MENUS of CHANGE™

The Business of Healthy, Sustainable, Delicious Food Choices

2013 ANNUAL REPORT

CHARTING THE FUTURE OF FOOD & THE FOODSERVICE INDUSTRY

The Culinary Institute of America®

HARVARD | SCHOOL OF PUBLIC HEALTH

Department of Nutrition

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I. MENUS OF CHANGE: AN OVERVIEW

FOOD MATTERS. THIS IS A LONG-HELD BELIEF AND PASSION OF OURS, AND OF CHEFS AND BUSINESS LEADERS THROUGHOUT AMERICAN FOODSERVICE.

Fifty years ago, most people ate at home and restaurants were largely about special occasions; our industry was much smaller and our challenge was to delight our customers with memorable food and hospitality. Our collective business success has long been tied to reimagining the elemental role that food plays in our lives, including nurturing relationships and building community. In many respects, that is still what drives innovation and growth in our industry, even as chefs, entrepreneurs, and business leaders find themselves operating today on a very different playing field. As the sector has grown to $660 billion in revenues and consumers have increasingly turned to chefs to do the cooking, the impacts of away-from-home food choices have also grown.

The fact of the matter is that chefs now are responsible for everyday meals, not just celebrations. Indulgence is still part of their creative process, but they must now also think about the health and well-being of their customers and help them follow their aspirations for a more balanced diet, rich in nutritious foods that are sourced consciously. This includes customers buying prepared foods at the supermarket, on-the-go lunches near work, or family meals at their favorite restaurant. At the same time, chefs are called upon to be educators, advocates, and guides through the complexities of our food system; they must be informed about key issues so that they can educate their customers who increasingly look to them to help when deciding what to buy and what to eat. Chefs matter.

A host of imperatives have reshaped how we view the scope of our concerns and responsibilities. From the pressing issues of obesity and diet-linked healthcare costs to the plethora of values and ethical views of our customers, our business has clearly changed. As we look to the future, with increased competition for declining resources, rising global populations, upward pressures on food costs, seismic changes in demographics, and more, it's obvious that business models and strategies will need to be adjusted—in some cases, substantially.

With the launch of our new Menus of Change initiative, a partnership with Harvard School of Public Health—Department of Nutrition, we are calling on chefs and industry leaders to help foster this change and to move beyond sometimes reactive, short-term business planning to a more integrated, proactive, forward-looking planning framework that acknowledges our need to continually reinvent ourselves and our businesses in anticipation of an ever faster pace of change ahead.

At the CIA, thought leadership and social responsibility are now as much a part of who we are as our commitment to advancing the culinary arts and technical standards of excellence—a commitment we reaffirm every day when both educating tomorrow's leaders and collaborating with today's decision-makers to further our industry. These are not separate concerns. To build a next generation of food choices and foodservice concepts that truly embrace health, sustainability, food ethics, and an accelerating diversity of consumer preferences, we need to spark more creativity and culinary insight in the form of successful business strategies that center around the best tasting food we can possibly produce and prepare.

From the consumers' perspective, taste and the "food experience" trump nearly all else, and therefore should be at the core of what drives innovation. Efforts to inspire new menu development, and advance public health and lighten our environmental footprint, will fail if customers don't find what's on their plates to be delicious, even craveable. That deliciousness starts at the source, and we must cultivate it at every stage of production, all the way to the plate.

We invite you to join our table, and this Menus of Change dialogue about the future of food. Come taste with us, explore the flavors that are going to redefine professional cooking, and add your voice to how we should be thinking—carefully, comprehensively—about what's ahead, five, 10, and 20 years from now.

In 2050, when world population will swell to nine billion, this year's bright, young culinary graduates will be firmly established in leadership positions in our industry. Let's work together today to forge out of the dark clouds of current challenges a new and bright horizon of opportunity—and new vectors of creativity and innovation—that truly secures their future, and the future of our industry.

Dr. Tim Ryan
President
The Culinary Institute of America

WELCOME TO MENUS OF CHANGE

Americans have never been more concerned about what to eat. And yet, more of us are asking chefs and the foodservice industry to make more choices, more often, about what ends up on our plates. Today, 48 percent of consumer food dollars are spent on food prepared in restaurants.

Those choices affect not only what's for dinner. They affect public health, the environment, culinary culture, and the profitability of dining establishments. Long-term trends, ranging from rising rates of obesity to climate change, already are reshaping opportunities and costs for the industry, from the largest foodservice and restaurant groups to small, independent eateries.

The good news is that the latest findings about what to eat from both public health and environmental science research are now converging with business needs and opportunities. Serving less meat, for instance, can help improve diners' health, reduce the level of greenhouse gases and pressure on limited resources such as water, and, if done carefully, enhance restaurants' bottom lines.

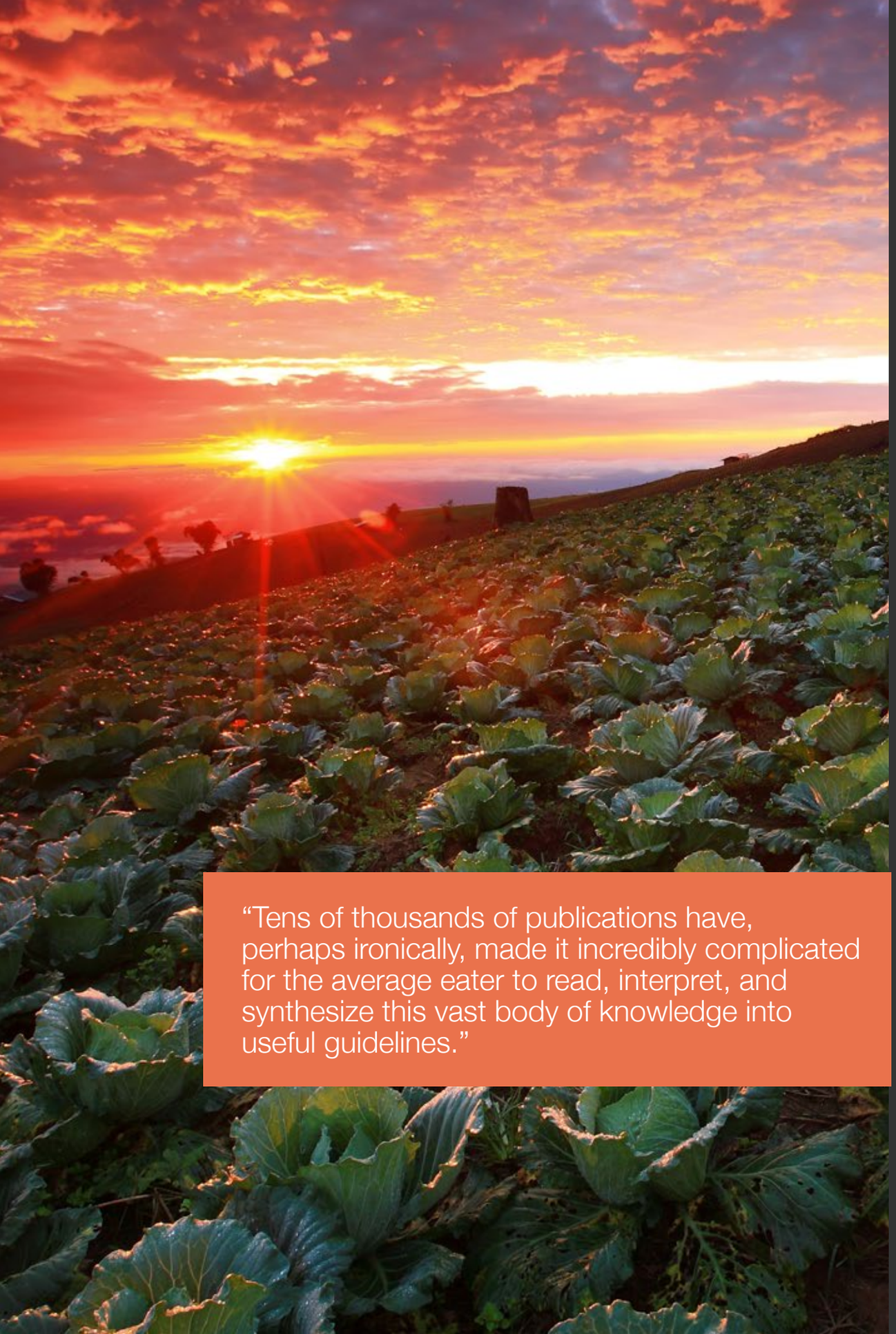
The Menus of Change initiative, a partnership of The Culinary Institute of America and Harvard School of Public Health—Department of Nutrition, aims to do the essential, difficult, and unprecedented work of integrating the latest findings from both nutrition and environmental science into a single set of recommendations to help foodservice and culinary professionals make better choices and successfully navigate the rapidly changing landscape

This annual report is a part of that mission. It aims to advance a long-term, practical vision that integrates optimal nutrition, environmental stewardship and restoration, and social responsibility within the foodservice industry. It represents a "GPS" to guide you through the key issues that face the foodservice community, and includes recommendations for improving business performance. It also provides a dashboard to show the progress the industry has made over the past year—where it is moving fast and where it needs to make greater efforts. The indicators on the dashboard will help businesses to evaluate their own efforts in the areas that matter most. For culinary professionals and R&D teams, there also is a comprehensive set of principles to guide menu development and design.

Along with the report, the Menus of Change initiative hosts an annual leadership conference for food-industry executives, culinary leaders, investors, entrepreneurs, and change makers to foster collaboration and speed progress in critical areas. It also informs educational programs for working chefs and culinary students at The Culinary Institute of America, and offers a platform to bring together culinary and investment professional to promote innovation in healthy and sustainable food concepts.

All of this work is supported by the energy, vision, and effort of two remarkable groups: the CIA Sustainable Business Leadership Council, made up of forward-thinking executives and chefs, investors, and change makers, and the CIA-Harvard Science and Technical Advisory Council, which brings together leading scientists and other experts working in the areas of nutrition, environment, food and agriculture, and business and management. Over the next several years, these two councils will continue to meet in an ongoing effort to help the industry sharpen its focus on the issues where it can make the greatest difference and combine rapidly evolving science and business imperatives to provide clear guidance to the profession.

The CIA and Harvard School of Public Health invite businesses to use this report to measure their progress and to navigate new and complex challenges. Not all culinary professionals and foodservice companies will take the same path forward. But most increasingly have a similar goal: to create and grow successful businesses serving healthy, sustainable, and delicious food.



> “Tens of thousands of publications have, perhaps ironically, made it incredibly complicated for the average eater to read, interpret, and synthesize this vast body of knowledge into useful guidelines.”

II. EXECUTIVE SUMMARY: A TASTE OF WHAT’S TO COME

PEOPLE. PLANET. PROFIT. THE “TRIPLE BOTTOM LINE” IS THE HOLY GRAIL FOR 21ST CENTURY BUSINESSES. BUT FOR RESTAURANTS AND FOODSERVICE, THE QUEST TO BOTH DO GOOD AND GROW CAN SEEM QUIXOTIC: GIVE THE PEOPLE WHAT THEY WANT AND THEIR HEALTH MAY SUFFER, FOR MAN CANNOT THRIVE ON A DIET OF BURGERS, PIZZA, FRIES, AND SODA. BUT GIVE THEM WHAT IS HEALTHY, LOCAL, AND SUSTAINABLE AND THE BUSINESS MAY OR MAY NOT SURVIVE.

The Menus of Change report is designed to help foodservice and culinary professionals balance competing priorities and make the hard choices that will allow them to continue to ably serve their customers, grow their businesses, and tackle key health and environmental imperatives—well into the future. It surveys the culinary and business landscape, highlighting the latest innovations and profiling companies in food production, distribution, and foodservice that have made healthy, sustainable food an ingredient for success. The report also includes commentary from a select, diverse group of chefs and restaurant operators about what challenges and opportunities they believe the future holds.

The centerpiece of Menus of Change is a concise analysis of 13 issues that sit at the intersection of public health, the environment, and the business of food. These summaries synthesize the latest health and environmental data to provide a clear picture of the industry’s challenges and opportunities, as well as practical next steps for foodservice operations. The report also assigns each issue a score that rates the industry’s efforts in these critical areas. These scores are featured in a summary dashboard on page 7. Menu of Change’s scores will be updated annually so that executives, entrepreneurs, and food-reform advocates can see at a glance where progress is being made and where there is still work to be done.

AMONG THE ISSUES COVERED ARE:

Protein Consumption and Production:
For the first time, Americans are eating less meat. Between 2011 and 2014, U.S. beef consumption is expected to decline by more than 12 percent. This may result in a small boost for health in the United States. But the growing demand for meat in the developing world means that intensive production will continue to adversely impact the environment. Chefs should create and market new and delicious plant-centric foods, feature meat in smaller portions less frequently, and focus innovation on the menu value proposition.

Fruit and Vegetable Consumption and Production: More than 90 percent of American farmland is planted with commodities such as corn and soybeans, rather than the fruits and vegetables that need to be more central to our diets. The average American eats just 1.6 servings of whole fruits and 1.4 servings of whole vegetables, less than half of what's recommended: enough to fill half our plates. Chefs should not feel constrained to exclusively support local growers—in some cases, produce grown farther away can have a lower environmental impact—but they should work with well-managed farms and distributors to incorporate more produce into seasonal menus.

Fish, Seafood, and Oceans: Overfishing is rampant in the vast majority of the world's fisheries. But pushing fish from the plate is not the answer. Chefs must expand choices beyond the usual shrimp, salmon, tuna, and white fishes in favor of a wider variety of fish from responsibly managed wild fisheries and aquaculture facilities and use their influence to persuade diners to try new species that reflect what the ocean ecosystem can sustainably provide.

Climate Change: More intense and frequent weather swings will bring unprecedented challenges to the farming community and, as a result, the foodservice industry. Chefs must work to source ingredients from farmers who use sustainable practices, as well as prioritize low-carbon foods on their menus. Chefs also must work to reduce their own environmental impact, as foodservice facilities have the highest energy intensity per square foot among commercial buildings in the United States.

Supply Chain Transparency and Resiliency: The efficient global food chain has successfully kept food cheap in the United States, but signs of strain are beginning to show. Severe weather and consumer panics over deadly bacterial outbreaks and mislabeled meat and seafood have cost millions of dollars and shaken, perhaps irrevocably, consumers' faith in the system. Foodservice operators must embrace technology, such as mobile data collection, to ensure a safe and steady supply of food.

Finally, Menus of Change provides comprehensive guidance for menu design that supports the triple bottom line. The **Principles of Healthy, Sustainable Menus** outlined here feature essential culinary strategies tied to sourcing, flavor insight, portion size, calorie quality, and more that are needed to increase the likelihood of success of new business models. Together, they point to a clear path to a new, more sustainable future for the culinary and foodservice sector.

STATE OF THE PLATE

How are we doing? Sometimes it's hard to tell. The Menus of Change dashboard on the next page provides a snapshot of the foodservice industry's recent progress to improve nutrition, sustainability, and profitability. Its scores on critical issues that affect the foodservice industry will be updated annually to show where progress is being made. It also creates a set of standards, which are designed to be used by businesses to judge their own efforts on sustainability.

DASHBOARD SCORE KEY:

The scores assigned to each issue indicates progress or lack thereof in the food industry and/or culinary profession over the last 12 to 18 months, as follows:

1: SIGNIFICANT DECLINE OR REGRESS

2: GETTING BETTER, BUT FAR FROM WHERE IT NEEDS TO BE

3. NO SIGNIFICANT PROGRESS

4. GOOD PROGRESS, WITH ROOM FOR MORE

5. SIGNIFICANT PROGRESS

METHODOLOGY

The scores were developed based on the expert opinions of the Menus of Change Scientific and Technical Advisory Council, who considered new research findings and trend data as well as innovations and change in business practices and policies, and were reviewed by members of the Sustainable Business Leadership Council to ensure they reflected new industry initiatives and practices.

2013/2014 MENUS OF CHANGE DASHBOARD

ISSUE	SCORE	JUSTIFICATION
DIET AND HEALTH: RECENT TRENDS		Modest improvements towards healthier diets include a large reduction in the intake of trans fats, a small reduction in sugar-sweetened beverages, and increase in whole fruits and whole grains.
PROTEIN CONSUMPTION AND PRODUCTION		Red-meat production and consumption in the United States is falling for the first time. Menu innovation is a contributor to progress.
FISH, SEAFOOD, AND OCEANS		Foodservice companies understand the importance of change, but implementation remains slow, and consumers remain unsure of how to make smart choices.
FOOD INSECURITY		The prevalence of food insecurity nationally has risen over the last decade and remains stagnant. The food industry should do more among the sector's very large workforce.
CLIMATE CHANGE		Modest but insufficient progress to date on food waste reduction and increased plant-centric menu innovation, but global supply chains remain brittle.
HEALTHCARE VERSUS HEALTHY FOOD SPENDING		Innovative programs are starting to link healthcare and healthy eating. But the connection is far from universal and more education is required.
ANIMAL WELFARE		Awareness is growing and important innovations are underway, but most meat still comes from industrial farms where conditions are not aligned with consumer ethics.
LOCAL FOODS AND THE FARM-TO-TABLE MOVEMENT		Increased sales of locally grown foods demonstrate progress, but the U.S. food system must dramatically change to meet population-wide health and sustainability imperatives and support consumer aspirations for more local and regional flavors.
CONSUMER ATTITUDES AND BEHAVIOR ABOUT HEALTHY AND SUSTAINABLE FOOD		Consumers remain confused by basic definitions of "healthy" and "sustainable." Consumers need to understand that choosing better ingredients is only a partial solution, along with changes to what and how much to eat.
CHEFS' INFLUENCE ON CONSUMER ATTITUDES		Chefs are very engaged in the movement for sustainability. But there needs to be additional focus on portion size, nutrition, and public health.
SUPPLY CHAIN RESILIENCY AND TRANSPARENCY		Supply chains remain opaque with serious consequences, including a growing consumer suspicion that some foods are not safe.
INNOVATIONS IN THE FOOD INDUSTRY		There is much experimentation, but dynamics that propel active capital investments are still new and evolving.
CHANGES IN INVESTMENT STANDARDS		Food companies have made improvements in defining and disclosing sustainability challenges and opportunities. Investors still see significant risk, particularly with regard to resource constraints.

OUR VISION


NUTRITIOUS AND HEALTHY
ENVIRONMENTALLY SUSTAINABLE
OUR VISION
SOCIALLY RESPONSIBLE AND ETHICAL
DELICIOUS
CULINARY AND CULTURAL APPEAL

OUR VISION

HEALTHY, SUSTAINABLE AND DELICIOUS

BUSINESS MODELS AND STRATEGIES

MENUS of CHANGE™

The Business of Healthy, Sustainable, Delicious Food Choices

THE FUTURE OF FOOD

INTEGRATED GUIDANCE FOR BUSINESS AND CULINARY LEADERS

GPS: A MODEL FOR CHANGE

PUBLIC HEALTH & NUTRITION SCIENCE ISSUES AND IMPERATIVES

ENVIRONMENTAL SCIENCE ISSUES AND IMPERATIVES

INTEGRATION OF PUBLIC HEALTH & ENVIRONMENTAL FINDINGS, TRENDS AND DRIVERS

VALUES, ETHICS AND CONSUMER PREFERENCES

SHAPING CONSUMER PREFERENCES / LEADING THE MARKET

CURRENT BUSINESS STRATEGIES AND MENUS

RISK & OPPORTUNITY ANALYSIS

CULINARY INSIGHTS

BUSINESS INSIGHTS

COST AND ECONOMIC TRENDS

SUCCESSFUL CHANGE

“The reduction in trans fats probably has been the main factor responsible for a reduction in bad cholesterol and an increase in good cholesterol in U.S. children and adults.”

III. GREEN SHOOTS: DELICIOUS SIGNS OF CHANGE

THE FOOD INDUSTRY IS IN A PERIOD OF REMARKABLE INNOVATION. TAKING THE LONG VIEW, SOME OF ITS LAST MAJOR INNOVATIONS WERE IMPLEMENTING THE BAR CODE AND WALKING UP TO A COUNTER TO PLACE AN ORDER. MORE RECENTLY, THE INDUSTRY’S FOCUS HAS BEEN PACKAGING, WITH BLOCKBUSTER PRODUCTS LIKE LUNCHABLES OR GO-GURT®.

But now, driven by concerns about health, sustainability, resource scarcity, and growing consumer interest in where food comes from, the food industry is devising products and services to satisfy consumer demands to protect public health and the planet. Today products, companies, and concepts exist that would have been impossible to imagine even a decade ago.

According to the research firm Technomic, 50 percent of consumers say they want to see healthier dishes in restaurants. Fast-casual concepts like Native Foods Café and Veggie Grill are answering that call. Both are 100 percent vegan and offer plenty of fruits and vegetables as well as soy proteins, such as seitan and tempeh, which they use for “meatball” subs and chipotle barbecue—items with plenty of crossover appeal. Launched in Palm Springs in 1994, Native Foods Café now has 14 locations, while Veggie Grill doubled its number of restaurants in 2012, from eight to 16 and plans to double its size again over the next year. Larger chains like The Cheesecake Factory, Red Robin Gourmet Burgers, and Burger King also are innovating in response to consumer eating habits and rising prices, and adding “burgers” made from poultry, fish, and plants.

Others are looking to the sea for innovative food sources. Ángel León, chef-owner of Aponiente in Cadiz, Spain, uses plankton to add umami to meat-free dishes like risotto, which he makes without butter or cream. For packaged foods, California company Solazyme Roquette Nutritionals has unveiled a commercial algal protein, which it grows in dark, commercial vats through a process called heterotrophic fermentation. The result is a sustainable, vegan, non-allergenic substance made up of 50 percent protein, 20 percent dietary fibers, and 10 percent healthy lipids, plus micronutrients and minerals. Aurora Algae is also racing to commercialize an algal protein. It is building a commercial plant in Western Australia where, via photosynthesis, it will grow a strain that feeds on nothing but sunlight and waste carbon dioxide.

Growing at a rapid clip is Revolution Foods, a pioneer in bringing “real food”—no high fructose corn syrup, no additives, preservatives, or hormones—to school lunches. Kristin Richmond and Kirsten Tobey conceived the company when they were students at the Haas School of Business at the University of California at Berkeley. They launched their first pilot program in 2006, replacing greasy rectangular pizza with meals like roasted chicken with yams, beans, and a locally grown peach. Today, Revolution Foods serves one million meals a week in more than 850 schools for prices only slightly higher than what it costs to serve typical school lunch fare.

Where possible, Revolution Foods sources locally and sustainably—and no wonder. Locally sourced and environmentally responsible foods took three of the top five spots on the National Restaurant Association's 2013 "What's Hot" list. Chipotle pioneered local and sustainable sourcing at scale; upstart chains like LYFE Kitchen and True Food Kitchen are following its lead, as are big companies like Darden's Seasons 52 restaurants.

SweetGreen, a salad-and-frozen-yogurt concept that began in Washington, D.C. and has expanded up the East Coast, sources 20 percent to 45 percent of its ingredients locally, depending on the time of year. Its new line of cold-pressed juices, dubbed Sweetpress, includes one called "Seasonal," a blend of watermelon juice, coconut water, lime, and mint. Food companies and chefs increasingly turn to intriguing flavor combinations to attract consumers. Foodpairing, a Belgian company that is helping cutting-edge chefs like Heston Blumenthal and David Kinch come up with tempting flavor matches, has developed software around ingredient combinations. For example, if a chef types in "cucumber," the program shows an interactive visualization of combinations that can pair well with that vegetable, such as mango, barramundi, pita chips, olive oil, and borage. It offers the potential to develop plates that use less meat, with positive results for the planet and diners' health. For a similar service, larger restaurant groups and food manufacturers can turn to Food Genius. The Chicago-based startup mines industry data to help companies figure out what to make, how to package it, market it, and how much they can charge.

Almost as important as what goes on the plate is what gets thrown away. Companies are sprouting around the country to pick up and process kitchen grease into biofuel—and they are paying restaurants for the privilege. Firms such as EnviRelation and EcoMovement are hauling away food scraps for composting.

No longer forgotten are the workers who produce our food. The Coalition of Immokalee Workers, a group that represents Florida tomato pickers, has grabbed headlines for making deals with companies including Chipotle, Taco Bell, Burger King, and McDonald's. Less well known are efforts like those of the Equitable Food Initiative, comprised of major food buyers such as Costco, growers, and farmworker groups. The group is currently drafting standards for working conditions, pesticide use, and food safety, which will be used to certify growers and their food.

Taken together, this new set of 21st century values and economic incentives have created a restaurant and foodservice industry as dynamic as any in history.

“More than 90 percent of American farmland is planted with commodities such as corn and soybeans, rather than the fruits and vegetables that need to be more central to our diets.”

IV: NUTRITION, HEALTH, SUSTAINABILITY, AND FOOD ETHICS: SCIENCE AND POLICY HIGHLIGHTS

THE FOLLOWING SERIES OF ESSAYS SUMMARIZES THE COMPLEXITY OF NUTRITION AND ENVIRONMENTAL SCIENCE TO PROVIDE CLEAR GUIDANCE FOR CULINARY PROFESSIONALS WHO HOPE TO OFFER HEALTHY AND SUSTAINABLE CHOICES. THIS SECTION ALSO LOOKS AT NATIONAL ECONOMIC TRENDS THAT SUGGEST NEW WAYS THE FOOD INDUSTRY CAN POSITIVELY IMPACT PUBLIC HEALTH.

DIET AND HEALTH: RECENT TRENDS

Over the last several decades, researchers have exhaustively studied the relationships between what we eat and our health, in particular diseases such as cardiovascular disease, cancer, and total mortality. This has included experiments in animals; controlled feeding studies in humans lasting for several weeks among a few dozen subjects; large epidemiologic studies with several decades of followup, and a limited number of randomized trials in humans. While some of these studies have been enlightening, the resulting tens of thousands of publications have, perhaps ironically, made it incredibly complicated for the average eater to read, interpret, and synthesize this vast body of knowledge into useful guidelines. And so another wave of papers were published to review the literature and develop conclusions. But many of them also had limitations as a result of gaps in the scientific literature, which remains a work in progress, the limited perspectives of some of the committees, and sometime conflicts of interest.

One of the most influential review processes has been the U.S. Dietary Guidelines, which is intended to provide guidance to individuals, institutions, and federal policies related to food. Mandated by Congress, the United States Department of Agriculture updates its guidelines every five years. It also created the Healthy Eating Index (HEI), a scoring system that can be used to rate the diets of individuals or the menus of foodservice operations based on adherence to its guidelines. In 1995, however, researchers at the Harvard School of Public Health were concerned that the U.S. guidelines were inconsistent with the best available scientific evidence.

They decided to use data on dietary intakes reported by over 100,000 men and women to determine whether those who adhered most closely to the federal guidelines had lower risks of cardiovascular disease, cancer, and other major chronic diseases, compared to those who adhered less well. Although this would seem to be a minimal criterion for dietary guidelines, this was the first time any guidelines had been evaluated this way. Disappointingly, after accounting for tobacco use, physical activity, and other factors, there was little relation between adherence to the Dietary Guidelines and the risk of major chronic disease. Thus, these investigators developed an alternative Healthy Eating Index (aHEI) based on the best available published literature, taking into account findings from short-term studies in humans of the effect of different diets on blood cholesterol fractions and other risk factors and also long-term prospective epidemiologic findings. Emphasis was given to findings that were supported by both types of evidence.

Using the same populations in which the HEI had been evaluated, the Harvard investigators documented that better adherence to its own alternative index did predict lower risk of major chronic disease. This finding was confirmed in other large populations. During subsequent five-year updates, the U.S. Dietary Guidelines have evolved to be closer to Harvard's alternative index. But because scientific evidence has continued to accumulate, the Harvard group updated its guidelines as the Alternative Healthy Eating Index 2010 (AHEI 2010), and has recently published an analysis examining both the USDA HEI 2005, the most recently available, and the AHEI 2010 in relation to risk of major chronic diseases. As expected, the scores were strongly correlated. Now adherence to both predicted better health outcomes, although the AHEI 2010 did so somewhat more strongly.

For the Menus of Change process we have elected to use the elements of the Alternative Healthy Eating Index 2010 as the primary focus for evaluating healthfulness of diets. These have considerable overlap with the USDA's criteria but tend to be more intuitive, and also most directly supported by evidence. (For example for political reasons the USDA refers to "added sugar" and the AHEI refers to soda and other sugar-sweetened beverages; the USDA refers to "solid fat" and the AHEI refers to red meat and dairy fat). As noted, the AHEI 2010 was a stronger predictor of health outcomes when all elements were combined.

Notably, the elements of the AHEI 2010 closely resemble those of the traditional Mediterranean diet, which has been associated with lower risks of many adverse health outcomes. In many respects, the Mediterranean diet serves as a gold standard. But understanding of the key elements allows its principles to be incorporated in diets of many flavors and nationalities.

DIVERGENCE OF SCIENCE FROM CONVENTIONAL BELIEFS

Conventional wisdom is often flawed, and the widely held beliefs about healthful eating are no exception. The Harvard Alternate Healthy Eating Index rates diets based on science with which some may not be familiar. Several topics in particular merit explanation because of their divergence from commonly held beliefs:

1. "Low fat" is not an appropriate diet goal. Low-fat diets were all the rage in the 1980s and 1990s. But new, strong evidence has shown that it is the type of fat in the diet, rather than the percentage of total fat, that is linked to heart disease. Moreover, low-fat diets are not effective for long-term weight control. Specifically, the AHEI recommends that trans fats from partially hydrogenated vegetable oils be avoided, and unsaturated fats from vegetable oils should be used to replace saturated fat when possible. Saturated fat itself is similar to most carbohydrates in its relation to heart disease, and replacing it with carbohydrates has no benefit and can be harmful if those carbohydrates are refined starch or sugar.

2. Lean cuts of red meat are not the answer. Reducing saturated fat is not beneficial if replaced by carbohydrates, but replacement with unsaturated fats will have multiple health benefits. Therefore, simply reducing the fat content of red meat likely will have minimal benefits because this is often replaced by calories for refined starches and sugar. Moreover, other evidence suggests that higher intake of red meat, irrespective of its total fat content, increases risks of heart disease and diabetes if compared to poultry, fish, eggs, nuts, or legumes. Environmental assessments lead to similar conclusions about protein choices: Selecting better types of red meat or eating "nose to tail" are not the best choices because red meats have an outsized impact on the land, water, and climate compared to poultry, fish, and plant-based proteins.

Table 1 illustrates the greenhouse-gas emissions associated with several common protein sources and is a good indicator of environmental impact including energy and chemical use, soil management, and mechanical irrigation. Both public health and the environment will improve if restaurants decrease the amount of red meat on menus and replace them with alternative protein sources.

3. Contamination and environmental risks should not deter consumption of seafood. A recent report that fish, specifically farmed salmon, had been contaminated by industrial chemicals triggered a widespread scare that led many people to reduce their consumption of fish. But there was no evidence that the amounts of the chemicals found were enough to cause human disease.

Some species of fish, such as tilefish and tuna, do contain mercury, mainly from natural sources, and these fish should not be consumed by pregnant or lactating women. However, the risk derived from theoretical calculations is vastly outweighed by the benefits of eating seafood. It is extremely important that pregnant women do not avoid fish in general because a generous intake of Omega-3 fatty acids is needed for neurological development of the fetus. Reports about overfishing and damaging aquaculture practices also have put some people off seafood. But the worries generally concern a handful of popular commercial species such as tuna, cod, salmon, and shrimp. Eating a wider variety of fish species, both wild and farmed, is a simple measure that would go a long way towards maintaining a healthy diet and addressing environmental concerns.

Table 1

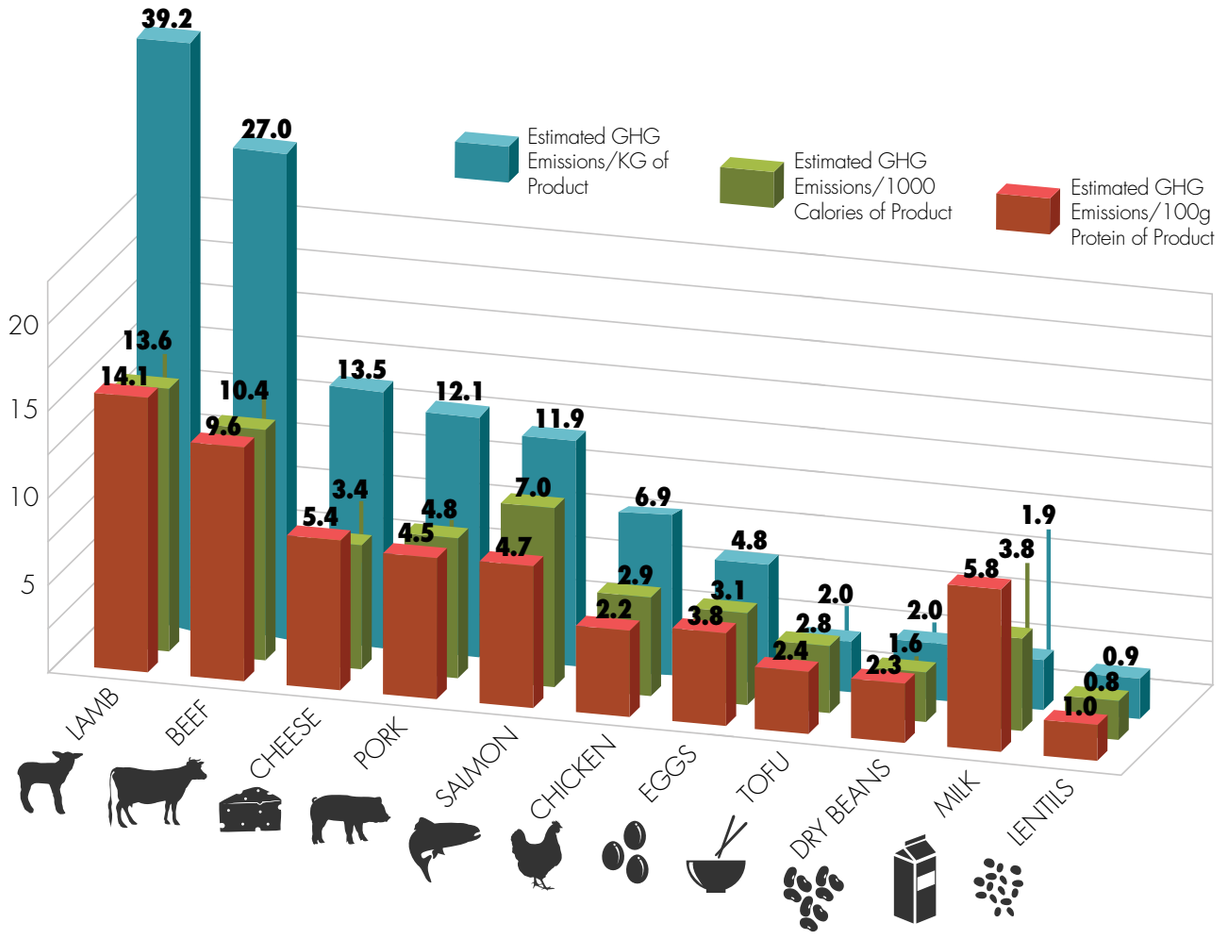


Table 1 Greenhouse Gas Emissions for Select Protein Sources
Based on data from Clean Metrics / Environmental Working Group, Meat Eaters Guide, Methodology, 2011. Estimates of GHG production for total lifecycle, from farm to table. These are estimates of typical or average GHG production, and this can vary substantially for each type of protein source depending on details of production methods. Note: The GHG production is best expressed per calorie or protein, rather than per kilogram, because some foods, such as milk, are mainly water.

***Calorie Reference:** USDA National Nutrient Database for Standard Reference, Release 25: Energy (kcal) Content of Selected Foods per Common Measures, https://www.ars.usda.gov/SP2UserFiles/Place/12354500/Data/SR25/nutrlist/sr25a208.pdf
****Protein Reference:** USDA National Nutrient Database for Standard Reference, Release 25: Energy (kcal) Content of Selected Foods per Common Measures, https://www.ars.usda.gov/SP2UserFiles/Place/12354500/Data/SR25/nutrlist/sr25a203.pdf

INDICATORS OF DIETARY QUALITY

The elements of the AHEI 2010 are described below, each with a brief scientific rationale. The scientific literature on each of these is large, and a more extensive discussion of these topics is beyond the scope of this report. The indicators are discussed in more detail and with additional references on the Harvard School of Public Health website, Nutrition Source (www.nutritionsource.org).

Vegetables: Vegetable consumption has been associated with lower risk of cardiovascular disease, in part because vegetables are a major source of potassium, which reduces blood pressure, but other components may also contribute to this lower risk. The relation with vegetable consumption and cancer risk is much weaker than previously believed, but some modest benefit is likely for specific forms of cancer. Potatoes (including baked, mashed, and french fries) are not included as a vegetable because they are a major source of starch and have not been associated with lower risk of chronic disease in epidemiologic studies and also are associated with increased risk of diabetes.

Whole Fruits: Fruit consumption has been associated with lower risk of cardiovascular disease and some cancers. The AHEI included only whole fruit in our definition, as fruit juice is not associated with lower risk of cardiovascular disease or cancer and may increase risk of diabetes.

Whole Grains: Greater consumption of whole grains is associated with lower risk of cardiovascular disease, diabetes, and possibly colorectal cancer. Conversely, refined grains are not associated with lower risk, and may increase risk of diabetes, coronary heart disease, and other chronic diseases. In calculating whole-grain intake, the AHEI uses grams of whole grains, which accounts for the variability of the percent of whole grains in a range of "whole grain" products.

Nuts and Legumes: Nuts, legumes, and vegetable protein (e.g., tofu) are important sources of protein and contain important constituents such as unsaturated fat, fiber, copper, magnesium, plant sterols, and other nutrients. Nuts and other vegetable proteins have been associated with lower risk of cardiovascular disease, especially when used as a substitute for other protein sources, such as red meat. Nuts are also associated with lower risk of diabetes and weight gain.

Fish (EPA + DHA): One or more servings of fish per week, specifically species high in long-chain (n-3) fatty acids EPA + DHA, is strongly protective against fatal cardiac arrhythmias and sudden cardiac death. This also may lower the incidence of other cardiovascular diseases.

Polyunsaturated Fat: Replacing saturated fats with polyunsaturated fats leads to positive changes in blood cholesterol fractions, is associated with a lower risk of coronary heart disease, and may lower risk of Type 2 diabetes. In contrast, a low-fat diet has had no beneficial effects on cardiovascular-disease risk factors, lipid profile or blood pressure, and did not reduce the risk of cardiovascular disease, breast cancer, colon cancer, or total mortality. Monounsaturated fats also have beneficial effects on blood lipids. In practice, replacing saturated fats with polyunsaturated and monounsaturated fats means using liquid vegetable oils instead of butter, lard, or partially hydrogenated fats wherever possible.

Trans Fats: Trans-isomers of fatty acids, formed by partial hydrogenation of vegetable oils to produce margarines and vegetable shortening, are associated with higher risk of coronary heart disease and diabetes. Fortunately, use of these has been greatly reduced. The AHEI recommends that partially hydrogenated fats be avoided completely.

Red and Processed Meat: Consumption of red meat and processed meat is associated with greater risk of coronary heart disease, especially when substituted for nuts, poultry, or fish. Red meat and/or processed meat are also associated with higher risk of stroke, diabetes, and colorectal and other cancers, and total mortality. The greater risks of cardiovascular disease are mediated in part by the higher amounts of saturated fat and cholesterol in red meat, but other factors are also likely to play a role.

Sugar-Sweetened Beverages: Intake of sugar-sweetened beverages, including soda and fruit drinks, is associated with increased risk of weight gain and obesity, cardiovascular disease, diabetes, and gout. The AHEI included intake of fruit juice in this category, given the positive association with risk of diabetes, and lack of beneficial effects on cardiovascular disease or cancer, as has been seen for whole fruits.

Sodium: High sodium intake increases blood pressure, and salt-preserved foods are associated with greater risk of stomach cancer, cardiovascular disease, and total mortality. Further, sodium-reduced diets significantly lowered the risks of high blood pressure and cardiovascular disease in clinical trials. Reductions in sodium intake to 2,300 milligrams per day as recommended by the USDA would prevent a large number of new cases of cardiovascular disease.

DIETARY FACTORS NOT INCLUDED AS INDICATORS

1) Alcoholic Beverages: Strong evidence indicates that moderate consumption of alcoholic beverages reduces risk of heart disease and diabetes. However, even at these moderate levels, risk of breast cancer is increased, and alcohol consumption increases risk of traffic injuries and abuse. Because of these competing risks and benefits, which depend in part on age and family history of alcohol dependence, this topic was deemed too complex to be useful as an indicator of diet quality for an overall population.

2) Coffee and Tea: The health effects of these beverages have been studied extensively, and they are safe and good alternatives for sugar-sweetened beverages. Some health benefits have been seen for coffee, especially a reduction in risk of diabetes. But because coffee intake is often limited by side effects of caffeine, and tea seems to be neutral with respect to health, they were not included as indicators.

3) Milk, Cheese, and Other Dairy Products: Milk has been widely promoted as essential for adequate calcium intake and bone health. However, the basis for the calcium requirements in the United States is dubious—they are much higher than the World Health Organization's definition of adequate intake—and recent studies do not show any reduction in bone fractures with high dairy consumption. Also, high consumption of dairy products puts large amounts of saturated fat into the food supply. For these reasons, greater consumption has not been included as an indication of higher dietary quality.

Although there is not sufficient reason to promote higher consumption of dairy products in general for health reasons, moderate consumption of one or two servings a day can add variety and flavor to diets and may contribute to diet quality, depending on the other aspects of a person's diet. Consumption of cheese has been increasing dramatically over the last several decades in the United States, becoming almost de rigueur in salads and sandwiches. This provides large amounts of sodium along with less healthy fats and many calories. Smaller amounts of cheese and use of alternative ways to add flavor and variety to these foods would be desirable. Recent data suggest that consumption of yogurt may be associated with reduced weight gain, and this deserves further investigation. Of particular concern are the large amounts of sugar added to milk and many yogurts. Minimizing added sugar and using the natural flavor of yogurt to advantage should be a goal.

Figure 1

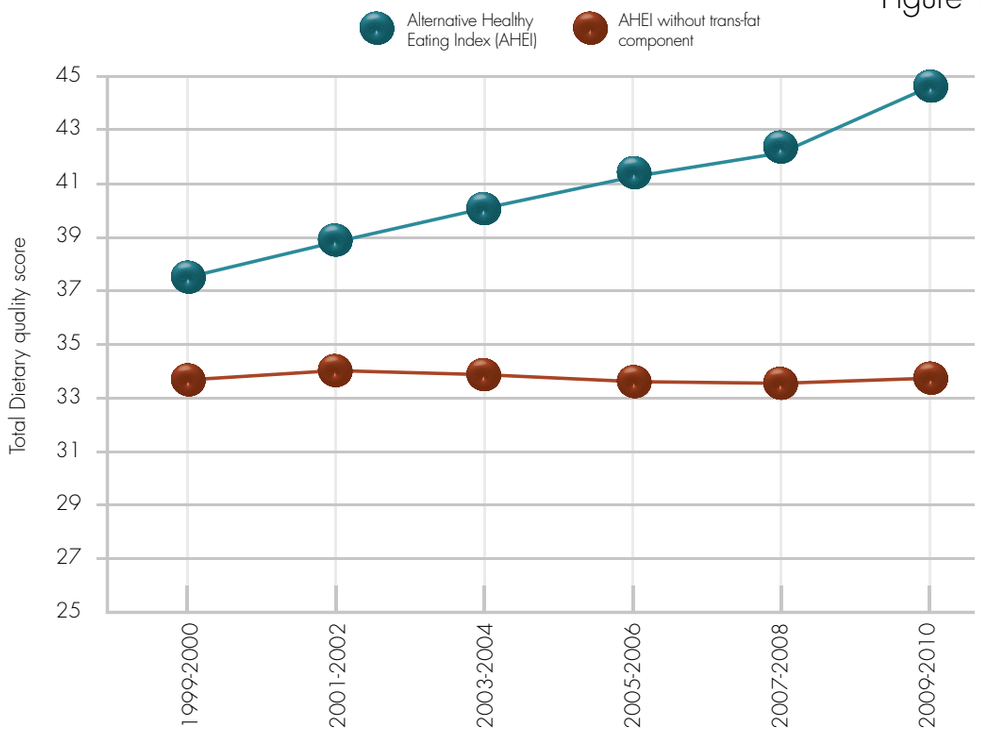


Figure 1: Total dietary quality score measured by the AHEI-2010 among participants aged 20 years or older with different genders by NHANES study period.

Figure 2

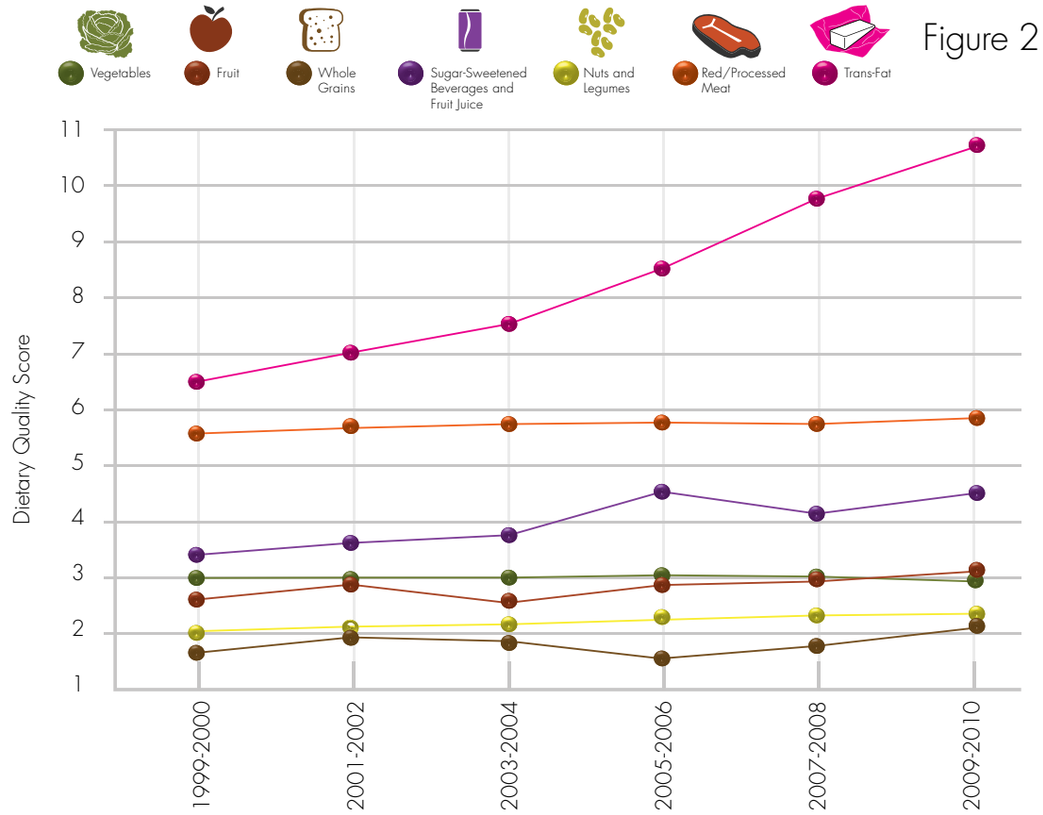


Figure 2: Dietary quality scores for each AHEI-2010 component among participants aged 20 years or older by NHANES study period.

Figure 3

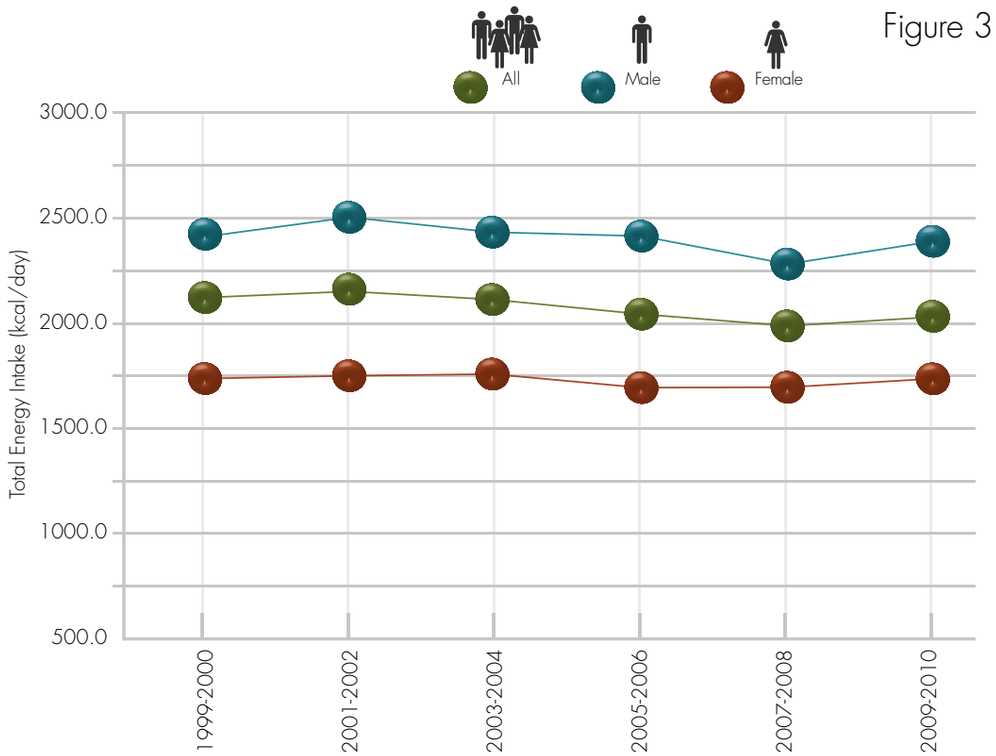


Figure 3: Energy intake among study population by NHANES study period for adults age 20 years and older

Figure 4

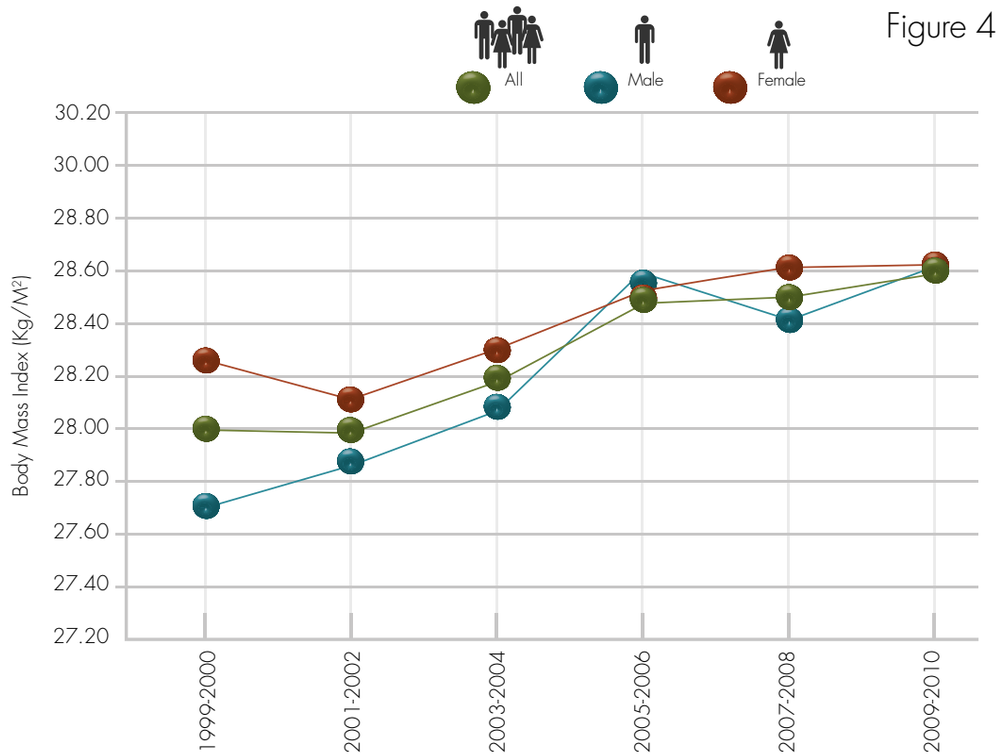


Figure 4: Age-adjusted body mass index among participants aged 20 years and older with different genders by NHANES study period.

TIME TRENDS IN KEY DIETARY INDICATORS

In an effort to judge whether American diets are becoming more healthful for this report, investigators from the Harvard School of Public Health applied the standards established in the Alternative Healthy Eating Index to national survey data for the United States. Each variable is scored from 0 to 10, with 10 being the healthiest. Thus, for polyunsaturated fat, whole fruits, vegetables, whole grains, nuts, and legumes, a higher score means higher intake. For trans fat, sugar-sweetened beverages and fruit juice, red and processed meat, and sodium, a higher score means lower intake. The total score is the sum of the individual elements; 100 would be perfect.

For this report, we used data for persons 20 years of age and older from 1999 through 2010, the latest available data from the U.S. National Health and Nutrition Examination Survey (NHANES), which is a representative national sample of the U.S. population. Complex foods, such as a soup or stew, were dissected so the individual components were included as red meat, vegetables, etc. Intake of trans fat is not available from the NHANES, so data from the late 1990s and 2010 were used to estimate the national trend.

Figure 1 shows that the average AHEI-2010 diet quality score increased slowly but steadily for both men and women, from an average of 37.6 in 1999 and 2000 to 44.4 in 2009 and 2010, an increase of 6.7 points. However, half of the increase in the overall score was due to the large reduction in trans fat intake; if this is excluded, the average score increased by 3.3 points over the same time period.

Figure 2 illustrates that dietary scores improved most for trans fat (decreased intake), followed by whole fruit (increased intake) and sugar-sweetened beverages and fruit juice (decreased intake). In the most recent years whole-grain intake also increased. Red-meat consumption has not changed appreciably, following a small decline (increase in score) from 1999 to 2000 and 2001 to 2002. Intakes of nuts and legumes have increased slightly, but other dietary scores have not changed appreciably, including intake of sodium.

The reduction in trans fat intake probably has been the main factor responsible for a reduction in LDL (bad) cholesterol and an increase in HDL (good) cholesterol in both U.S. children and adults during this same period.

Although not included in the AHEI-2010 diet-quality score, total caloric intake is of interest because of its relation with obesity and weight gain. As seen in Figure 3, total energy intake among adults decreased slightly during the same time period, on average by approximately 100 calories per day. However, as shown in Figure 4, Body Mass Index (BMI), a measure of weight adjusted for height, increased over this period; a plateauing may have occurred during the last four years. The failure to see a decline in BMI despite the small reduction in reported caloric intake might be due to a subtle drift in dietary assessment methods, a reduction in physical activity, or an increase in watching television or other highly inactive past times.

Although the overall improvement in diet quality is encouraging, the scores remain poor, and room for vast improvements remain. For example, the average daily servings of whole fruits and vegetables were 1.6 and 1.4, respectively versus 2.1 servings of sugar-sweetened beverages and fruit juice.

Women ate just one serving of whole grains, while men ate 1.3 servings. Sodium intake remained at approximately 3,400 milligrams per day.

It is also noteworthy that the NHANES data that the Harvard School of Public Health analyzed shows improvement in diet through 2010 and does not include the effects of many public-health promotion campaigns and changes in foodservice operations since that time designed to increase our consumption of fresh fruits and vegetables and whole grains while reducing our intake of red meat. From the White House Garden to Meatless Monday, improving dietary quality has become a part of the national conversation that hopefully will lead to more rapid improvements.

SCORE: 4

Modest improvements towards healthier diets include a large reduction in the intake of trans fats, a small reduction in sugar-sweetened beverages, and increase in whole fruits and whole grains.

PROTEIN CONSUMPTION AND PRODUCTION

Over the past several decades, meat production and consumption have soared worldwide. Global production rose to 297 million tons in 2011, more than five times as much as in the 1950s, and average meat consumption per capita was 174 pounds in industrialized countries and 70 pounds in developing countries. Worryingly, the developing world is catching up: Over the last decade, meat production has increased nearly 26 percent in Asia, 28 percent in Africa, and 32 percent in South America. Since 1995, developing countries have seen per-capita meat consumption grow 25 percent versus 2 percent in industrialized countries, a 15-percent increase overall.

The global increase in meat production has severe environmental impacts, as the livestock industry contributes to problems of land degradation, climate change, air pollution, water shortage and water pollution, and a loss of biodiversity.

The reason is simple: Intensive animal agriculture relies on turning plants into animal feed and takes several pounds of plant-based feed to produce a single pound of meat. This concentrates all of the impacts of farming soybeans, corn, wheat, sorghum, and other pulses and grains into a much smaller amount of food for people. Put another way, it takes about 39 acres of farmland to produce 1,000 kilograms of ground beef for hamburgers and only three-quarters of an acre to grow 1,000 kilograms of potatoes to serve along with them. It takes one-sixteenth of an acre to produce 1,000 kilograms of carrot sticks, the healthier choice.

For foodservice operators, this also concentrates the price and cost volatility. These grains used for feed will become harder to produce in a world with greater swings in weather and a restricted water supply.

The consumption of meat also has substantial impacts on human health. Diets that include substantial amounts of red meat and products made from these meats, including lean red meat but especially such items as bacon, hot dogs, sausage, salami, and bologna, increase risk of diabetes, heart disease, and some cancers. In addition, higher consumption of red meat, especially processed red meat, increases risk of premature death.

It is estimated that nearly 10 percent of deaths could be prevented if all American adults cut their current red meat consumption to less than one half a serving of red meat per day (approximately one-and-a-half ounces). Substituting one serving of red meat per day with foods including fish, poultry, nuts, legumes, low-fat dairy, and whole grains can decrease risk of premature death by 7 percent to 19 percent, as well as reducing the risk of diabetes and heart disease.

The mix of health and price concerns (driven in part by persistent droughts) as well as a growing awareness of meat production's environmental impact has significantly affected consumption in the United States, where trends are headed in a very different direction than most of the world. Between 2011 and 2014, U.S. beef consumption is expected to decline by more than 12 percent. Over the past decade, beef production has dropped almost every year including three of the largest drops in the past 35 years. Chefs can claim at least some significant responsibility as the use of chicken breast, a lean protein, doubled between 2009 and 2012 and there has been a 22 percent rise in vegetarian menu items. The foodservice industry also has changed the menu for everyday dining as it has embraced campaigns like Meatless Monday and challenges to make half of each plate fruits and vegetables.

RECOMMENDATIONS:

Chefs and the foodservice industry should continue to help shape our food habits to favor healthy and sustainable proteins, especially plant-based proteins, but also poultry and fish, while looking for ways to use red meats in small portions. This approach also can help foodservice operators better manage costs as climate and other factors make farming and livestock production less predictable. Chefs also have a responsibility to create a new aspirational vision for dining throughout the world—one that builds appeal and excitement around plant-based foods—as other countries experience rising affluence and look to embrace the Western eating habits that chefs have helped to foster.

SCORE: 4

Red meat production and consumption in the United States is falling for the first time. Menu innovation is a contributor to progress.

FISH, SEAFOOD, AND OCEANS

Overfishing is rampant in the vast majority of the world's fisheries. Global seafood production totals about 154 million metric tons, or $217.5 billion, but that is only part of the story. Illegal, underreported, and unregulated fishing accounts for an additional $10 billion to $23 billion. According to the United Nations Food and Agriculture Organization (UN FAO), 80 percent of the world's fish stocks are fully exploited, over-exploited, or depleted. And yet, demand for seafood is expected to triple within the next few decades.

Today, foodservice and restaurants focus their menu offerings on a small number of species, which exacerbates issues related to human health and the health of the oceans. More than half of the seafood consumed in the United States is shrimp, canned tuna, and salmon. Just 10 species make up 90 percent of the seafood we eat.

Some of the popular fish served are still good choices for foodservice. Alaskan pollock, for example, is certified by the Marine Stewardship Council. In 2013, McDonald's announced it would purchase only Alaskan pollock for its Filet-O-Fish and Fish McBites.

But the overall, intense fishing to harvest ever-increasing amounts of just a handful of species along with produce feed for aquaculture operations has caused great harm to the ocean's ecosystem. Indiscriminate use of bottom trawls can destroy long-lived coral reef habitats. Long-lining, a method in which thousands of hooks are strung out across miles of line, can trap large numbers of turtles, sharks, marine mammals, and seabirds. The relentless pursuit of popular fish disrupts marine food chains by leaving some predators without their traditional prey. The pressure to provide the most popular species has led to many instances of fraud in supply chains. Finally, the practice of discarding non-targeted species, called bycatch, is wasteful. According to the UN FAO, nearly 30 percent of fish caught are thrown back dead and bring no benefit to the human diet or economy.

Aquaculture, which now produces about as much seafood as the wild catch, can relieve some pressures on fisheries, but it is not always practiced in ecologically sound ways. Farmed fish can escape and intermix with native species, while site selection of some farming operations has led to pollution. And some farmed fish—salmon and other carnivorous species—are reliant upon inputs of antibiotics and large amounts of feed fish. In 2010, 15 million metric tons of wild seafood was reduced to make fish meal and fish oil.

Sustainable aquaculture models do exist, however. For example, pangasius (a species of river catfish) requires minimal fish-based feed and can withstand very high cage densities.

Barramundi produces high levels of Omega-3s, even when fed a mostly vegetarian diet, and has the sweet flavor and meaty texture that chefs love. Species that are low on the food chain, such as mussels, clams, and oysters, can be farmed in ways that help to improve the health of ecosystem and to keep traditional marine food production areas active and profitable.

Some seafood can have harmful levels of accumulated environmental toxins such as PCBs, dioxins, and methyl-mercury. While exposure to these toxins should be limited, especially by pregnant and nursing mothers, the benefits of increased Omega-3 intake make seafood a good choice when selecting animal proteins. Many options exist for high-omega and low-toxin seafood. Generally it is best to mitigate risk by eating a diverse variety of seafood.

RECOMMENDATIONS:

About two-thirds of seafood consumed in the United States is eaten in restaurants. This offers the foodservice industry a unique responsibility and opportunity to ensure the health of the oceans.

The foodservice industry should expand choices beyond the usual shrimp, salmon, tuna, and white fishes in favor of a wider variety of fish and seafood from well-managed wild fisheries and aquaculture facilities. Smaller fish and seafood that are lower on the food chain, such as mollusks and sardines, are good options, as are herring, anchoveta, mackerel, and a host of farmed species such as tilapia, swai, pangasius, and barramundi. But shifting our focus to only these new species is not the answer.

That will simply cause more overfishing, but of different species. Chefs can use their influence to persuade diners to try new fish and seafood. This, in turn, will allow fishermen to focus on what ecosystem can sustainably provide.

Foodservice and culinary professionals also must demand traceability for the seafood they receive. Studies by Oceana, a leading ocean advocacy organization, reveal that in many major metropolitan areas, seafood is fraudulently mislabeled more than 30 percent of the time. Without transparency and traceability, any effort at responsible purchasing is easily undermined.

Finally, restaurants and foodservice operations must train staff to communicate the importance of these issues and to explain changes to menus. The New England Aquarium, Monterey Bay Aquarium, and other groups such as Chefs Collaborative all provide education and training tools.

SCORE: 2

Foodservice companies understand the importance of change, but implementation remains slow, and consumers remain unsure of how to make smart choices.

FOOD INSECURITY

In 2011, an estimated 17.9 million, or one in six, U.S. households were food insecure, meaning that they had difficulty, at some time during the year providing enough food for everyone in their household. Almost seven million of these households were forced to skip meals or reduce their food intake by cutting back on food portions. In severe cases, both adults and children went hungry. Half a century after the nation's War on Poverty, hunger is still a reality in America.

At greatest risk for food insecurity are households with children; Black, non-Hispanic, and Hispanic households; and households with incomes below 185 percent of the poverty level, or $23,550 for a family of four. Ironically, many foodservice and agricultural workers are among those who struggle to feed themselves and their families. A 2012 study conducted by the Food Chain Workers Alliance found that food-industry workers face higher levels of food insecurity than the rest of the U.S. workforce and use Supplemental Nutrition Assistant Program (SNAP) benefits, formally known as food stamps, at double the rate of individuals working in other industries.

Despite the innocuous sounding label, food insecurity is a dire condition and has been linked to inadequate intake of important nutrients, behavioral and psychosocial dysfunction, cognitive deficits, and health problems including obesity. The majority of food-insecure households meet their food needs by relying on government assistance programs; reducing the quality, variety, or desirability of their diet; and visiting emergency food pantries.

Government programs are a bulwark against hunger. But more is needed to effectively address—and eliminate—food insecurity, especially in low-income neighborhoods, which tend to have less access to stores that sell nutritious foods than higher-income, white neighborhoods. Studies also have found that restaurants in low-income neighborhoods offer their customers fewer healthy menu options than restaurants in high-income neighborhoods. Programs such as Share Our Strength's Cooking Matters, which teach families how to stretch their food dollar and cook nutritious meals, are an effort to address these problems. Such programs have the potential to increase access to healthy foods through increased demand.

RECOMMENDATIONS:

There are multiple ways culinary professionals and food business owners and operators can play an important role in tackling food insecurity. Culinary professionals can share their food skills and knowledge through programs that teach cooking and budgeting skills to low-income families. Given disparities in access to healthy menu choices in restaurants, culinary professionals should offer competitively priced healthy items and food-preparation options. As employers to 20 million people, food-industry owners and operators also should look for ways to provide livable wages and adopt employment practices that enhance food workers' well being. They should encourage their suppliers to do the same, and communicate to their customers why that is part of an all-encompassing strategy toward reducing food insecurity.

SCORE: 3

The prevalence of food insecurity nationally has risen over the last decade and remains stagnant. The food industry should do more to help protect and empower the sector's workforce.

CLIMATE CHANGE

The specter of increasing weather volatility and a changing climate are all around us. From the melting of polar ice caps to extreme events like Superstorm Sandy, changing weather patterns in the United States and internationally have become hard to ignore: 2012 was the hottest year on record since 1895 and insured weather-related losses reached $44 billion in 2011, topped only by 2005 when Hurricanes Katrina, Rita, and Wilma hit the Gulf Coast.

The world's food supply, rooted as it is in agricultural systems and natural cycles, will be in the bulls-eye of a changing climate. While these dynamics may seem far from the plate, they are likely to have increasing impact on the culinary and foodservice industries in the years ahead. Recent analyses paint a stark picture for the U.S. agricultural system including the prospects of an increasing number of severe weather events; changes in rainfall patterns, with increased risk of flooding and drought; and altered rate of plant growth and crop ripening that may affect yields and waste rates, among others.

These dynamics are of growing concern among food-industry leaders. For instance, a 2012 survey of 350 executives from leading North American food and agribusiness companies found that 68 percent said weather extremes and volatility will be the "single biggest factor affecting North American food and agribusiness in 2013." That concern far outweighed the next two closest factors—consumer demand (13 percent) and policy and regulation (10 percent).

A 2012 analysis by the Institute for Agriculture and Trade Policy in conjunction with Compass Group USA/Foodbuy substantiated such concerns.

Fruit and vegetable distributors reported increasing weather anomalies in recent years, such as early and late freezes and heavy rains during the "dry season" in tropical zones. They also saw increasing price volatility, in part due to extreme weather events, and the need for additional backup sources of supply both within and outside the United States.

More intense and frequent weather swings will bring unprecedented challenges to the farming community, and as a result to the foodservice industry. More family farms are likely to be lost as repeated weather crises overwhelm farmers' financial reserves. A dearth of public and private crop insurance for fruit, vegetable, and diversified farm operations leaves many such farmers especially vulnerable and without the safety net that is provided to producers of corn, soybeans, and other commodities.

But the industry is also a major contributor to the greenhouse gases that lead to climate change. Foodservice facilities have the highest energy intensity per square foot among commercial buildings in the United States. And although beef consumption has fallen, widely used foods like beef and dairy have particularly high emissions per pound. Jointly, that accounts for nearly half of the greenhouse gases attributable to different categories of food.

What's more, up to 40 percent of food grown in the United States today goes to waste, even though much of it is edible. Consumer preferences for cosmetically perfect fruits and vegetables and common contracting practices with growers, for instance, contribute to over-planting, farm fields that are left unharvested, and high cull rates on the farm. Wasted food contains enormous embedded carbon in its production, transportation, and processing. When dumped in a landfill, it also gives off significant amounts of methane, a particularly powerful greenhouse gas.

RECOMMENDATIONS:

Foodservice and culinary professionals can play a key role both in reducing greenhouse-gas emissions and supporting practices that will help our food and agricultural systems adapt to a changing future. These include purchasing from farmers who use agricultural practices that build soil fertility, conserve water, and reduce reliance on petrochemical-based inputs; reducing energy and water use in foodservice facilities; eliminating excess packaging; incorporating practices that reduce food waste by customers; buying from food sources that offer lower-carbon transportation and shorter periods of refrigeration in transit; and composting organic material. In designing menus, foodservice and culinary professionals should prioritize low-carbon foods such as flexitarian and Meatless Monday offerings to reduce the consumption of meat and dairy—a move that also advances health and wellness objectives while containing food costs. Adopting metrics to identify high-impact change strategies and track progress is also essential for procurement, menu design practices, energy and water use, food waste, packaging, and other actions that impact greenhouse-gas emissions and resource conservation.

SCORE: 2

Modest but insufficient progress to date on food waste reduction and increased plant-centric menu innovation, but global supply chains remain brittle.

HEALTHY FOOD VERSUS HEALTHCARE SPENDING

In 1960, the total annual U.S. expenditures for food were estimated at $74 billion. This was roughly three times as much as the total expenditures that same year of $27 billion for healthcare.

Fast forward to 2010 when Americans spent $1.25 trillion on food and more than $2.5 trillion on healthcare, a ratio of one to two. These sobering statistics document a 17-fold increase in food expenditures over the past half a century as compared with a 92-fold increase in healthcare expenditures over the same period of time.

These trends in health-related expenditures are considered unsustainable, as are the increasing rates of obesity, diabetes, and other diet- and lifestyle-related medical conditions.

One reason for this shift may be the decreasing amount of time Americans spend cooking today as compared with the time spent decades ago. Between 1965 and 1995, the amount of time Americans spent cooking decreased by 50 percent in the United States, across all demographic groups. Interestingly, though this could be more circumstantial than causative, each 30 minutes of reduced cooking time has been associated with an increase in Body Mass Index of 0.5. It is also notable, though not conclusive, that countries where individuals spend more time preparing their foods have lower rates of obesity. For example, Italian and French adults spend about 19 more minutes per day cooking than Americans and have far lower rates of obesity. By contrast, adults in the United Kingdom spend almost exactly the same amount of time cooking as Americans and have comparable rates of obesity.

Despite such trends, it is rare for medical and culinary and food industry experts to share notes, skills, questions, and ideas as to how the communities—each responsible for trillions of dollars of the U.S. economy—might partner to diminish rates of obesity, diabetes, and other diet-related health problems. But over the last several years, some interesting pilot programs have seen success. Cooking Matters, a program sponsored by anti-hunger organization Share Our Strength, taught 89,000 low-income people in 40 states how to shop smart and cook healthy food on a budget. The non-profit Wholesome Wave launched a Veggie Prescription program that allows doctors to give money to families struggling with diet-related disease to buy fresh fruits and vegetables at local farmers markets. Kaiser Permanente runs 50 farmers markets at its hospitals. These programs are exciting but they need to be ubiquitous. Integration of health care and culinary care will be realized only when there is a teaching kitchen in every doctor's office and hospital.

RECOMMENDATIONS:

Thought leaders representing the medical, public health, food industry, business, agricultural, and entrepreneurial communities should meet regularly to explore novel transdisciplinary strategies to combat obesity and other obesity-related diseases. They should work together, and combine their powerful influences on society, to teach families to cook and to develop other strategies to promote healthy, affordable, and delicious food.

SCORE: 2

Innovative programs are starting to link healthcare and healthy eating. But the connection is far from universal and more education is required.

THE CULINARY INSTITUTE OF AMERICA'S HEALTHY MENUS R&D COLLABORATIVE: WORKING TOGETHER TO EXPAND HEALTHY MENU OPTIONS

The Culinary Institute of America (CIA) has long been committed to bringing innovative, compelling healthy menu R&D solutions to the foodservice industry, including through its groundbreaking Worlds of Healthy Flavors leadership retreat (ciaprochef.com/wohf), held each January in collaboration with the Harvard School of Public Health (HSPH). Launched in 2004, Worlds of Healthy Flavors brings together leaders in nutrition science with leaders in volume foodservice (including culinary, nutrition, and marketing executives) to discuss and debate the best ways to expand the number of and consumer demand for healthy menu options in the United States.

In an effort to advance its support of healthy menu R&D, the CIA formed the Healthy Menus R&D Collaborative in January 2010. The multiyear initiative is focused on accelerating the development of highly targeted, sector-specific, practical solutions that significantly contribute towards expanding healthy menu choices within the foodservice industry.

The Collaborative has three co-chairs, from Compass Group, North America; Dunkin' Brands, Inc.; and Uno Chicago Grill. Members include representatives from Aramark, Au Bon Pain, Bertucci's, Black Angus, Brinker, Darden, Google, Harvard University Dining, HMS Host, IHOP, McDonald's, Panera, Ruby Tuesday, Sodexo, Subway, Whataburger, and Yale University Dining Services. Members collaborate during the annual member meetings held in January and June as well as through working groups that conduct online and conference-call meetings throughout the year.

The members have been working in two areas over the past three years: increasing the use of fruits and vegetables and decreasing the amounts of sodium on their menus. Progress in both areas has been impressive. Member companies report an average 18-percent reduction in sodium levels and an average 24-percent increase in produce usage across their menus between 2010 and 2012. Members will be focusing next on improving carbohydrate quality, including addressing the sticky issue of sugar-sweetened beverages.

For more information, please visit:
www.CIAHealthyMenus.org

"CURRENTLY, OVER 90 PERCENT OF AMERICAN FARMLAND IS PLANTED NOT WITH THE FRUITS AND VEGETABLES THAT CONSUMERS WANT AND NEED, BUT WITH COMMODITIES."

"89 percent of U.S. consumers say they are in some way engaged in sustainable living, from participating in a basic recycling program to cycling to work to buying local food."

- The Hartman Group

V: DEMOGRAPHICS AND CONSUMER PREFERENCES: ISSUES, TRENDS, AND CHANGING APPETITES

SUSTAINABILITY IS THE BUZZWORD OF THE NEW MILLENNIUM. BUT WHAT DOES IT MEAN TO CONSUMERS? AND HOW SHOULD CULINARY AND FOODSERVICE PROFESSIONALS DEFINE AND USE THE TERM TO REACH AND GROW THEIR TARGET MARKETS?

According to the consumer research company The Hartman Group, 89 percent of U.S. consumers say they are in some way engaged in sustainable living, which might mean anything from participating in a basic recycling program to cycling to work to buying local food and other products. Some make animal welfare a priority: A 2010 survey by Context Marketing found that 69 percent of consumers will pay more for "ethically produced" foods and 91 percent include animal welfare in that criteria. Others seek out local foods at farmers markets, grocery stores, and the restaurants they patronize. Hartman's 2010 Marketing Sustainability report found that 74 percent of consumers said that "use of local and seasonal foods" is important in choosing a restaurant as it suggests support for the local community, and an interest in reducing transportation costs, the health and well being of its guests, and high-quality products.

When talking about sustainability, marketers usually emphasize food's environmental, social, and economic impacts. But as Hartman points out, it is important for marketers to make the connection for consumers of how sustainable choices impact their lives directly. A snack might keep them healthy; a meal in a local restaurant might support jobs in the local community or raise money for a local PTA. "Literal definitions of sustainability are losing prominence," says Laurie Demeritt, the chief executive and president of The Hartman Group. "Some personal benefit must be served before larger sustainable concerns are considered by consumers."

Foodservice and restaurants are well positioned to become models of sustainability, especially when compared to traditional food and consumer packaged-good manufacturers, retailers, and vast corporate entities. Already, they have led the charge for local sourcing. The positive consumer response has made them more aware and open to incorporating sustainable practices into their business models.

This section provides insights and advice on how culinary professionals and foodservice businesses can navigate the tricky subjects of animal welfare and farm-to-table ingredients. It also surveys conflicting consumer attitudes and suggests ways that the sector, and chefs in particular, can encourage healthy choices.

ANIMAL WELFARE

Fifty years ago, the country and the planet had fewer people who ate less meat in smaller portions. The demand for meat, dairy, and eggs could be met by an agricultural system built of small farms and ranches practicing traditional animal husbandry with cows grazing on open ranges, pigs rooting through underbrush and wallowing in mud, and chickens scratching through pastures for grubs and bugs. Times have changed—dramatically.

More people now inhabit the country and the planet, and they are eating more meat, in larger portions, more frequently. About 99 percent of animals raised for food in the United States live in concentrated animal feeding operations. These so-called CAFOs do not include open range, underbrush, or pastures. Instead, they employ gestation crates, battery cages, debeaking, tail docking, runt thumping, dehorning, castration, detoeing, and maceration. Billions of animals live and sleep in their own waste.

Animal welfare has been a victim of the quest for high yields and efficiency. To produce more, more cheaply, animals are packed together without the ability to engage in natural behaviors, such as grazing, rooting, or scratching for food. They are also fed a steady diet of hormones and antibiotics, that help them to grow faster and bigger and to be slaughtered sooner. The resulting sea of cheap protein encourages people to eat more meat than is healthful.

The production of animal feed has transformed forests and farmland around the world. About half of all corn grown in the United States feeds animal, about four times more corn than is used in all other food products for humans, and much more than is converted for biofuels. And that feed must be transported to industrial animal facilities. The production of soybeans to meet global demand is also a leading contributor to the deforestation of the Amazon, surpassing cattle rearing itself.

Efforts to improve animal welfare are underway and growing. As of 2012, nine states have passed legislation to ban gestation crates that cage pregnant and nursing sows so tightly they cannot turn around. Some of the world's largest food companies—McDonald's, Burger King, Sodexo, Sysco, and others—also have announced that they will eliminate gestation crates from their supply chains. In addition, seven states have banned crates for calves, three states have banned tail docking for cattle, and, in 2008, California became the first state to ban the use of battery cages to house laying hens, where the standard amount of floor space per hen is roughly equivalent to an eight-and-a-half-by-eleven sheet of paper.

In April of 2012 the federal government issued new guidelines for foodservice and vending at government agencies that both mandated healthier meals with more fresh fruits and vegetables, as well as a recommendation to offer sustainably or locally produced eggs and meat from animals that are grass-fed, free-range, pasture-raised, grass-finished, and humanely raised and handled. New certifications being added to food labels now tout claims of Certified Humane, or Certified Pasture (although they currently remain largely unregulated). Some of these have been small initiatives with limited overall impact, but the trend is on the rise and therefore the full potential impact remains to be determined.

RECOMMENDATIONS:

The community of foodservice and culinary professionals are responsible for a large proportion of the demand for meat, dairy, and eggs and are in a position to promote profound improvements in the welfare of the animals raised for food. For the small but growing segment of customers who are committed to animal-welfare reform, chefs should offer certified products and a story about where they source their meat. For the mass market, foodservice and culinary professionals could redesign menus with a greater number of meatless options and reformulate recipes to use smaller amounts of meat, dairy, and eggs. A selective and informed approach to food sourcing and supply-chain management can help to support and sustain producers with superior animal-welfare practices. Negotiations with producers may lead some of them to transition to improved animal welfare practices. If successful, such efforts could make food professionals a driving force in restoring traditional animal husbandry, supporting small farms and ranches, and improving the state of animal welfare in the meat, dairy, and egg sectors.

SCORE: 3

Awareness is growing and important innovations are underway, but most meat still comes from industrial farms where conditions are not aligned with consumer ethics.

LOCAL FOODS AND THE FARM-TO-TABLE MOVEMENT

Since the culinary community introduced farm-to-table dining into the American marketplace in the 1980s, the concept has transformed the way we eat and the way we think about food. In a few brief decades, this culinary response to the loss of identity and flavor in the global food supply chain has raised the consciousness of consumers and changed their dining and purchasing habits.

In recent years, the farm-to-table ethos has evolved into today's vibrant local-foods movement, spreading from independent restaurants to grocery and high-volume foodservice operations. There is a national "Farm to School" effort to improve school foodservice operations. Across the country, vocal and engaged chefs have helped to boost schoolchildren's fruit and vegetable consumption.

Local foods are now firmly established in the mainstream as one of the most significant and fastest-growing food concepts, and are regularly featured on the National Restaurant Association's "Hot List" as well as top grocery retail trends.

Though there is no one official definition of "local food," studies have shown that consumers believe it to be superior in terms of quality and a key contributor to growing local economies and promoting animal welfare. This perception is driving sales of such foods, especially fruits and vegetables, which totaled almost $5 billion in 2008, the latest figure available.

The problem is, there just isn't enough locally produced food to meet demand, especially among large foodservice companies and organizations. The relative scarcity of local food is a result of long-time federal policies that favor industrial agriculture. Currently, over 90 percent of American farmland is planted not with the fruits and vegetables and other healthy crops that consumers want or need, but with commodities such as corn and soybeans that are primarily used as inputs to produce animal feed, processed foods, and non-food products.

The shift back to sourcing from small, nearby farms that grow food for flavor, rather than durability for shipping, has inspired culinary creativity and created a sense of place at the table, while increasing the dining public's awareness of seasonality and how food is grown. And, according to a host of recent studies, it has also done much more than that. Chefs' focus on buying from local farms is one of the main reasons that small farms still exist in the United States, though most are located near cities and chefs who are interested in local supplies. The quest for authentic local flavors also has increased the diversity of crops and livestock raised on small farms and preserved heirloom seeds and breeds.

Sourcing locally grown foods leads to many good things. But it's not an effective climate-change strategy. Environmental scientists and advocates have rightly pointed out that reducing the distance food is shipped farm to table—whether from 1,500 miles to 100 or 100 to 10—will reduce energy use and emissions from trucking. But comprehensive studies on greenhouse-gas emissions from producing food have shown that the majority of them come from on-farm practices. (Livestock generally produces higher emissions than crops.) Farmers' decisions whether to use synthetic fertilizers, pesticides, and mechanical irrigation, as well as how to manage soil, affect greenhouse-gas emissions more than transportation and storage. This is true even for fresh fruits and vegetables, where refrigerated transport and storage still account for no more than one-quarter of emissions, compared to nearly three times as much comes from farming practices. Choosing the "right" farms, as well as increasing the share of plant-based foods on the menu, both are more effective approaches for reducing greenhouse-gas emissions from the food system.

RECOMMENDATIONS:

Increasing the use of local foods depends heavily on companies' commitment to redesigning menus and hiring skilled professionals who can develop new dishes based on available ingredients. While it might be difficult, especially in some areas of the United States, to meet the rising demand for local food, culinary and foodservice industry professionals can take the first steps by working closely with progressive farmers and trusted intermediaries, including processors and distributors.

A number of companies already have been successful in developing sourcing strategies that require the use of a certain percentage of local produce on menus (often 20 percent to 30 percent to start). The results are appealing to their customers, who hear media messaging about local foods and want to make that part of their own purchasing and dining habits without necessarily changing the restaurants they patronize. It also encourages chefs to work with farmers to develop seasonal menus based on what the farmers can grow and to have farmers grow what the chefs want to use.

SCORE: 3

Increased sales of locally grown foods demonstrate progress, but the U.S. food system must dramatically change to meet population-wide health and sustainability imperatives and support consumer aspirations for more local and regional flavors.

CONSUMER ATTITUDES AND BEHAVIORS ABOUT HEALTHY AND SUSTAINABLE FOOD

Americans are aware of and care about healthy and sustainable food. A 2011 consumer survey by Datassential showed that 84 percent of consumers believe it is increasingly important for chain restaurants to offer menu items that are fresh, local, organic, and natural. Another survey conducted in September 2012 by HealthFocus International showed that more than 70 percent of respondents consider nutrition and health an important issue when eating in restaurants. One-third of respondents always make menu choices based on nutrition and health considerations.

But how much they care and how this translates into food choices is challenging to assess. There are many other powerful forces that influence behaviors, such as taste, cost, and convenience. In some cases, for some foods, these factors converge. In others, they are at odds with one another. Public confusion over the definitions of "healthy" and "sustainable" foods makes it difficult even for consumers who do care to make good choices. And surveys continue to show that consumers believe that foods that are locally or sustainably grown, including organic foods, are also healthier for them, which is not always true.

Meeting the needs of these consumers for a variety of healthy and sustainable menu options presents a big business opportunity for restaurants and other foodservice operations. The Hudson Institute and Robert Woods Johnson Foundation recently reported that it has become one of the fastest-growing areas of the foodservice industry.

At least three U.S. agencies are charged with helping to define what is "healthy." The Institute of Medicine sets guidelines for nutrients, which include protein, carbohydrates, fats, vitamins, and minerals. The United States Department of Agriculture translates those recommendations into food groups and foods. In the 1990s this took the form of the Food Pyramid, which evolved into MyPyramid.gov, and more recently into MyPlate.gov. The USDA also publishes and updates the Dietary Guidelines for Americans every five years. The Food and Drug Administration approves specific health claims ("diets low in sodium may reduce the risk of high blood pressure," for example), and defines the criteria for label claims (how low in fat a product would have to be to indicate it is "low-fat" or "reduced fat"). Other groups that provide nutrition recommendations include professional associations such as the American Heart Association and the American Cancer Society. All packaged foods in the United States include a Nutrition Fact Panel. The food industry, particularly for packaged and processed foods, adds another level of complexity with claims such as "natural," "zero net carbs," or "rich in antioxidants."

All in all, it is a lot of information. Making matters worse, Americans are often distracted by areas of emerging or unsettled science, or by media reports hyping poorly constructed studies. Their confusion is further compounded by the fact, discussed elsewhere in this report, that U.S. government dietary advice sometimes lags behind the leading edge of scientific research, or does not otherwise align with the preponderance of evidence linking diet and health outcomes (e.g., labeling around "low-fat" when in many instances this implied benefit is not supported by the science, as in the case of healthy fats and oils). Politics, too, slow the spread of good information. The Institute of Medicine recently issued two reports addressing front-of-package labeling, with the long-term objective of simplifying and standardizing the kinds of information that can and should be available on food packaging, and how to best present it. But no consensus has been reached yet, and any agreement may be some time in coming.

Consumers are also interested and befuddled by sustainable foods. The term "sustainable" can mean many things: that the food is not harmful to the environment or that it was produced in ways that promote biodiversity or ensure farmworkers are paid a fair wage, for example.

There are ongoing heated debates about whether crops that have been manipulated through genetics (known as "genetically modified organisms" or GMO) are sustainable. Last year, Californians voted on a proposition to label all foods that contain GMOs. Polls indicated the proposal had broad and strong support early before the election, but after large inputs of campaign funding to vote "no" on GMO labeling (funded by big food companies), it was defeated by a narrow margin. Now, grocers have taken action to enact voluntary labeling and bans on GMOs over the next few years. Meanwhile, the niche market for organic foods—which are GMO free—is relatively small, but currently growing faster than any other segment of the grocery store except for meals prepared by culinary professionals. And while there are national standards for what qualifies as organic, some food products barely meet the minimum requirements while others go above and beyond.

What is clear is that there is a notable and growing segment of Americans interested in healthy and sustainable food, driven by both long-term trends and the visible leadership of culinary professionals. Since 1994 the number of farmers markets has more than quadrupled to 7,864 in 2012. On restaurant menus around the country it is common to find menu items designated as heart healthy, low fat, vegetarian, or vegan as well as references to local farms from which meat or produce is sourced. So far the impact of health and sustainability trends on the average American's diet is modestly positive, with much of the change and innovation now coming in the foodservice industry and the influence of chefs on what people choose to cook and eat at home.

RECOMMENDATIONS:

Foodservice and culinary professionals should be prepared to serve the growing segment of diners who care about health and environmental sustainability while recognizing that only some of them make food choices that reflect these values. Foodservice professionals should also take a more proactive role of guiding and promoting healthier and more sustainable eating habits and helping diners to understand how the two intersect on the plate. To succeed, culinary professionals must better understand how and why the terms "healthy" and "sustainable" are so confusing, and try to use them honestly, rather than carelessly and inaccurately to promote sales.

SCORE: 3

Consumers remain confused by basic definitions of "healthy" and "sustainable." Consumers need to understand that choosing better ingredients is only a partial solution, along with changes to what and how much to eat.

CHEFS' INFLUENCE ON CONSUMER ATTITUDES

In September 2012, more than 100 members of the newly formed American Chef Corps gathered at the U.S. Department of State headquarters in Washington, D.C., to be anointed "culinary ambassadors" of the United States. In a video statement, Secretary of State Hilary Clinton told the crowd at the reception that sharing a meal was the oldest form of diplomacy and that these chefs would play an important role in the country's "soft power" strategy to influence international relations.

Chefs are increasingly in the spotlight and as political, environmental, and public-health issues related to food become ever-more important among the general population. Many are finding themselves in leadership roles in food-system change. Are chefs willing and able to accept these new responsibilities? Do diners really care?

In the fall of both 2011 and 2012, the James Beard Foundation surveyed chefs about their views regarding sustainability, their customers' attitudes about the environment and nutrition, their personal and professional shopping and eating behaviors, and their perceived role as influencers in food-system change. Though only a snapshot, the data reveals that chefs believe they have both the responsibility and influence to affect food-system change. Of those who answered the question in the 2011 survey, 66 percent said they agreed or strongly agreed with the statement "Chefs are at the forefront of food-system change." When asked, the following year, "Who has the most responsibility to create the change in the food system you want to see?" more than 82 percent said chefs had the most responsibility—more than policymakers or trade organizations.

Interestingly, the data suggest that diners are not yet on board with valuing this perceived leadership role.

In the 2012 survey, only 10 percent of the chef respondents believed their attention to environmental sustainability issues was "very important" when customers were choosing where to eat. Perceptions of food quality and food safety were considered the most important factors that influenced customers' restaurant choices. For this information, they looked for good reviews and previous experience with the chef or restaurant. This disconnect is also apparent in the National Restaurant Association's What's Hot 2013 Chef Survey: Five of the top 10 trends for the year according to chefs include the words "local" or "sustainable," referring for example to "locally sourced meat and seafood" (no. 1), "locally grown produce" (no. 2), and "environmental sustainability" (no. 4).

Organizations, including the CIA, the James Beard Foundation, and Chefs Collaborative, have recognized these changes and worked to provide support for chefs interests in health, environmental, and other issues of social responsibility. To establish credibility, however, chefs must be cautious about whatever positions they stake out on food issues. (Celebrity chef Paula Deen learned this the hard way in 2012 when she was called out publicly for her endorsement of high-fat, high-sugar recipes and products while keeping secret for several years her diagnosis of diabetes.) At the Beard Foundation's 2011 conference, José Andrés warned chefs not to be too quick to condemn global food companies for their carbon footprint. "I watch how a fast-food restaurant receives his food. And they sometimes get one shipment a week. If we are talking about the environment, I cannot be criticizing the others without first being very, very, very pragmatic with myself. I am part of the problem…when actually I am receiving between 15 and 20 shipments of local food a day."

RECOMMENDATIONS:

Not all chefs are interested in pursuing these larger societal roles and responsibilities yet, and they may never be. As small business owners and operators, their primary focus is often on sustaining their livelihoods and those of the people whom they employ. What's more, food-system issues will never resonate with all diners. Many chefs have been strong advocates of local-food systems and sustainable-food systems, but not as engaged when it comes to including healthier food choices on their menus.

Animal proteins, even if humanely raised heritage breeds, served in large quantities, have reigned atop fine-dining menus for several years. Meanwhile, high-volume operators have made significant improvements in their healthful food offerings, but not always paid enough attention to sustainable production practices.

Clearly, chefs must work harder at changing diners' attitudes so that environmental sustainability issues and healthful foods become more than a 10-percent factor in consumers' dining-out decisions. Better alignment between chef and consumer choices is needed, including redefining what indulgence means at the table; often, and particularly when eating out to celebrate a special occasion, diners do not want to have the impression they are sacrificing taste or not getting the best value for their meal. The chef becomes crucial in aligning health, sustainability, flavor—and value—by preparing menus that don't sacrifice either of those elements.

Chefs should proactively reduce animal-protein (especially red meat) portions to between two and four ounces for many main courses, for example, and devote more of their creativity to vegetable proteins (e.g., legumes and nuts, as well as products made from these). Vegetables also have recently gained more appreciation as a creative outlet for chefs, and offer great potential to further push healthier main-course options. Chefs should communicate a message of pleasure that is not just equated to animal meat and fat. They can use their media reach to bridge the gap between what they perceive as trends and priorities, and to offer a message that will then be reflected in diners' choices when at their restaurants. High-volume operations should use their extensive reach among the dining public to similarly promote a message that includes sustainability priorities, and they should reflect them in their purchasing practices.

SCORE: 4

Chefs are very engaged in the movement for sustainability. But there needs to be additional focus on portion size, nutrition, and public health.

VI: BUSINESS IMPERATIVES: THE CHANGING CALCULUS ON COSTS, RISKS, AND OPPORTUNITIES

IT WOULD BE HARD TO PICK A YEAR WHEN COSTS, RISKS, AND OPPORTUNITIES FOR THE FOOD INDUSTRY HAVEN'T BEEN IN FLUX. BUT RECENTLY, THESE SWINGS HAVE BEEN MORE DRAMATIC AND MORE FREQUENT. NAVIGATING SUCCESSFULLY THROUGH THESE CHALLENGES REQUIRES MORE CREATIVITY, SKILL, AND SAVVY THAN EVER BEFORE.

Over the past several years, a higher number of severe storms and droughts has affected crops and pushed up food costs. Consumers' shifting tastes have surprised the industry, as has their interest in where their food comes from. The prospect of significant new nutrition regulations keeps appearing on the horizon, and then fades away. This era of change—big, frequent, and unpredictable—has complicated the fundamentals of the foodservice business: designing menus, managing costs, and satisfying the dining public.

Success in a time of rapid change and unprecedented circumstances has itself become a risk for food companies—as well an opportunity. Food companies are responding with innovative business models and menu concepts, with many focused on healthy, sustainable food. The menus of both large and small restaurants and foodservice operations are changing to include more dishes made with plant-based proteins and poultry and less red meat; fruits and vegetables are often featured as prominently as other types of ingredients. Healthy, sustainable restaurant concepts now are among some of the biggest new business launches and at the center of a wave of venture-capital investment that has grown seven fold since 2008.

Larger, established food companies also are looking to adopt new ways of doing business, despite fears in the executive suites that changing fundamental business practices and popular brands is risky. For the first time in many years, they are looking to spend much more on innovation and business transformation. Improving information technology is a top investment priority, along with more partnerships and acquisitions of small, fast-growing companies that have new concepts and ways of doing business.

Innovation also is accelerating in the financial community, and that is fueling the sector's growth. Financial analysts now rate companies on their ability to offer transparency in their supply chains and, in some cases, their plans to provide healthy, sustainable, and responsibly-produced foods. Moving forward, delivering on health and sustainability increasingly will be linked to delivering results to shareholders.

Investing in technology, especially for supply-chain transparency, has the real potential to provide returns. The ability to track food from farm to fork allows chefs and food companies to let consumers know more about where their food comes from, support good agricultural practices, and avoid producers with poor labor practices and the surprises and costs that come from them. Indeed companies with sophisticated supply-chain technology may have fared better over the past year as food costs swung up and down as quickly as the weather forecasts changed. They also were more likely to have avoided issues, such as the horsemeat-contamination scandal, which drove up costs and eroded public confidence.

The one area where progress has been disappointingly slow is in the area of public policy. Chefs have worked hard to advocate for new and better standards, especially in school meals. But Congress has been slow to act while the food industry's lobby has been effective at maintaining the status quo rather than promoting change.

In preparing to navigate the year ahead, the guiding stars are fewer and yet brighter. Supply-chain transparency, investment strategy, and innovation are now connected to health and global sustainability issues. The pace of innovation is picking up, along with the investment to fuel it. Perhaps the biggest risk is not moving quickly enough.

SUPPLY CHAIN TRANSPARENCY AND RESILIENCY

The global food chain is efficient but complex. As a result, food buyers, including chefs, procurement teams, and consumers, cannot easily identify where their food comes from and are not always sure what they are getting. Producers also suffer because they cannot guarantee a predictable and reliable stream of products. The system has successfully kept food cheap, but signs of strain are beginning to show.

Over the past year, there have been more frequent instances of severe weather and drought than normal, which have made harvests uncertain and yields more difficult to forecast. U.S. consumers experienced relatively modest food inflation, but the cost increases were still felt, especially by families on tight budgets. Food companies, their supply chain partners, and farmers experienced a series of unexpected costs—and occasional windfalls.

Globally, the impacts of rising costs and uncertain harvests were significant; some countries found themselves without access to reliable and affordable supplies of traditional and nutritional foods. In foodservice, increased volatility is becoming the new normal.

This ability to hold on, if not adapt, was overshadowed by a series of crises. For example, in 2011, German authorities blamed Spanish cucumbers for a deadly E. coli outbreak and shortly extended warnings on all raw vegetables from Spain, sparking panic across Europe. Sales of salad vegetables plummeted in the region in response to the accusations. This year, the opaqueness of the supply chain again plagued the European food sector as one company after another found horsemeat present in foods they believed were made from beef. In the United States, consumers learned that more than 30 percent of the fish for sale were mislabeled, often as less popular and inexpensive variety or, in some cases, pig parts.

While U.S. consumers were characteristically more tolerant, the problems reveal how little the supply chain has changed over the last decade.

(In a particularly infamous case, traces of genetically modified corn, called StarLink, which was not approved to enter the human food supply, was found in Taco Bell taco shells and other food products in 2000. The discovery led to huge recalls of food and considerable economic losses.) Increasing transparency and resiliency in the supply chain is essential to building trust and maintaining profitability as well as ensuring that food is produced safely and sustainably.

To date, the most effective strategy to instill trust in the supply chain has been food labels with clear definitions and, for some, third-party inspection. Organic, in particular, has been an undisputed success. More than 78 percent of U.S. families buy some organic food; this, despite the fact that organic products cost as much as twice the price of uncertified products. Consumers' willingness to pay a premium suggests that food buyers are attentive to labels—and there are economic rewards for companies that adhere to standards that promote social and environmental sustainability.

Unfortunately, many new food labels lack the transparency of the term "organic." "Local" has come to represent for many an adherence to eco-friendly practices. But there is no agreed-upon definition, and some foodservice professionals and food marketers have used the term disingenuously. Seafood labeling, a clear trouble spot, risks breeding consumer distrust in all labels and certifications.

RECOMMENDATIONS:

The top priority for foodservice industry and culinary professionals knowing where food is sourced, how it is grown, and which businesses have handled it on the way to the kitchen. Only then is it possible to manage cost and risk and promote more sustainable production. The recent Department of Agriculture traceability guidelines will help efforts to connect farmers and consumers. The movement to mobile data collection, the use of smartphones to verify shipments, and RFID chips to track shipments allow a whole new level of measurement and precision to trace food from farm to fork.

SCORE: 2

Supply chains remain opaque with serious consequences, including a growing consumer suspicion that some foods are not safe.

INNOVATIONS IN THE FOOD INDUSTRY

Early-stage growth businesses that promote health and sustainability are increasingly attracting attention and investment from venture-capital and private-equity investors. Food, which sits at the intersection of these two sectors, is drawing special interest. The characteristics of the traditional packaged-food industry, however, where building brands takes years or decades and achieving scale can require millions of dollars in capital investment, does not fit conventional venture-capital models that depend upon proprietary technologies and rapid, capital-efficient business models that scale quickly.

Some venture-capital investors have focused on media and food products. In the last year, Silicon Valley venture-capital firms have channeled about $350 million into food projects, a seven-fold increase over 2008, according to research firm CB Insights. Yummly, a searchable recipe hub, for example, attracted investment from high-profile investors including Physic Ventures, First Round Capital, and Unilever's corporate venture fund. Beyond Meat, a plant protein that mimics the texture of chicken, is backed by the Silicon Valley firm Kleiner, Perkins, Caufield, and Byer. Large food manufacturers, too, have become more adept at recognizing promising innovations and have developed effective partnering strategies to accelerate scale and mitigate risks. Several now work with early-stage companies and obtain rights to acquire them as they scale up. In 2012, General Mills bought Food Should Taste Good, a natural snack company. In 2011, Coca-Cola bought Honest Tea, a beverage brand that stresses health and sustainability.

Luring investors to start-ups in agriculture has been a tougher sell. The sector is highly regulated and political, a turn-off to investors who are used to investing in sectors such as high-technology or pharmaceuticals. And there is no obvious exit strategy for many firms. The big agriculture firms do most development in-house and do not often acquire smaller companies to solve technology or sustainability problems. The most notable movements on the supply side are long-term investments in farmland. These investments appear to be safer places to preserve assets or grow them over 15, 20, or 30 years. Traditional venture capital has only a five- or 10-year horizon.

RECOMMENDATIONS:

Successful and investable innovations derive from diverse teams of experts who bring varying skills to a start-up. For example, a chef might team with a packaged-foods executive or a foodservice distribution expert might work with social-media professionals. Similarly, there will be new information-based businesses that will help to simplify food sourcing, procurement, and distribution. Culinary professionals with knowledge of menu design, sourcing, and foodservice have valuable skill sets that will augment entrepreneurial management teams seeking to build new businesses.

SCORE: 3

There is much experimentation, but dynamics that propel active capital investments are still new and evolving.

CHANGES IN INVESTMENT STANDARDS

Investors increasingly consider a company's sustainability profile, in addition to its financial standing. This trend aligns with a subset of investors who incorporate environmental, social, and governance (ESG) factors into company valuations: A 2012 study found that $3.74 trillion were invested in responsible and sustainable investments by U.S. firms, an amount equal to the gross national products of Canada and Brazil combined.

Product safety tops the list for investor concerns, especially given the potential short-term financial losses from recalls or pathogen outbreaks. Investors also focus heavily on health and wellness concerns, particularly with respect to a company's ability to capture market share, build reputation, avoid regulatory risk, drive innovation, and respond to consumer interest in health, weight control, and clean labels. At the same time, savvy investors are able to recognize overstated health claims that risk brand erosion for short-term gain. True innovation should drive long-term growth, ideally changing ingredients or methods of production or distribution that fundamentally transform the final product or service.

One area where mainstream investors differ from those with a sustainability focus is how foods are marketed to children; ESG investors see aggressive marketing of unhealthful food to children as a long-term brand risk, while many mainstream investors see this practice as strategic.

Investors also understand how sound environmental management can translate to a better bottom line for food companies, particularly in an age of resource constraints, plummeting biodiversity, and climate change. Operational efficiencies—such as energy, packaging, and water-use reductions—are the low-hanging fruit for many restaurants and food companies to achieve savings. The greatest environmental impact, however, lies in agricultural production. Investors focus on the entwined impacts of climate and water scarcity, whether companies have mapped that risk, and how they plan to adapt to current conditions (such as the U.S. drought) and predicted changes.

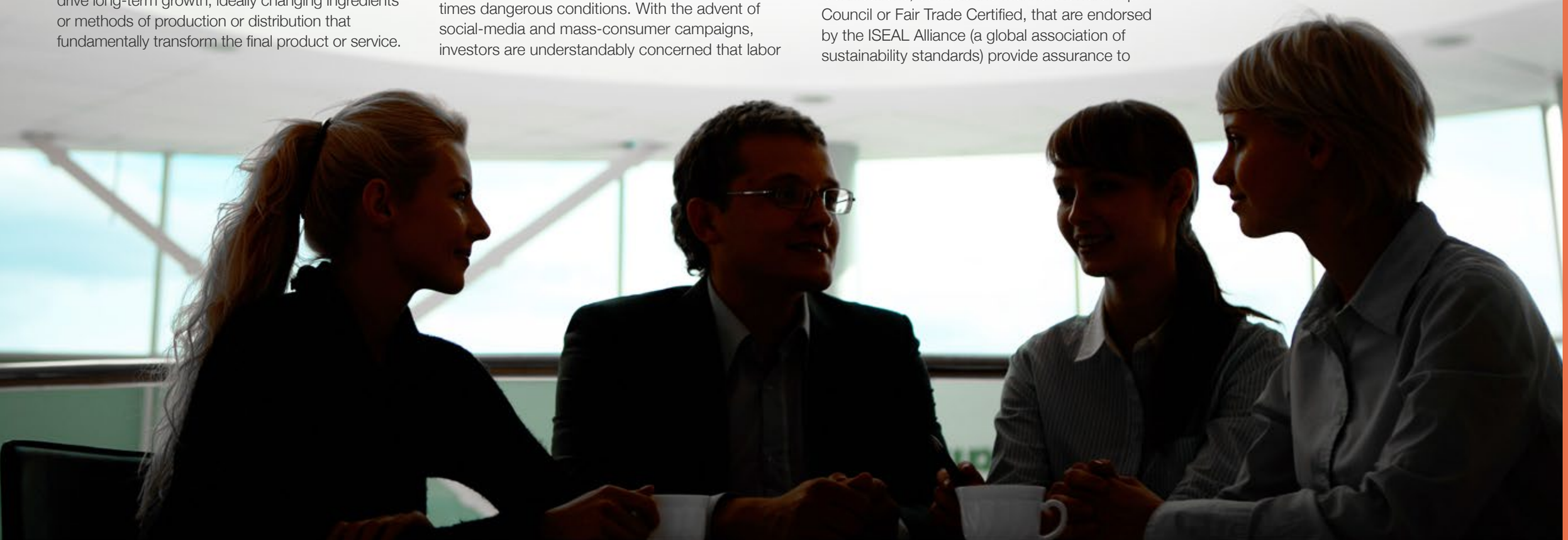
Food production and service is labor intensive, and investors do care about how employees are treated and engaged. Deep or poorly administered layoffs can lead to product safety or quality problems. Low morale or sexual harassment can translate into talent and brand-value loss. Vulnerable workers, such as migrant, undocumented, or child laborers, often perform agricultural work in difficult and at times dangerous conditions. With the advent of social-media and mass-consumer campaigns, investors are understandably concerned that labor problems within the company or its supply chain could undermine company profitability or growth. Anticipating and responding to sustainability challenges and opportunities are now important across the industry, from smaller restaurants seeking private investment to large-scale foodservice operations or manufacturers that are publicly traded on stock markets.

RECOMMENDATIONS:

There are clear steps a chef, restaurateur, operator, or food company executive can take to assure investors that ESG concerns are being managed well. First, good governance and transparency are the building blocks of investor trust. Providing clear information about governance structure, practices, and sustainability efforts are key. Second, food company managers should conduct an assessment of their sustainability risks and opportunities—developing a plan for addressing the most significant issues and communicating the plan to investors and other stakeholders. Third, chefs and food scientists should develop healthful, delicious foods without resorting to gimmicks or shady marketing practices, and should steer consumers to healthful choices by making them more visible or accessible. Food companies can work collaboratively on "pre-competitive" issues—those that affect the entire industry and are best grappled with together. Certifications, such as the Marine Stewardship Council or Fair Trade Certified, that are endorsed by the ISEAL Alliance (a global association of sustainability standards) provide assurance to investors that companies are taking ESG risks seriously. All companies should disclose their labor standards and policies, and large companies should include robust labor standards in their company and supplier codes of conduct, as well as details on auditing and improving how standards are met. Overall, chefs, restaurants, and food or beverage companies will need to remain nimble, engaged, and informed about sustainability issues in order to satisfy investor concerns.

SCORE: 3

Food companies have made improvements in defining and disclosing sustainability challenges and opportunities. Investors still see significant risk, particularly with regard to resource constraints.



> “Supply-chain transparency, investment strategy, and innovation are now connected to health and global sustainability issues. The pace of innovation is picking up, along with the investment to fuel it.”

VIII. PRINCIPLES OF HEALTHY, SUSTAINABLE MENUS: EXECUTIVE SUMMARY

THE PRINCIPLES OF HEALTHY, SUSTAINABLE MENUS, AN OUTGROWTH OF THE MENUS OF CHANGE™ LEADERSHIP INITIATIVE CO-PRESENTED BY THE CULINARY INSTITUTE OF AMERICA (CIA) AND HARVARD SCHOOL OF PUBLIC HEALTH (HSPH) DEPARTMENT OF NUTRITION, REPRESENT UNIQUE GUIDANCE FOR THE FOODSERVICE INDUSTRY. THEY INCORPORATE FINDINGS FROM NUTRITION AND ENVIRONMENTAL SCIENCE PERSPECTIVES ON OPTIMAL FOOD CHOICES, TRENDS IN CONSUMER PREFERENCES, AND IMPACTS OF PROJECTED DEMOGRAPHIC SHIFTS IN ORDER TO PROVIDE CULINARY INSIGHT AND MENU STRATEGIES THAT BUILD ON PROMISING INNOVATION ALREADY OCCURRING IN THE SECTOR.

The principles anticipate that fast-moving, mid- and long-term global trends will increasingly reframe how we think about food and foodservice in the United States. They also consider that the rise in diet-related chronic diseases suggests that many of today’s food and foodservice business models cannot hold unchanged for the long term. The principles outline pivotal culinary strategies designed to increase the odds that customers will reward pioneering and innovative restaurants and other industry operations with their business.

In short, the Menus of Change Principles offer a guide to optimal menu design and innovations for future culinary development to promote the foodservice industry’s abundant creativity and entrepreneurial dynamism in support of a future of tremendous opportunity.

What follows is an executive summary version of the Menus of Change Principles, which you will find in full on page 44.

THE PRINCIPLES

MENU CONCEPTS AND GENERAL OPERATIONS

1. Be Transparent. Let customers know how your food was produced, including information on labor, animal welfare, and environmental practices. Inform your customers about calories and nutrition.

2. Fresh and Seasonal, both Local and Global. Source fresh, peak-of-season foods from farms that use more sustainable growing practices, including local producers and those in more distant regions.

3. Reward Better Agricultural Practices. Shift purchases to farms and ranches that protect and restore natural systems and reduce greenhouse gas emissions through effective management practices.

4. Globally Inspired, Largely Plant-Based Cooking. Increase the ratio of plant-centric foods and preparations to those from animal sources, leveraging flavor strategies of traditional food cultures around the world to support menu innovation.

5. Focus on Whole, Minimally Processed Foods. Emphasize slow metabolizing calories, and leave room for healthy processed foods—from frozen vegetables to low-sodium tomato paste and canned beans.

6. Grow Everyday Options, While Honoring Special Occasion Traditions. Expand everyday food and menu choices that embrace current nutrition and environmental science.

7. Promote Health and Sustainability Through Inspiring Menus. Lead with messages about flavor, rather than actively marketing health attributes.

8. Right Size Portions. Reduce portion sizes without undercutting profits by changing the value proposition for customers from an emphasis on quantity to a focus on flavor, culinary adventure, new menu formats, and the overall dining experience.

9. Celebrate Cultural Diversity. Savor our culinary heritage while reimagining those elements of culturally-based food traditions that may be less healthy by limiting portion size, rebalancing ingredient proportions, or offering these foods less often.

10. Design Operations for the Future. Create kitchens that support the optimal, environmentally friendly preparation of fresh, healthy foods, and eating spaces that lead consumers towards healthy, sustainable choices.

FOODS AND INGREDIENTS

1. Think Produce First. Focus on fruits and vegetables first—with great diversity across all meals and snacks.

2. Make Whole, "Intact" Grains the New Norm. Choose 100 percent whole-grain bread, brown rice, and whole grain and/or higher protein pasta.

3. Potatoes: New Directions for Sides. Limit your use of potatoes as a "plate filler" by combining smaller portions of them with other, non-starchy vegetables, featuring them less often, and offering healthier vegetables instead.

4. Move Nuts and Legumes to the Center of the Plate. Nuts and legumes are an excellent source of protein. They also add flavor and increase satiety.

5. Choose Healthier Oils. Fats high in unsaturated fats, such as canola, soy, peanut, and olive oils, as well as fish, nuts, seeds, avocados, and whole grains, are heart healthy. Avoid trans fats.

6. End the Low-fat Myth. Use beneficial fats, associated with optimal nutrition and healthy weight, to increase the appeal of other healthy ingredients such as vegetables and whole grains.

7. Serve More Kinds of Seafood More Often. Introduce diners to a wider variety of seafood sourced from responsibly managed fisheries.

8. Milk, Cheese, and Yogurt in a Supporting Role. Limit servings of dairy to one to two per day, leverage the flavor of cheese in smaller amounts, minimize the use of butter, and highlight yogurt (with no added sugar) as a choice in professional kitchens.

9. Poultry and Eggs in Moderation. Both are good choices of healthier protein with a far lower environmental footprint than red meat.

10. Red Meat: Smaller Portions, Less Frequently. Feature red meat in a supporting role to healthier plant-based choices, and also experiment with red meat as a condiment.

11. Reduce Added Sugar. Turn to ingredients like fruits, whole grains, dark chocolate, nuts, and healthy oils as alternatives in desserts, and substantially reduce sugar across the menu.

12. Cut the Salt. Stop relying on salt to deliver flavor. Instead use high-flavor produce, spices, herbs, citrus and other aromatics, healthy sauces, and seasonings.

13. Reduce Sugary Beverages and Innovate. Offer smaller servings, discourage frequent consumption, and promote the products of emerging and established brands that are developing solutions in this challenging area.

14. Drink Healthy. Serve water (plain, with fruit, herbs and aromatics, or other natural flavors), plain coffee and tea, and wines, beers, and spirits (in moderation, and with caveats).

VIII. CULINARY INSIGHT: VOICES OF CHEFS AND OPERATORS

"We have been working on relationships with our farmers for 26 years. When we first opened Frontera Grill I couldn't find any local strawberries; I couldn't believe it. I had to seek out local sources and communicate to our customers that what they were getting—small, gorgeous, amazing strawberries—was a limited special supply! Cooking seasonally is how we as a restaurant address healthier and sustainable food choices. We celebrate our local agriculture and support our farmers any way we can."

– Rick Bayless, Chef-Owner, Topolobampo, Frontera Grill, XOCO; Chicago, IL

"The premise of my restaurant is to source our ingredients from local farms and sustainable sources, which we accomplish through a few strategic partnerships that allow us to extend our networks to farmers, fishermen, and artisan producers with whom we might not otherwise connect. Locally, we partner with the Appalachian Sustainable Agriculture Project. On a national level, we are a direct restaurant partner of the Monterey Bay Aquarium's Seafood Watch. We work with their resources to promote and advocate the use of sustainable seafood to ensure the health of our oceans, streams, and rivers. These strategic partnerships enable us to create our menus with high-quality ingredients that are produced and harvested by people who care about them. It's how we close the cycle of our local food system and optimize our supply chain with healthy, sustainably produced food for The Market Place."

– William S. Dissen '03, Chef-Owner, The Market Place Restaurant; Asheville, NC

As part of Menus of Change, we wanted to make sure that the voices of those in charge of feeding America every day, from the skies to the schools, were part of the conversation and could share on a broad scale their thoughts on the value and challenges attached to sustainable food choices. In April, the CIA posted a survey titled Five Questions About the Future of Our Industry. The call was heard far and wide, and nearly 200 people answered these five questions. Coming from 36 states, respondents represented all sectors of the food industry, including fine dining, casual dining, education, catering, school foodservice, manufacturing, senior and special care, from chef-owned restaurants to international multi-unit operations.

Here are these questions, with just a few of the answers we received. More will be featured in the coming months at **menusofchange.org**, as the conversation continues.

1. HOW ARE YOU ADDRESSING HEALTHIER AND SUSTAINABLE FOOD CHOICES IN YOUR RESTAURANT(S) AND ON YOUR MENUS?

A majority of the respondents are sourcing more and more ingredients locally and working with farmers and producers to guarantee quality ingredients that align with their values and that of their customers.

"We have made a Wellness Pledge to our customers that our menus will offer 40 percent of all items that coincide with our wellness definition. This percentage will increase incrementally to 60 percent over the next 3 years. Sustainable targets and goals are addressed outside of our wellness goals."
—**Curt Seidl**, Morrison, a non-commercial multi-unit in the healthcare industry with 900 locations

"Understanding where my produce comes from is extremely important in terms of sustainability. Understanding portion size and providing more seasonal veggies on the plate and smaller protein portion sizes creates a healthier plate without leaving the diner feeling hungry or cheated."
—**Michael Mullins**, private chef; San Francisco, CA

"If a buffet or serving line, converting those slow lines or buffets into fresh, healthy options. For build-your-own salad/deli sandwich bar, a sandwich is basically built, and the client can add-on spinach, caramelized onions, power greens, etc. The same for their salads, from olives to hard-boiled eggs to smoked turkey or ham, etc."
—**Mario R. Perez**, Executive Chef, Chartwell's; New Braunfels, TX

"Our focus on making great tasting food with more sustainably raised ingredients available and affordable for everyone is one of the keys to our success. Better quality ingredients allow us to make better tasting food, and that's what keeps our customers coming back. While some of our customers don't know the depths of our commitment to finding such great ingredients, our discipline of focusing on making food this way has contributed significantly to our growth."
—**Peter Gebauer**, Potawatomi Bingo Casino; Milwaukee, WI

2. WHAT SUCCESSES AND CHALLENGES ARE YOU HAVING WHEN DOING THAT?

Cost, availability, and consumers' interest are the biggest challenges respondents have faced so far when trying to introduce healthier and more sustainable options on their menus. Getting local farmers to supply enough of an item, and do so consistently, is challenging for larger and multi-unit operations.

"Success has translated to good customer service metrics; challenges include high cost for these items."
—**Dickson Alvarado**, Gate Gourmet Airline Catering, a global company; Honolulu, HI

"Increased movement of higher end product that are escalating my food cost mix. But over all it is received well and provides for a diverse overall costumer satisfaction."
—**Yianni Spanoudakis**, The Olive Tree Restaurant, a three-unit casual fine dining operation; Lithia Spring/ Hiram/Villa Rica, GA

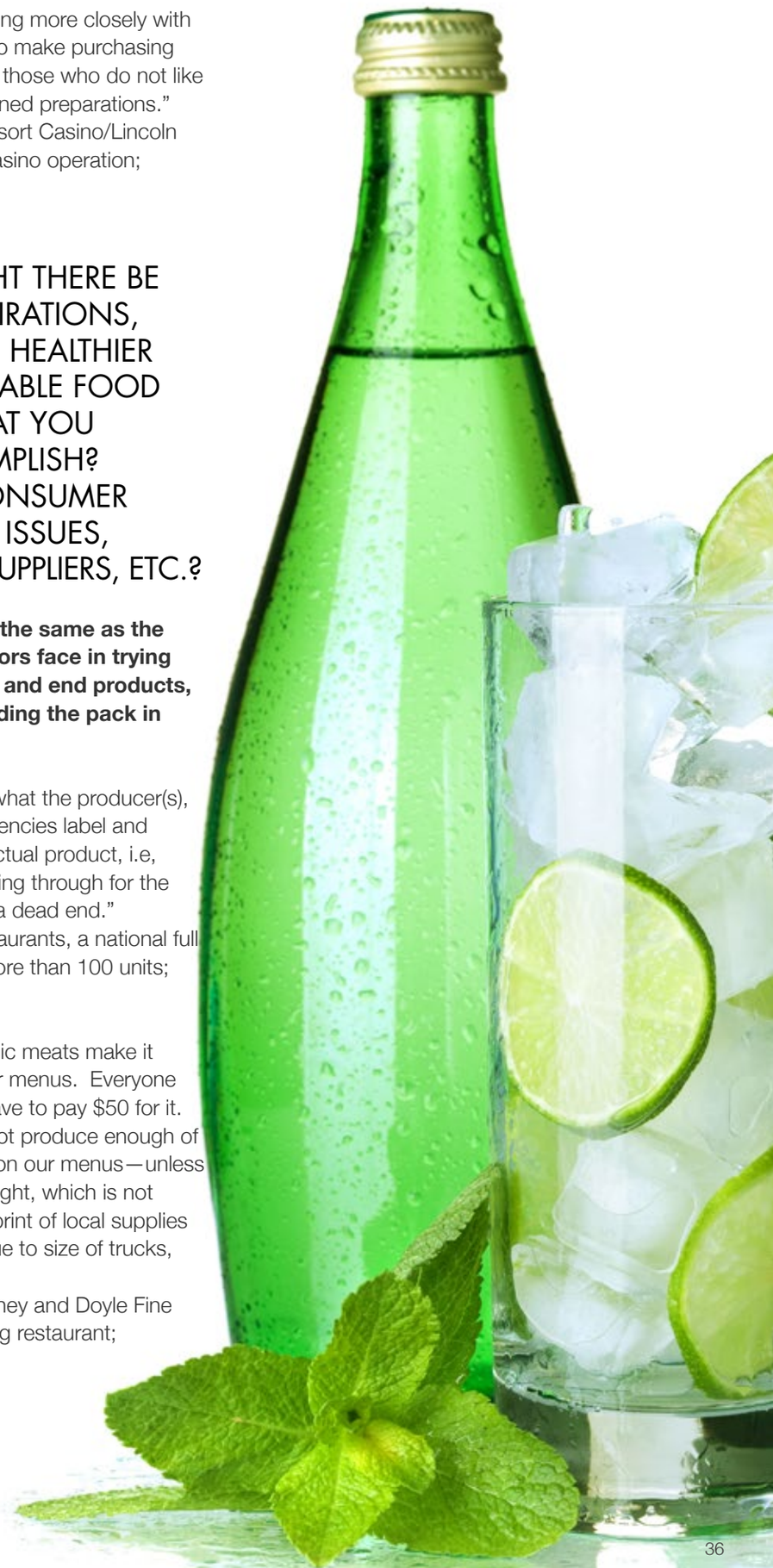
"Success: distributors are working more closely with local farmers/growers in order to make purchasing and delivery easier. Challenges: those who do not like change and want the old fashioned preparations."
—**David P. Brai**, Foxwoods Resort Casino/Lincoln Culinary Institute, a multi-unit casino operation; Mashantucket, CT

3. WHAT GAPS MIGHT THERE BE BETWEEN YOUR ASPIRATIONS, WHEN IT COMES TO HEALTHIER AND MORE SUSTAINABLE FOOD CHOICES, AND WHAT YOU ARE ABLE TO ACCOMPLISH? FOR EXAMPLE, IN CONSUMER ACCEPTANCE, COST ISSUES, IDENTIFICATION OF SUPPLIERS, ETC.?

Unsurprisingly, the gaps are the same as the challenges chefs and operators face in trying to change their supply chain and end products, with cost and availability leading the pack in their answers.

"There is a huge gap between what the producer(s), their PACs, and government agencies label and approve and the reality of the actual product, i.e, cage-free, free-range, etc. Digging through for the truth is daunting and inevitably a dead end."
—**Kevin Hall**, First Watch Restaurants, a national full service restaurant chain with more than 100 units; Sarasota, FL

"1. Costs. Prices for local organic meats make it almost impossible to use on our menus. Everyone wants a local steak until they have to pay $50 for it. 2. Supplies. Local farmers do not produce enough of any one item to be able to use on our menus—unless we change menu items every night, which is not practical. Also the carbon footprint of local supplies is often more than non-local, due to size of trucks, quantity hauled, etc."
—**Shannon Mckinney**, McKinney and Doyle Fine Foods, a chef-owned, fine dining restaurant; Pawling, NY



4. HOW SHOULD OUR INDUSTRY AS A WHOLE (INDEPENDENT AND MULTI-UNIT, SMALL-SCALE AND HIGH-VOLUME, CASUAL AND FINE DINING OPERATIONS, ETC.) WORK TOGETHER TO FEATURE HEALTHIER AND MORE SUSTAINABLE FOOD CHOICES?

Education is the key word here, along with the need for the industry to work together. Respondents feel that educating consumers, producers, distributors, and the industry as a whole is what will allow for more sustainable and healthier food choices.

"Help local communities grow fruit and vegetables, in a green house, hydroponically or in beds in park, schools and prisons and then purchase from them."
—**Sue Miller**, Café Lylla, a chef-owned 60-seat restaurant; Nashville, TN

"Simple... care about what you serve, not just the bottom line. And if it is less than healthy, make it be a small, small, small part of the plate. A fried garnish; not a fried entrée."
—**Rich Turnbull**, Oregon State University, with 17 restaurants, a grocery, and a catering operation; Corvallis, OR

"Collectively, we need to redefine the definition of wholesome food products and stand together as an industry to positively impact legislation, particularly in labeling, food subsidies, and GMOs."
—**Kathy Hawkins**, Rolling HIlls Place Senior Living/ Health Care; Zion, IL

"I think one item that needs to be addressed is also portion size, so that the industry is on the same page and consumers look for quality for their value and not always quantity."
—**André Nowading**, Kroger, Knoxville, TN

5. HOW DO YOU ENVISION HEALTHIER AND MORE SUSTAINABLE FOOD CHOICES PLAYING OUT ON YOUR MENUS IN THREE TO FIVE YEARS?

Most respondents see their healthier and more sustainable offerings increase within the next five years, with some questioning if this is a trend or here to stay.

"If it starts at the bottom level of service (QSR), and they maintain a certain standard, all other categories of full service will have to step it up to be relevant and competitive."
—**Industry consultant** from Florida

"As the availability of these products becomes more mainstream and the supply side of the industry develops more avenues for product and realistic pricing, more and more of these products will find their way on to my menus. We have primed the well, so to speak, by asking for the products and suppliers have found ways to make money selling them so the prognosis is good and getting better. With luck this will not be a fad.... I don't think it is, but for those of us who have always operated this way it is very satisfying to see the country come full circle from back to the basics."
—**Sean Dutson**, Hilton World Wide; Boston, MA

IX. BUSINESS ANALYSIS: THE ART OF THE POSSIBLE AND PROFITABLE

HOW MUCH WILL SUSTAINABILITY COST? THAT'S THE FIRST QUESTION MOST BUSINESSES ASK. BUT AS THESE CASE STUDIES SHOW, EMBRACING SUSTAINABILITY CAN ASSURE STEADY SUPPLIES OF RAW MATERIALS, INCREASE CONSUMER LOYALTY, AND BOOST PROFITABILITY.

AGRICULTURE: DAIRY MANAGEMENT INC.'S INNOVATION CENTER

The livestock industry is often cast as the agricultural villain in the debate about climate change. The dairy industry is responsible for a heavy share of greenhouse-gas emissions: 137 million metric tons of carbon dioxide equivalents each year, or 2 percent of total U.S. emissions.

But the dairy industry is working hard to change that. In 2007, farmers decided to make sustainability one of the focuses of Dairy Management Inc., the non-profit responsible for marketing dairy products. A year later, the group created an Innovation Center, which identified 10 sustainability projects to slash emissions by 14 percent by 2020 and create $238 million in business value.

The first step was to commission a life-cycle analysis, which identified the total greenhouse-gas emissions at every point in the production cycle, or as dairymen like to say "from grass to glass." More than 51 percent of emissions—17.85 million metric tons—came during the production of milk, more than twice as many as the next highest contributor, feed production.

Two projects are of particular interest. The first, dubbed Cow of the Future, funds research to help reduce enteric methane emissions—a.k.a. the gas released when cows belch (and they belch a lot). Indeed, enteric emissions make up 25 percent of the dairy industry's carbon footprint. Multiple research projects are underway, including studies that look at whether flax seed or oregano added to feed could reduce such emissions. To date, more than 160 researchers are working on reducing enteric emissions. In 2013, those researchers will publish two scientific papers on mitigating greenhouse gases.

A program called Dairy Power takes on another challenge: manure, which is second only to enteric emissions in the creation of greenhouse gases during milk production. Digester systems help to turn waste into a renewable source of energy. Manure-derived methane can be used to generate on-farm electricity, heat, and hot water, or it can be transported to a central facility for processing and sale as electricity or compressed natural gas to run vehicles and heat homes and businesses. In 2011, the Innovation Center partnered with Fair Oaks Farms, a 30,000-head dairy farm in Indiana, and Ruan Transportation Management Systems to pilot the use of compressed natural gas from the farm's digester for a fleet of 42 long-haul trucks that transport raw milk from the farm to processing centers throughout the Midwest. The fleet is expected to save more than 1.5 million gallons of diesel fuel per year.

In 2008, there were 158 dairy digesters in the United States; there are now 192. The Innovation Center is at work on a plan to help finance and build 1,300 more digesters. Subsequent research on digesters has revealed that they are even more powerful when the manure is combined with food waste. The group is now working to build partnerships between farmers and retailers to redirect food scraps from landfills to the digesters. The project could provide enough energy to power 55,000 homes, provide natural nitrogen and fertilizer, and eliminate 20 million tons, or 20 percent of the country's food waste.

> "Point-to-point delivery may not sound environmentally friendly at first. But the old distribution networks are less efficient than one might think."

DISTRIBUTION: SEA2TABLE

For anyone who knows anything about the seafood business, the “shocking” headline that as much as 40 percent of fish is mislabeled was no surprise at all. Seafood supply chains are deliberately opaque. Fishermen sell to big middlemen who sell to little middlemen who sell to chefs and consumers. Knowing where the fish comes from (and apparently even what species it is) has been the fish world’s equivalent of a state secret. If everyone knew where distributors got their fish, how would they make a buck?

Sustainable seafood distributor Sea2Table was founded in 2009 with the mission to turn the traditional model on its head. It ships fish directly from fishermen to its customers and tells them exactly where it comes from. Chefs get fish that is sustainably caught and often less than 24 hours off the boat, and fishermen get a higher price because the supply chain is short. Sea2Table is profitable and growing fast: The company doubled its revenues in 2012 to $3.5 million and expects them to double again in 2013.

Sea2Table began after its co-founder Sean Dimin went on a family vacation to the Caribbean island of Tobago. There, he found exquisite, sustainably caught fish and fishermen with no export market. In 2006, the Dimin family began to buy, pack, and deliver fish from the island to restaurants in New York City. In 2009, they refined their strategy to take advantage of FedEx’s existing, and far more efficient, logistics and distribution networks. Sea2Table now works with fisheries in Alaska, the Carolinas, the Chesapeake Bay, Florida, New York, and Maine and has nearly 600 restaurant customers in nearly every state. It promotes less well-known species such as Escolar, periwinkles, and Conger eel that help to take the pressure off popular and overfished species such as tuna and cod.

Point-to-point delivery may not sound environmentally friendly at first. But the old distribution networks are less efficient than one might think. Fish is moved on established routes for refrigerated trucks, and that often means that seafood goes from the Gulf Coast to New York, where it is bought and sold, then back to chefs in Miami. Sea2Table operates kind of like a 1-800-Flowers for fish, finding the best way to get its perishable product from point A to point B. For example, fresh fish going from Florida to Chicago is air shipped. But if its destination is anywhere within 300 miles of port, Sea2Table uses FedEx Ground.

Fish that is frozen at sea—the fastest growing part of Sea2Table’s business—is sent by truck or train to one of the distributor’s seven warehouses, which are strategically placed to be within 300 miles of 95 percent of the U.S. population.

Sea2Table’s next big push is into the college market. University dining services care about provenance and sustainability. They also buy in volume, which allows Sea2Table to guarantee prices for fishermen before they go out on the water. It is also testing a home-delivery service, which it hopes to roll out later this year.

MANUFACTURING: UNILEVER

These days, most companies have sustainability goals. But at Unilever, it is more than a feel-good plan to reduce its environmental impact: Sustainability is inextricably linked to growth. “Unilever’s future success depends upon being able to decouple our growth from our environmental footprint,” said Paul Polman, the consumer products giant’s chief executive.

To that end, Polman decided in 2010 to stop giving quarterly financial guidance, a move that allows the company’s leadership to focus on the longer term. The company also developed a Sustainable Living Plan with some 60 goals, each with a specific deadline, to improve health and hygiene, nutrition, and reduce greenhouse gases, among others.

Unilever has dozens of sustainable-food initiatives, including its much-talked about decision to source 100 percent of its tea from Rainforest Alliance certified estates by 2020. (Already, 25 percent of Lipton brand teas were fully certified and 32 percent contained some tea from certified farms.)

Two other projects are also notable. Hellman’s Mayonnaise, one of the company’s most recognizable brands, is working to source exclusively cage-free eggs. Hellmann’s Light was the first to get the makeover. The line now uses only cage-free eggs, a total of 3.5 million pounds of eggs from 140,000 laying hens. Unfortunately, there is not yet a large enough supply to sustain all of Hellman’s brands. All told, the company uses about 64 million pounds of eggs each year. It plans to use 100 percent cage-free eggs by 2020.

Unilever also is one of the largest buyers of palm oil in the world, using about 3 percent of the global production to make products such as margarine, soups, sauces, and ice cream as well as shampoos and soaps. More than 80 percent of the world’s oil palm is grown in Indonesia and Malaysia. To meet demand, about 50,000 square miles is cleared every year. It’s an enormous contributor to deforestation, which accounts for some 20 percent of all greenhouse gases.

Palm oil production is anything but transparent. The majority of the world’s supplies are not traceable back to the plantation on which they were grown. Oil from different places, mills, and countries is intermingled at each stage of production and delivery. As a first step towards sustainable production, Unilever supports a system called GreenPalm, in which growers are awarded certificates for each ton of palm oil that has been sustainably produced. At the end of 2012, three years ahead of schedule, all of Unilever’s palm oil purchases were covered by GreenPalm. Unilever is now working to buy palm oil from individual producers, and its new goal is to source all palm oil from traceable sources by 2020. “Our goals are for 2020 not because we don’t want to move faster but because the supply is not there,” says Jessica Sobel, the head of sustainability for Unilever North America. “But that’s how big brands like Hellman’s or Lipton can lead an industry. Suppliers see there is a big market for sustainability.”

RETAIL: WHOLE FOODS MARKET

When Chad Sarno, the research and development chef for Whole Food Market's Health Starts Here (HSH) initiative suggested that stores put in a "grains and beans" bar, no one really thought it would work. A salad bar filled with bins of plain brown rice, quinoa, and green beans? Boring.

But the grain bars were a surprise hit. Signs that suggested tempting flavor combinations that made creating healthful salads fun. Indeed, they were so popular that Whole Foods has introduced greens, beans, and grains stations right alongside sandwich, barbecue, and pizza counters in 10 stores. "What was amazing was that customers loved the simplicity," said Sarno. "And the options to create dishes themselves."

Prepared foods are a booming business for grocers. In 2012, they were worth $19.5 billion, up more than 25 percent from the previous year, according to research firm Packaged Facts. Through its Health Starts Here program, launched in 2010, Whole Foods Market has made it its mission to ensure that many of the grab-and-go items are healthful options. It has soups, salads, even pizzas that meet its HSH standards: foods that are nutrient dense, minimally processed, and include healthy fats and mostly plant-based ingredients. Their customers' response has been overwhelmingly enthusiastic: HSH soups have seen 30 percent year-over-year growth; salad sales are up 40 percent.

The demand for healthful foods is driven in part by the creative way that Whole Foods presents them. In addition to the usual salad bar, stores also offer "Shakers," prepackaged salads that come in a cup with a portion of dressing. Customers pour the dressing on, close the lid, and shake the salad to mix it up, then eat it from the cup. Popular "flavors" include the Southwest shaker with quinoa, red pepper, zucchini, black beans, salsa, sunflower seeds, and a tomato-herb dressing and the Asian, which includes brown rice, shredded cabbage, edamame, mushrooms, carrots, almonds, and carrot-ginger dressing. Stores also provide recipe cards for healthful dishes such as apple-flax oatmeal and set up end-of-aisle shelving with all the ingredients that customers need to make them.

Health Starts Here dishes are even available at the holidays. In 2012, Mid-Atlantic region stores offered a premade Thanksgiving dinner, with three-ounce portions of turkey, mushroom-barley soup, garlicky greens, and butternut squash purée. "The reality is not everyone is at home cooking a full dinner," says Paul White, Whole Foods' global coordinator for prepared foods. "We try to bring convenience together with the principles of healthy eating."

X. MARKETING PERSPECTIVES: THE SELLING OF DELICIOUS, HEALTHY, SUSTAINABLE FOOD CHOICES

DINERS SAY THEY CARE ABOUT HEALTH AND SUSTAINABILITY. BUT DOES THAT MEAN THEY WILL ACTUALLY PAY FOR IT? THESE FOUR FOODSERVICE FIRMS ARE PROVING THAT SAVVY MARKETING AND DELICIOUS RECIPES CAN CLOSE THE DEAL.

BON APPÉTIT MANAGEMENT

When Fedele Bauccio cofounded Bon Appétit Management Company in 1987, a meal in a cafeteria often meant mystery meat and canned peaches. But Bauccio saw the sad state of affairs as a business opportunity and began to hire professional chefs to cook food from scratch.

Chefs being chefs, they wanted the best ingredients. Their efforts helped the company to discover its mission: “food service for a sustainable future.” Today, the 140 million meals it serves each year at colleges and corporations around the country include cage-free eggs, antibiotic-free poultry and ground beef, and sustainable-only seafood. Its 200-plus customers—Google, Twitter, Starbucks, and elite universities Duke and the University of Pennsylvania—generate about $700 million in revenues annually.

Bon Appétit’s first step was buying local. Starting in 1999—long before the word “locavore” entered the dictionary—the company institutionalized a farm-to-fork program that requires its chefs to buy at least 20 percent of their ingredients from small, owner-operated farms, fishers, and artisan producers within 150 miles of their kitchens. In the beginning, Bauccio didn’t talk much about the program; he didn’t think anyone was interested. But soon, it was clear the firm was onto something. In 2005, Bon Appétit held its first Eat Local Challenge, a day when chefs have to source an all-local meal (produce, grains, meats, sweeteners, fats—everything but salt) from local producers.

> “Replacing canned soda with filtered and flavored waters diverted half a million cans from the landfill and saved another $125,000, while also promoting healthier drinks.”

Today, sustainable food is the core of Bon Appétit’s brand. The company has continued to push the boundaries of sustainable sourcing: In 2011, it switched to 100 percent certified-humane ground beef, and by 2015, it will no longer serve any pork from animals raised in gestation crates. It also is encouraging its chefs to go beyond sustainable seafood (low-on-the-food-chain species such as sardines and oysters and bigger fish that are less widely eaten) to seafood that is locally caught. During its first Eat Local Fish Challenge, in 2012, chefs served 55 different species of seafood, including bluefish, red crab, and albacore tuna. Even chefs in landlocked states found a way to participate: At State Auto Insurance Companies in Columbus, Ohio, yellow perch from Lake Eerie was served beer battered with a chèvre cream sauce.

Bon Appétit’s latest push is a custom nutrition tool that calculates a “well-being score” that is posted next to the name of each dish so that diners can see at a glance what the healthiest choices are. As a founding member of the Equitable Food Initiative, a group dedicated to developing and implementing food standards that improve working conditions for farm laborers, it is also working to put farmworkers’ rights on the national food-reform agenda.

SEASONS 52

The concept of Seasons 52 isn't an obvious one for a restaurant group like Darden. The owners of the Olive Garden and Red Lobster chains have built their businesses on consistency and big portions. At Seasons 52, the menu changes with the seasons, and nothing on the menu has more than 475 calories. Nonetheless, the chain, which opened its first restaurant in 2002, is thriving. Darden opened 10 new Seasons 52 restaurants in 2012, bringing the total to 32 outlets in 16 states. It expects to continue to expand at a similar clip.

Seasons 52 makes up for its smaller portions and calorie counts through what it calls high-impact flavors. The chefs cook many items in the restaurants' wood-fired grills and brick ovens and lean heavily on herbs and spices. Desserts are the only exception to the no-butter rule. But even there, there's a catch: Seasons 52's "mini indulgences" are no bigger than three ounces.

The restaurants' dishes change every quarter, but Corporate Executive Chef Clifford Pleau plans his menus a year in advance. It isn't as hard as it might seem: In the summer, the dishes star corn, tomatoes, and watermelon, while in autumn, there are delicata and butternut squashes, apples, and cranberries. Pleau's menus also stand apart because they highlight regional specialties; in California, he uses Meyer lemons while on the East Coast, he uses Key limes. The menus have a list of weekly specials so that chefs can incorporate Copper River salmon, which is only available for a few weeks, or, say, purple Brussels sprouts from the Santa Monica Farmers Market. When chefs find something new at the market, they simply snap a photo of it with their iPhone and send it to Pleau, who advises them on how to use it within the confines of the menu.

Even with dishes such as wood-roasted pork tenderloin and roasted artichoke-stuffed shrimp, there are inevitably some complaints about portion sizes. Seasons 52 is finding ways to satisfy those diners, too. It now offers an 11-ounce steak made from Nebraska-raised Piedmontese beef, which has 30 to 35 calories per ounce instead of 50 to 55 calories an ounce in traditional breeds. "No one wakes up and says, 'I don't want to be healthy today,'" says Pleau. "We offer a place where they can do it and still eat well."

LYFE KITCHEN

What is the best way to get Americans to eat healthy dishes like "unfried chicken" and roasted Brussels sprouts? Persuade them that they won't taste healthy. "We don't sell health," says Mike Donahue, chief communications officer for the new fast-casual chain LYFE Kitchen. "We sell taste."

It sounds like an uphill battle, especially for a company with so many rules about what goes on its menu. LYFE—the acronym stands for "Love Your Food Everyday"—uses no butter, cream, white flour, high-fructose corn syrup, transfats, additives, or preservatives. Every dish, from the quinoa wrap to the grass-fed cheeseburger, has less than 600 calories and no more than 1,000 milligrams of sodium. But in 2012, one year after opening its first restaurant in Palo Alto, California, LYFE could brag that it had served nearly 10,000 pounds of Brussels sprouts and had beat its growth projections by 25 percent. By the end of 2013, LYFE plans to open 10 restaurants, with hundreds more planned over the next five years.

Founded by a team of former McDonald's executives, LYFE is using fast-food industry practices to sell healthy and sustainable food to the mass market. Its kitchens are specially designed to ensure that cooks don't waste a step, or a second (for every 15 seconds saved, the store can build one percent of sales capacity). Diners order at a counter but are given a coaster embedded with an RFID chip that tells the waitstaff where the customer is sitting. Every meal is cooked to order and served within 10 minutes.

LYFE has equally high standards for its suppliers. Mary's Chickens provides air-chilled, rather than water-bathed, chickens, a process that saves 30,000 gallons of water each day. LYFE's cheese comes from Fiscalini, a Modesto dairy that uses methane digesters to turn cow manure into all the electricity it needs for its farm and then some. As LYFE expands beyond California, it is working with suppliers such as Earthbound Farm, the country's largest supplier of organic produce, to connect it with nearby growers that meet its strict standards.

Most important is that the complexity of sourcing and producing the food is invisible to LYFE Kitchen's customers. "In a time starved, frenetic world, people want to know that they are making good decisions," says Donahue. "They are looking for someone to make it easy for them."

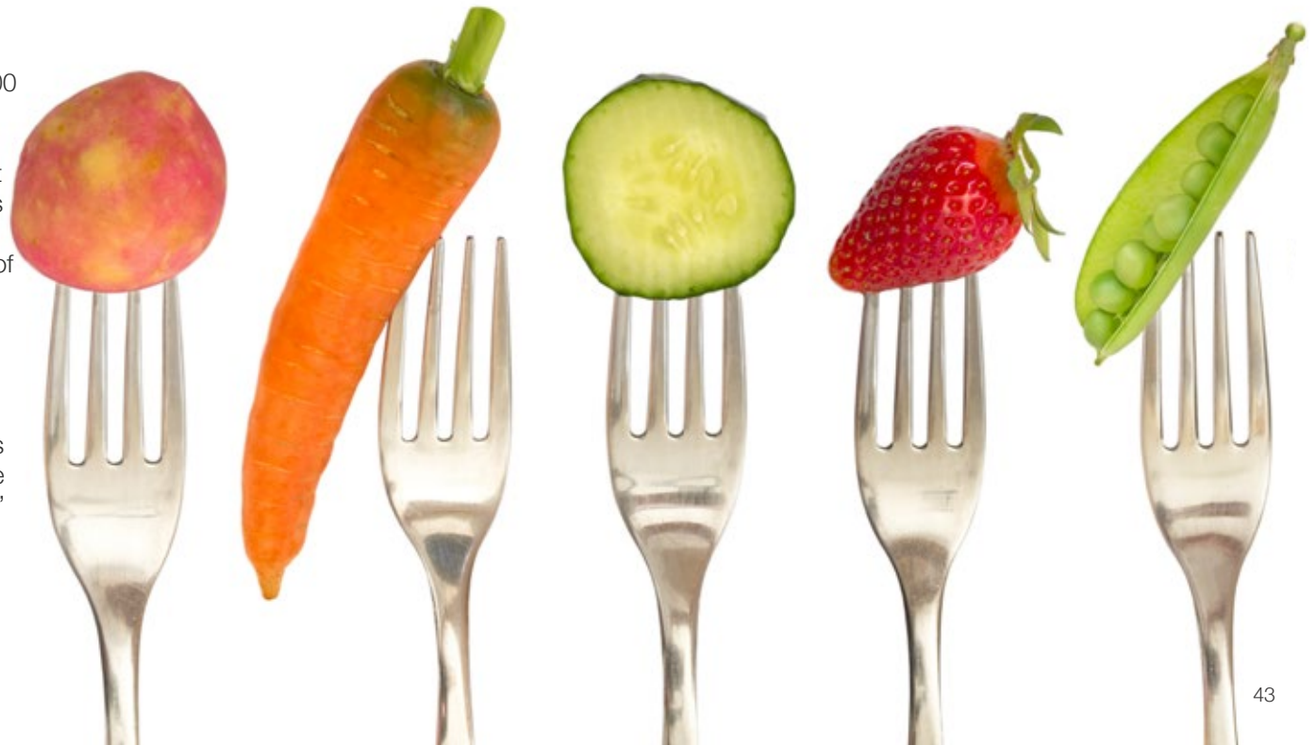
UNIVERSITY OF MASSACHUSETTS DINING PROGRAM

The University of Massachusetts Dining Services, unlike many food businesses, does not have to persuade its customers that healthy and sustainable food matters. Student surveys show that a whopping 95 percent of students feel healthy options are important, 96 percent want to incorporate fruits and vegetables into their diets, and 84 percent support buying local. What it does have to do is provide all of that 40,000 times a day at a cost of about $3 per plate.

It's a challenge that Ken Toong, the executive director of auxillary enterprises , has embraced. Every egg served is now cage-free, every cup of coffee comes from shade-grown, organic, Fair-Trade beans, and nearly all the seafood is certified sustainable. More than a quarter of the kitchen's produce is purchased locally. These decisions have been a boon to business: Since 1999, student participation in the university meal plan has doubled, from 8,300 to 16,500. Revenues have jumped from $28 million to $78 million, making UMass the second largest dining-services operation in the country.

Toong spends more on food than his competitors (universities on average spend between $2.50 and $2.75 per plate), but he makes up for it by cutting costs elsewhere. For example, UMass has aggressively moved to reduce food waste: It eliminated trays in all the dining halls, which slashed the amount of food thrown away by 30 percent. It also mandated that no food is made more than 50 minutes before it is served, a move that saved the university $300,000 annually. Replacing canned soda with filtered and flavored waters diverted half a million cans from the landfill and saved another $125,000, while also promoting healthier drinks.

The program also earns customer loyalty by educating students about its sustainability efforts. Notably, in 2010, it helped to transform one-quarter of an acre of underused grass lawns on the campus into a garden. The space is used to teach children from the community about agriculture, and to grow food. In the summer of 2012, volunteers harvested 2,000 pounds of food, which was served at the UMass University Club. The White House recognized the permaculture initiative as a campus champion of change.



XI. PRINCIPLES OF HEALTHY, SUSTAINABLE MENUS: GUIDANCE FOR CHEFS, FOODSERVICE OPERATORS, AND THEIR CUSTOMERS

Consumers say they want food that is healthier, sustainable, and ethically sourced, but figuring out which foods to eat is often not easy. As a result, the dining public is looking to chefs and food-industry leaders to help them make the "right" choices. Culinary professionals are responding. But giving people what they want isn't always easy either. Some diners believe that foods advertised as "farm to table" or certified with sustainability labels are also healthier. While customers don't always purchase what they say they want, these trends are profoundly changing the landscape of the foodservice business.

The **Principles of Healthy, Sustainable Menus**, an outgrowth of the **Menus of Change™ Leadership Initiative** co-presented by The Culinary Institute of America (CIA) and Harvard School of Public Health (HSPH) Department of Nutrition, represent unique guidance for the foodservice industry. They incorporate findings from nutrition and environmental science perspectives on optimal food choices, trends in consumer preferences, and impacts of projected demographic shifts in order to provide culinary insight and menu strategies that build on promising innovation already occurring in the sector.

The principles anticipate that fast-moving, mid- and long-term global trends—from continued population growth and increasing resource shortages to commodity price spikes and food security issues—will increasingly reframe how we think about food and foodservice in the United States. They also consider that the rise in diet-related chronic diseases suggests that many of today's food and foodservice business models cannot hold unchanged for the long term. They outline pivotal culinary strategies designed to increase the odds customers will reward pioneering and innovative restaurants and other industry operations with their business.

In short, the Menus of Change Principles offer a guide to *optimal* menu design and innovations for future culinary development to promote the foodservice industry's abundant creativity and entrepreneurial dynamism in support of a future of tremendous opportunity.

Collectively, these principles and strategies also speak to our most vulnerable members of society. Chefs who are inspired by the possibility of delicious, healthy, and sustainable foods are working to make these flavors more accessible across America, in K-to-12 schools, in hospitals, and in low-income neighborhoods. Without the benefit of culinary expertise and insight, a focus on minimal food budgets relying on inexpensive ingredients can often be a recipe for failure, whether the customer is a child or an adult, middle-class or economically disadvantaged, or healthy or sick.

Finally, the Menus of Change Principles have not been chiseled in stone; rather, they are designed to be part of an interactive, cooperative, and evolving process. As science progresses, trends shift, and new opportunities and challenges come to light, we will revisit and revise this document annually. Please join the conversation at the annual Menus of Change Leadership Summit or online to help us further strengthen this essential guidance for the foodservice sector. You can reach us at **info@menusofchange.org**.

For additional guidance on sustainability and nutrition science-based dietary advice, consult the CIA-HSPH Menus of Change website, **www.menusofchange.org** and the HSPH's The Nutrition Source website, **www.nutritionsource.org**, which includes additional CIA-HSPH integrated diet and culinary-strategy information.

OUR APPROACH: DIVERSITY OF STRATEGIES

Any approach to providing guidance on nutrition, the environment, and culinary insight to business leaders must recognize that America's $660 billion foodservice industry is as diverse as it is large and omnipresent in our culture. Customers, quite apart from their interest in health, sustainability, or food ethics, look to different kinds of operations to fill a variety of needs and interests. Appetites and preferences vary, depending on whether the meal is a workplace lunch, a mid-week dinner with the family, a snack on the run, or a celebratory occasion. What a diner or a family chooses to eat and order in a single instance is less important for their health and the environment than the aggregate pattern over days and weeks. Chefs and the foodservice industry have an enormous opportunity to embrace change, while still preserving a wide range of options for an American public that often wants someone else to do the cooking. These principles and strategies, together with the Menus of Change Annual Report, are intended to support innovation on the part of operators and entrepreneurs wherever they are positioned in the industry, and help connect them with their aspirations and their unique views of imperatives and opportunities.

MENU CONCEPTS AND GENERAL OPERATIONS

1. Transparency and Consumer Values. Providing customers with abundant information about food production methods, sourcing strategies, calorie and nutrient values, labor practices, animal welfare, and environmental impacts is a necessity in our technology-driven and networked era. Consumer engagement is driven by the rise in food-safety and fraud alerts, a growing interest in sustainability and food ethics, and a hyperconnectivity that yields instant access to information such as impending crop failures or the latest farm-labor conditions across global supply chains. Consumers can learn about what they eat regardless of what chefs and businesses share. Given that, food operators can build trust by learning about environmental and social issues in the food system and sharing information about their own practices. Identifying the farms that grow key ingredients, for example, is a strategy that creates value and brand identity and one that is quickly becoming a standard practice. Going further and explaining how food is produced and the rationale for sourcing decisions are the next steps, while limiting or restricting information on hot-button consumer issues such as calories, trans fats, genetically modified ingredients, or processing methods are approaches not likely to survive over the long term. Operators who do not adjust business models and strategies to anticipate the impacts of this accelerating trend risk disappointing the dining public and having to play costly catch-up as such issues assume greater urgency with the public.

2. Fresh, Seasonal, both Local and Global. For chefs, peak-of-season fruits and vegetables can help create unbeatable flavors—and marketing opportunities. When designing menus, draw ideas and inspiration from local farmers and their crops during your growing season as well as the varieties and growing seasons of more distant regions. The advantages of local sourcing include working with smaller producers who may be more willing to experiment with varieties that bring interest and greater flavor to the table. A focus on local foods also can play an important role in building community by encouraging school children, retailers, media, and others to learn how to grow food, steward the land, and adopt healthier eating habits. But designing menus to draw on in-season fruits and vegetables from more distant farms also is a key strategy for bringing fresh flavors to menus throughout the year.

3. Better Agricultural Production Methods: Rewarding Best Practices. Sourcing sustainably grown foods is complex, but there is one important rule of thumb. The environmental cost of food is largely determined by how it is produced, not where it is grown. The best farms and ranches protect and restore natural systems and reduce greenhouse-gas emissions through effective management practices, such as choosing crops well-suited for their local growing conditions, minimizing use of pesticides and fertilizers, and avoiding the use of groundwater for irrigation. Better-managed farms sometimes qualify for organic or other sustainable-farming certifications. But many—including smaller farms—simply adopt better practices. The most powerful strategies for supporting better farms include aligning menus to emphasize fresh foods during the peak of their local growing season and shifting purchases towards farms that have responsible management programs.

4. Globally Inspired, Largely Plant-Based Cooking. Scientific research suggests that the most effective way to help diners make healthy, sustainable food choices is to shift our collective diets to mostly plant-based foods. Growing plants for food generally has less of a negative impact on the environment than raising livestock, as livestock have to eat lots of plants to produce a smaller amount of food. In fact, no other single decision in the professional kitchen—or in the boardrooms of foodservice companies—can compare in terms of the benefits of advancing global environmental sustainability. From the well-researched Mediterranean diet to the cuisines of Asia and Latin America, traditional food cultures offer a myriad of flavor strategies to support innovation around healthy, delicious, even craveable cooking that rebalances ratios between foods from animal and plant sources.

5. Whole, Minimally Processed Foods—With Important Caveats. In general, consumers and chefs should first focus on whole, minimally processed foods. Such foods are typically higher in micronutrient value and less likely to contain high levels of added sugars, saturated or trans fats, and sodium. (Indeed, nearly three-quarters of the sodium in the U.S. food supply is estimated to come from processed foods). Whole, minimally processed foods are also typically slowly metabolized, preventing sharp increases in blood sugar that over time may lead to insulin resistance.

That said, some processed foods—low-sodium tomato paste, wine, nut butters, frozen fruits and vegetables, mayonnaise, dark chocolate, canned low-sodium beans, 100 percent whole-grain crackers, fresh-cut vegetables, spice mixtures, yogurt, reduced sodium sauces, many kinds of canned fish and shellfish, among other things—can be incorporated into healthy meals. Processing can also be used to extend the season of local and sustainably grown produce and to make use of cosmetically imperfect foods, especially produce.

6. Grow Everyday Options, While Honoring Special Occasion Traditions. The foodservice industry historically developed around special occasion dining. Today's industry, however, is increasingly responsible for providing everyday food choices to a substantial segment of the U.S. population. From a health and environmental perspective, there will always be room in the industry for indulgence and special occasion foods. However, the real opportunity in menu and concept development is the expansion of everyday food and menu choices that embrace current nutrition and environmental science, as well as emerging consumer values about how food is produced.

7. Promote Health and Sustainability Through Inspiring Menus. To sell healthy and sustainable food choices, lead with messages about flavor, rather than actively marketing health attributes. Research shows that taste trumps nearly all, even if customers want chefs, on some level, to help them avoid foods that increase their risk of chronic disease. Messages that chefs care and are paying attention to how and from whom they are sourcing their ingredients—such as by naming specific farms and growing practices (e.g., organic)—can enhance perceptions of healthier food choices (if, in fact, they are healthier).

8. Portion Size and Calorie Quality. Moderating portion size is one of the biggest steps foodservice operators can take towards reversing obesity trends and reducing food waste. This is different than offering multiple portion sizes, as many diners "trade up" to bigger portions, which they see as offering greater value.

Consider menu concepts that change the value proposition for customers from an overemphasis on quantity to a focus on flavor, nutrient quality, culinary adventure, new menu formats, and the total culinary and dining experience (thereby mitigating potential downward pressure on check averages). Calorie quality is also as important. Dishes should feature slowly metabolized whole grains, plant proteins including nuts, legumes, and healthy oils that promote lasting satiety as well as create great flavors.

9. Celebrating Cultural Diversity, Leveraging Demographic Changes. Our respect for cultural diversity and the savoring and preservation of family traditions and centuries-old food cultures is as vital as our public health and environmental sustainability. Fortunately, these imperatives are compatible with these principles of healthy, sustainable menus. Chefs collaborating with nutrition experts and public policy leaders need to reimagine the role of less healthy, culturally based food traditions by limiting portion size, rebalancing ingredient proportions, or offering them less often. At the same time, many chefs are reporting greater success introducing new, healthier and more sustainable menu items instead of reconfiguring existing items. Emerging demographic changes and greater global connectivity are making the American palate more adventurous, giving foodservice leaders a long-term opportunity for creative menu R & D.

10. Designing Operations for the Future. Food and menu design are not the only ways to advance sustainability in foodservice. Choices that affect the way restaurants and other foodservice operations are designed, built, and operated are also important. These include imagining kitchens that support the optimal preparation of fresh, healthy foods and selecting energy- and water-efficient equipment and environmentally friendly building materials. As behavioral economics studies have shown, dining-room operations and foodservice eating spaces also deserve more attention: design, set-up, service, and communication strategies can all lead consumers towards healthier, more sustainable choices.

FOODS AND INGREDIENTS

1. Think Produce First. Focus on fruits and vegetables first—with great diversity across all meals and snacks. Recognize that customers aren't eating nearly enough, when instead they should be filling half their plates with produce. Menus should feature green leafy vegetables and a mix of colorful fruits and vegetables daily. Fruit is best consumed whole or cut, fresh and in season, or frozen and preserved without added sugar or salt. Fruit juice often contains healthy micronutrients, but it also packs a large amount of fast-metabolizing sugar and should be limited to one small glass per day. Dried, unsweetened fruit is also a good choice; though it contains natural sugars, it also contains fiber, which can mitigate negative blood sugar response.

2. Whole, Intact Grains: The New Norm. Menus should offer and highlight slow-metabolizing, whole and intact grains, such as 100 percent whole-grain bread, brown rice, and whole grain/higher protein pasta. Use white flour and other refined carbohydrates sparingly, as their impacts on health are similar to those of sugar and saturated fats. Ideally, new menu items should emphasize whole, intact, or cut—not milled—cooked grains, from wheat berries and oats to quinoa, which can be used creatively in salads, soups, side dishes, breakfast dishes, and more. In baking, blend milled whole grains with intact or cut whole grains to achieve good results.

3. Potatoes: New Directions for Sides. Potatoes have rapid metabolizing impacts on blood sugar, which is of special concern as they are regularly used as a starch to fill plates. Chefs can limit their use of potatoes by combining small portions of them with other, non-starchy vegetables or featuring them as an occasional vegetable, as they do green beans, broccoli, carrots, and peppers. Chefs should also consider healthier alternatives including sweet potatoes, which are rich in beta-carotene and other vitamins, and healthier side dishes that highlight fruits, vegetables, whole grains, legumes, and nuts.

4. Nuts and Legumes to the Center of the Plate. Nuts and legumes are full of flavor, contain plant protein, and are associated with increased satiety. Nuts contain beneficial fats, while legume crops contain fiber and slowly metabolized carbohydrate. Legumes also are renowned for helping to replace nitrogen in the soil and produce impressive quantities of protein per acre. Nuts (including nut butters, flours, and milks) and legumes (including soy foods and legume flours) are an excellent replacement for animal protein. They also are a marketable way to serve and leverage smaller amounts of meat and animal proteins.

5. Choose Healthier Oils, Avoid Trans Fats. Using plant oils and other ingredients that contain unsaturated fats, such as canola, soy, peanut, and olive oils, as well as featuring fish, nuts, seeds, avocados, and whole grains, are simple ways to create healthier menus. Research shows that reducing saturated fat is good for health if replaced with "good" fats, especially polyunsaturated fats, instead of refined carbohydrates such as white bread, white rice, mashed potatoes, and sugary drinks. High-flavor fats and oils that contain more saturated fat—including butter, cream, lard, and coconut oil—can have a place in healthy cooking if used only occasionally in limited, strategic applications. Trans fats from partially hydrogenated vegetable oils, now labeled a "metabolic poison" by leading medical scientists, have no place in foodservice kitchens.

6. Palatability and Health: End the Low-fat Myth. Current nutrition science reverses the mistaken belief we need to limit all fat. Moderate and even high levels of beneficial fats in the diet—from (most) non-hydrogenated plant oils, nuts, nut butters, avocados, and fish—are associated with optimal nutrition and healthy weight. Beneficial fats paired with an abundance of vegetables, whole grains, legumes, and nuts can give our diets a baseline of slow-metabolizing, healthy foods, which are associated with increased satiety. A more liberal usage of healthy fats, offering the potential to deliver high-impact flavors, might represent the difference between consumers liking—or not liking—healthier and more environmentally friendly foods. Even small, occasional servings of deep-fried foods and condiments are appropriate offerings if operators use healthy, non-hydrogenated oils, and avoid potatoes, breading, and other refined carbohydrates in favor of fish, vegetables, legumes, and legume flour. Scientific research confirms that the vast majority of people reporting better adherence to a moderate- or higher-fat, healthy diet.

7. More Kinds of Seafood, More Often. Seafood is an important part of a healthy diet, and most Americans don't eat the recommended one to two servings per week of fatty fish, which contain higher levels of health-promoting Omega-3s. However, the focus on just a few species is emptying parts of the oceans of popular species such as cod and tuna and now also fish like menhaden that are a key ingredient in feed for some types of farm-raised fish. Scientific studies have found that the benefits of eating seafood greatly outweigh the risks and that removing or reducing seafood from the diet can have negative effects on health. Serving more seafood more often from responsibly managed sources is the priority. Chefs can have a positive impact on the environment and public health by expanding their understanding of how to source and use a greater variety of responsibly managed and underutilized wild-caught and farm-raised fish and shellfish.

8. Milk, Cheese, and Yogurt: An Evolving, Supporting Role. While there is tremendous innovation underway to improve dairy production and its impact on the environment, the nutrition science on dairy is still unsettled and evolving. Current research suggests that it seems prudent for individuals to limit milk and dairy to one to two servings per day. Chefs should leverage the flavor of cheese (high in saturated fat and sodium) in smaller amounts and minimize the use of butter. Yogurt (without added sugar) is a good choice for professional kitchens, as its consumption is associated with healthy weight.

9. Poultry and Eggs: Good Choices, In Moderation. Chicken and other poultry in moderation is a good choice for healthier protein with a far lower environmental footprint than red meat. Chefs should avoid or minimize the use of processed poultry products which are high in sodium, often as a result of sodium pumps and brining. Eggs in moderation—an average of one per day—can be part of a healthy diet for most people. Creative menu items that mix whole eggs and egg whites for omelets, and eggs with vegetables, are ideal.

10. Red Meat: Smaller Portions, Less Frequently. Red meat—beef, pork, and lamb—can be enjoyed occasionally and in small amounts. Current guidance from nutrition research recommends consuming a maximum of two 3-ounce servings per week. Chefs and menus developers can rethink how meat is used by featuring it in smaller, supporting roles to healthier plant-based choices, and experimenting with meat as a condiment. From an environmental perspective, pork is the better choice among red meats (though not distinguishable from a nutritional perspective). Saturated fat is one health concern associated with red-meat consumption, but it's not the only issue. Chefs should strive to limit bacon and other processed and cured meats, which are associated with even higher incidence of chronic disease than unprocessed red meats. Many diners choose to splurge on red meat when they eat out, and there will always be an appropriate place for meat-centered dishes. But chefs can help to shift eating patterns by building a sense of theater and value in menu concepts that don't rely so heavily on a starring role for animal protein. For example, they might offer delicious meat/vegetable and meat/legume blends, or smaller tasting portions of red meat as part of vegetable-rich, small-plate formats.

11. Added Sugar: Strategies Beyond Current, Unhealthy Excess. Consumers crave sugar, and the foodservice industry responds by selling processed foods and sweets that are loaded with it. But sugar's role in spiking blood-sugar levels and increasing rates of Type 2 diabetes and other chronic diseases mean that professional kitchens should substantially restrict its use. Various strategies include: Choosing processed foods with little or no added sugar; favoring healthy oils over sugar in products such as salad dressings; featuring smaller portions of dessert augmented with fruit; and substituting whole, cut, and dried fruit for sugar in recipes. There is nothing wrong with an occasional dessert; but pastry chefs and dessert specialists need to take up the challenge to create sweets centered on whole grains, nuts, dark chocolate, coffee, fruit, healthy oils, yogurt, small amounts of other low-fat dairy and eggs, and, as appropriate, small amounts of beverage alcohol—with the addition of only small to minimal amounts of sugar and refined carbohydrates.

12. Cut the Salt: Frontiers of Flavor Discovery. The foodservice and food-manufacturing sectors have long been too reliant on salt to do the heavy lifting to create high flavor impact and customer satisfaction. Single items, such as a sandwich or entrée, might contain more than 2,500 milligrams of sodium, well above the current maximum recommended intake of 1,500 milligrams to 2,300 milligrams for the entire day. Chefs should focus on a range of other strategies to deliver flavor including: sourcing the best-quality, high-flavor produce; working with spices, herbs, citrus, and other aromatics; and employing healthy sauces, seasonings, and other flavor-building techniques from around the world. Many chefs are finding success in focusing their innovation where they have the highest aggregation of sodium (e.g., processed meats, cheese and bread) in a single menu item. Others are making progress in implementing an across-the-board incremental 10 to 20 percent sodium reduction in their preparations. Still others are focusing on collaborating with manufacturing partners to reduce sodium using alternative strategies to create desired flavors and textures.

13. Sugary Beverages: Reduce and Innovate. A drastic reduction in sugary beverages represents one of the biggest opportunities for foodservice operators to help reverse the national obesity and diabetes epidemics. Sugary beverages add no nutritional value and contribute negligible satiety. Yet they are a prime source of extra calories in the diet and a principle contributor to the development of Type 2 diabetes, heart disease, and other chronic conditions. Smaller portion sizes and less frequent consumption are steps in the right direction, but nowhere in foodservice is there a greater need of creative, "disruptive" innovation than in the challenge to replace current soda and sugary beverage formulations with more healthful options. Operators should diligently research, support, and promote the products of entrepreneurs and emerging and established brands that are rapidly developing beverage solutions in this important area. Diet sodas and other diet beverages, though lower in calories, may reinforce an aggregate preference for sweet flavors, potentially driving down the appeal of vegetables and other healthy foods. As such, they should be consumed in smaller portions less frequently.

14. Drink Healthy: Water, Coffee, Tea and, with Important Caveats, Beverage Alcohol. Water is the best choice to serve your customers, either plain or with the addition of cut-up fruit, herbs and aromatics, or other natural flavors—and no sugar. Served plain, coffee and tea are calorie-free beverages containing antioxidants, flavonoids, and other biologically active substances that may be good for health. Wine, beer, and other beverage alcohol are a more complicated story of benefits for many individuals with some offsetting risks. Current nutrition guidance suggests a maximum of two drinks per day for men, and one drink per day for women.

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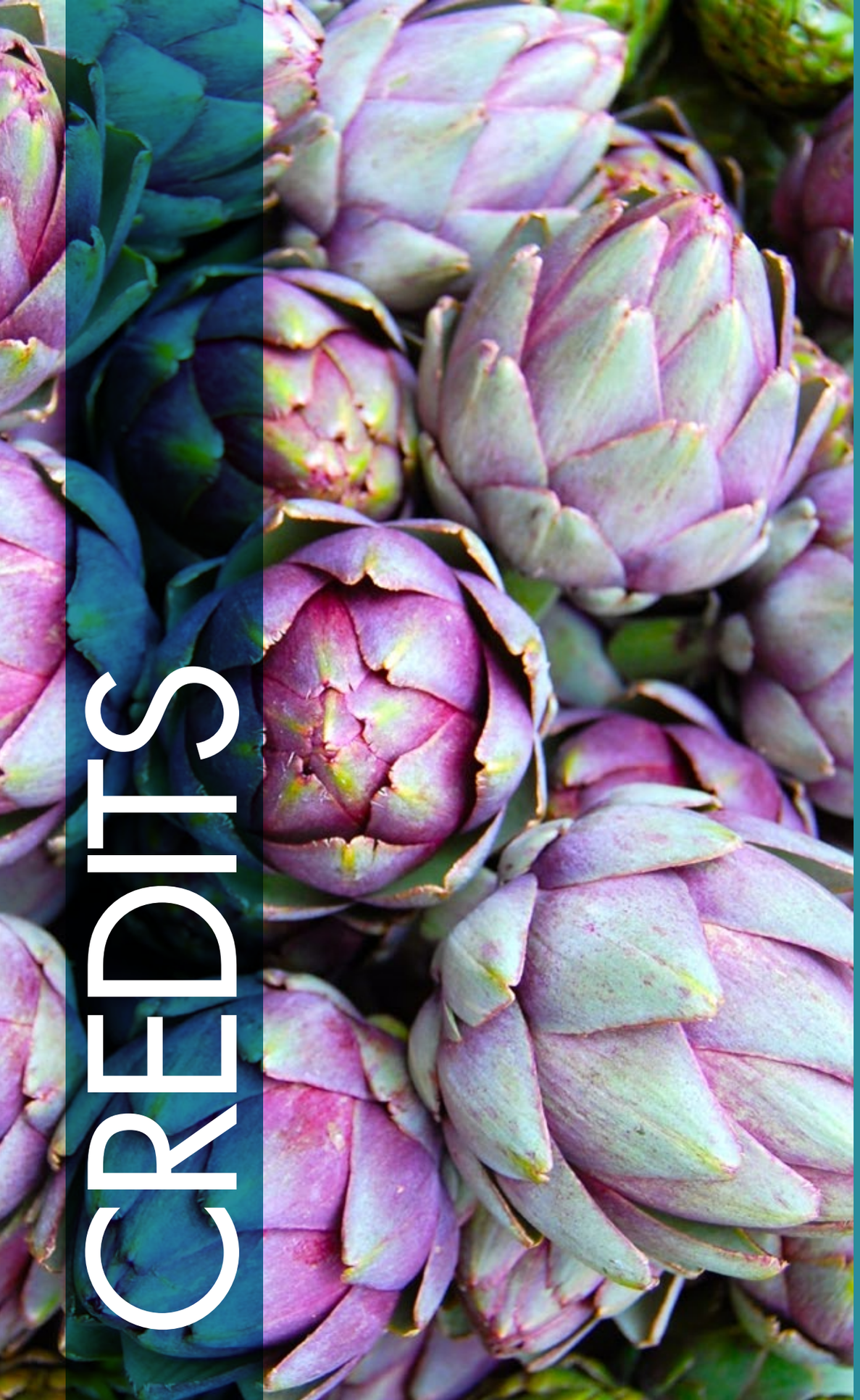

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