assurance to consumers that product is safe - at point of purchase and in home storage before consumption.</td>
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<tr>
<td><strong>Documentation/Reporting</strong></td>
<td>Seamless and real-time reporting, trending and corrective action is the norm for all elements of food production, including processes and practices. Because there is so much automation in food production, data is collected in the background and drives the ability to improve food safety.</td>
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<tr>
<td><strong>Hazards/Risks</strong></td>
<td>Risks persist but a suite of food testing technology typically identifies risks quickly. Complimentary ‘quick-tests’ for foodborne illness identification in both people and animals limit the scope of any outbreak.</td>
</tr>
<tr>
<td><strong>Labeling</strong></td>
<td>Informed consumers make wise choices related to nutrition and health. A “do the right thing” attitude prevails among the food industry leading to continuous improvement in food systems and food safety.</td>
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“A DAY IN THE LIFE” OF A FOOD SAFETY PROFESSIONAL

In continuing the scenario exercise, we considered what the job of a food safety professional might look like under these two extreme scenarios. In the Utopia environment, we imagined Sandeep Gupta, a food safety professional working for a consortium of small and medium-sized food producers and processors located in Oregon. The collective has come together to establish a clearinghouse for key support services, including food safety technology and training, that enable the members to be competitive at the local and regional level.

UTOPIA’S TABLE

In the Utopia’s environment Sandeep is fluent in four languages (English, Mandarin, Spanish, and his native Hindi), which is a necessary part of his job’s skill set. While his focus is local and regional, his worldview is global, making sure that the consortium members are on par or better when it comes to utilizing the best technology and best practices. He scours the world for new technology using search tools on the Internet, and he can upload new screening technology and procedures to member food companies instantly – directly through their respective firewall verifier, to their online labs. He is also part of a global food safety clearinghouse where he meets weekly with other food safety professionals working in similar consortiums throughout the world. These meetings are conducted via interactive Vision 3-D holographic avatars in a virtual conference room. They discuss and demonstrate new technology, share alerts on new pathogens, and propose antidotes/solutions.

Sandeep’s position, along with all of his colleagues from around the world, is a key component of the food system, much like the evolution of the IT professional in the latter part of the 20th century.

THE HUNGER GAMES ARE REALITY

For the Hunger Games scenario, we imagined Jane Moore, a food safety professional working as an enforcer for the state government of Florida. She does not focus on all parts of the food system, but rather acts as a “Food Police Officer.” She trolls the black market food halls wearing a flack-jacket and carrying an instrument case that includes a portable laboratory for swabbing and testing food and food production lines – and a “stun gun” for her own protection. Among the people trying to buy and sell food in these markets, she is reviled and is not welcome. She has the power to impose her authority on anyone – consumer, seller, producer, or manufacturer. She has authority to test, search, inspect, seize, and shut down any seller of food. In large part, Jane relies on anonymous “tips”, mostly from individuals who snitch on unsuspecting competitors, sometimes for legitimate violations, sometimes for less than altruistic reasons. Jane, along with other food safety enforcers, is one of the most powerful people in her community. She has the power to determine who stays in business and whether or not people eat. Despite their efforts, Jane and her fellow enforcers are fighting a losing battle. Outbreaks of food borne illnesses are on the rise, and a caveat emptor environment is pervasive.
SHAPING THE FUTURE OF FOOD SAFETY

The contrast between the two scenarios provides a focal point for discussing the future of food safety. Central to ensuring safe food is making it a key value in the food system. Ensuring food safety in the best case scenario is highly valued and ubiquitous throughout the entire food system. On the other hand, in the worst case, safe food is available for some and not for others. It is, in fact, a differentiator.

As we look into the future and consider where we are today with the food system and food safety, we observe that we are currently in a delicate balance between the constant demand for availability/fast delivery, a changing climate, and a growing world population.

CONCLUDING THOUGHTS

We acknowledge that this white paper is an interesting outcome of the visioning exercise, intended to challenge our thinking, yet there are numerous other critical factors that impact the food safety arena, including political systems and economic conditions. We also recognize that the two extreme scenarios, while plausible, are highly improbable barring some significant triggering event. However, such a trigger may be necessary to invigorate a renewed interest and cause us to ask “As we look toward the future, how will we ensure a safe food supply while the food system continues to grow more complex?”

We hope that by presenting these scenarios, we have provoked you to think about food safety policy, practice and innovation as we prepare to feed America in the context of a global population that is projected to reach 8 billion by the 2020s and 9 billion by mid-century. Real choices will need to be made. Will our society develop food systems built on trust and transparency, or on a platform of authoritative directives and rigid enforcement? As food system professionals, how will we help create a preferred future? The scenarios, we trust, provide a framework to help us engage in an ongoing dialog and generate creative solutions – not simply in response to trends, but rather grounded in an awareness of a future that can be very different based on how we act individually and collectively.

Globally we are seeing a new framework of food safety regulations and standards come into existence. The US Food Safety Modernization Act, GFSI, Codex, BRC, and other international standards will all impact the safety of the food supply coming to America. As these laws are implemented, will the industry have the freedom to operate and flexibility to adapt food safety programs to meet the changing market demands and the dynamics of the food system? Or will the regulations constrain how responsive industry can be?