

The Power of Our Food Choices

How Organic
& Sustainably Raised
Foods Support
Personal, Community
& Environmental
Health



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ON THE COVER

*Beets from the Ceres Community Garden
grown and harvested by Ceres Teen Gardeners*





Preface

Feeding those in need is noble work. There are a great many non-profit organizations and governmental programs engaged in this work and a good thing, given that more than 49 million Americans experience food insecurity at some point during the year. Those 49 million and others who experience difficulty in feeding themselves because of illness or injury are the most vulnerable of our nation's population. And yet the food that we feed them may be contributing to a host of additional problems.

Our rush to give people calories is understandable given the emergency nature of their needs and our programs. Yet, if we slow down for a moment to look at how both the quality of food and the way it was produced may contribute to raising the risk for illnesses (including cancer), chronic diseases, and infertility; decrease children's ability to learn and thrive; create the conditions for antibiotic-resistant organisms to emerge; and degrade our environment, we realize that our food choices may be problematic.

Access to food is not a right in this country. We do not have a comprehensive approach to making sure that no one goes hungry. Instead, we piecemeal programs together into an inadequate safety net. This problem, a crisis actually, must be tackled with a concerted, national food movement, one that shifts policies and is equally steeped in a call for good nutrition, social justice, and environmental stewardship. Building such a movement will require participation by the emergency food and nutrition providers around the country. But perhaps a first step would be for emergency food programs to explore what it would mean to serve healthy and sustainably grown foods and how they might approach such a goal.



For this paper, Ceres Community Project has culled the scientific literature and developed the rationale to support a critical change in the choices we make as we go about the critical work of feeding those among us in need of nutrition. They present the scientific arguments for why we should be choosing produce that is grown without the use of pesticides, dairy products that are produced without inoculating cows with growth hormones, proteins (meat and poultry) that are grown without the use of non-therapeutic antibiotics, good fats over bad fats, and the elimination of refined sweeteners, including high fructose corn syrup. They review the pros and cons of grass fed beef and farmed fish.

This recitation is intended for all those who are involved in providing nutrition, either as a direct service or through enabling policies and economic incentives. It provides a menu of options for increasing the positive impact on those we aim to support with our food offerings. These choices can also directly impact farmworkers engaged in food production, the quality of life for livestock, the preservation of our precious pollinators, and the conservation of the agricultural soil on which our food is produced. Much is hinged on the choices we make.

The Centers for Disease Control and Prevention (CDC) identifies dietary risk as a leading cause of mortality in the United States. The way in which our health and nutrition policies are created, especially the cost accounting for their associated programs, has perpetuated a disconnect that is costing the American tax payers billions of dollars and resulting in huge negative shifts in the health status of Americans. Our underinvestment in good nutrition is causing a mandatory “overinvestment” in health care costs due to the rise of a range of food-related illnesses, including obesity-related diseases, such as diabetes and cardiovascular diseases. For example, we provide federal subsidies for corn production that becomes the high fructose corn syrup whose consumption heightens the risk of obesity that results in higher health care costs. Our food and nutrition policies and programs must begin to inform our health policies and vice versa. We must start to look at total costs and total benefits from our policy decisions.

The Ceres Community Project, which is also briefly described in this paper, provides emergency food sources for people who are critically ill and their families. At the same time, they have strict criteria for what constitutes nutrient-dense foods, locally produced, and sustainably grown. By combining these criteria, Ceres commits itself to the health of the whole community, including future generations, and to the health of the environment. We have much yet to learn from each other and much work to do to address food insecurity in the United States. It is time to define health broadly and recognize the full value and impact of the choices that we make as we feed the nation’s hungry. It is the intent of this paper to incite a robust conversation about the path ahead.

Barbara Sattler, RN, DrPH, FAAN
Professor, Public Health Program
University of San Francisco



Executive Summary

Every day, thousands of nonprofit and faith-based organizations across the United States provide hope, dignity and sustenance to millions of Americans who because of a host of life circumstances are unable to shop or cook for themselves. We are the safety net for the safety net – a reflection of failed policies which underinvest in food support, subsidize unhealthy food at the expense of healthy food, and fail to make the connection between food and agriculture policies, the epidemic of chronic diseases, and spiraling health care costs facing our country. The entire system undermines our ability to help the people we serve achieve the highest level of health.

As food and nutrition providers we are on the front line of this crisis, with an enormous opportunity to help build a better future – for the people we serve, for the generations to come, and for the environment that supports us. Across the country, important changes are happening. Food Banks are turning away donations of soda and candy, sourcing growing amounts of fresh produce, and creating rating systems to help food pantries and individuals make healthier choices. Feeding America, the nation’s largest domestic hunger relief organization, held its first Fresh Produce Summit in March 2016 and has set a goal to double donations of fresh produce to 1.7 billion pounds over the next 10 years. Meals on Wheels providers are cancelling contracts with industrial food providers, building their own kitchens, and hiring culinary chefs to create healthy and delicious meals made with fresh food. And our colleagues in the Food is Medicine Coalition are building the research base to demonstrate that patients who are well nourished have better quality of life, better treatment outcomes, and lower health care costs – with the goal to have health care providers and insurers reimburse for the cost of food and nutrition services.

There is still much that each of us can do. Every step we take to improve the quality of food we source and distribute supports better health for our clients and builds momentum for broader change, including change at the policy level. If you are unfamiliar with what science tells us about the impact of food choices, we’ve provided a broad overview of key studies related to both human health and environmental health. If you are ready to make changes but aren’t quite sure where to start, here are recommendations to guide your efforts. No one step is more or less important than any other. Take the steps that are easiest and most available to you. Every step makes a difference.

In addition to making changes in how we source and provide food in our own programs, each of us can play an important role in influencing the policy landscape. Educate your local, state and federal elected officials about your work and about the critical relationship between what our clients are eating and their health. Bread for the World’s 2016 Hunger Report: “The Nourishing Effect: Ending Hunger, Improving Health, Reducing Inequality” provides ample data on the effect that hunger and poor diets are having on chronic disease rates and health outcomes. Work is already beginning on the 2018 Farm Bill – our next opportunity to strengthen safety net programs, increase incentives for fresh fruits and vegetables, strengthen the focus on sustainability of farming practices, and encourage subsidies for produce rather than corn, soy and



How to Get Started

1. Increase vegetables, fruits and whole grains.
2. Use the Environmental Working Group's Clean 15 and Dirty Dozen guide to limit pesticide residues. The Clean 15 are the foods with the lowest pesticide residues – you can feel comfortable with non-organic options of these foods. The Dirty Dozen are the foods with the highest levels of pesticide residues – as often as possible, limit these foods unless you can source them organically.
3. Reduce or remove foods with added sugars.
4. Focus on healthy sources of fat including avocados, nuts and seeds, olive oil, coconut oil and pasture-raised animal foods.
5. Reduce refined vegetable oils and eliminate trans fats.
6. Reduce consumption of red meats and pork.
7. Reduce the total amount of animal foods used, and select animal foods—including dairy—raised without antibiotics and bovine growth hormones (BGH).
8. When and where possible, source animal foods—including dairy—that are pasture-raised.
9. Use the Monterey Bay Aquarium's Seafood Watch list to select fish that is lower in toxins and more sustainably fished/farmed.
10. Trade sugary drinks for water and unsweetened tea.

wheat. To get involved, look for Food Policy Councils at the local and state level, or follow the Farm Bill through national organizations such as FRAC, the Food Research Action Center (www.frac.org).

Moving to a healthy and sustainable food system will take leadership, creativity and commitment. It starts with understanding the impact of the choices we make each day, sharing this information with people in our organizations, and identifying steps that we can take. Each step we take is cause for celebration and helps build momentum for positive change across the food system.



Ceres Food Pyramid

Reduce refined vegetable oils and eliminate trans-fats



Select animal foods raised without antibiotics and synthetic hormones



Focus on healthy fats
ie. olive and coconut oils,
avocados, nuts and seeds



Choose foods with low pesticide residue and organic as often as possible





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Reduce or remove foods with added sugars



Reduce consumption of red and processed meats



Source animal foods that are pasture-raised, wild, and/or sustainable



Choose whole grains



Increase vegetables and fruits



Trade sugary drinks for water and unsweetened teas



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Introduction

The sustainability of food choices is now being recognized as a significant factor that should be considered in the recommendations for healthy eating choices. While it was ultimately omitted from the 2015 Dietary Guidelines for Americans, the scientific panel reviewing the research recommended that a statement on this topic be included. In addition, the November 2015 Oldways Common Ground meeting of leading nutrition and food systems experts included as the second of their eleven points of consensus about healthy eating: “Sustainability is essential. We emphatically support the inclusion of sustainability in the 2015 Dietary Guidelines Advisory

Committee report, and affirm the appropriateness and importance of this imperative in the Dietary Guidelines for Americans because food insecurity cannot be solved without sustainable food systems. Inattention to sustainability is willful disregard for the quality and quantity of food available to the next generation, i.e., our own children.”

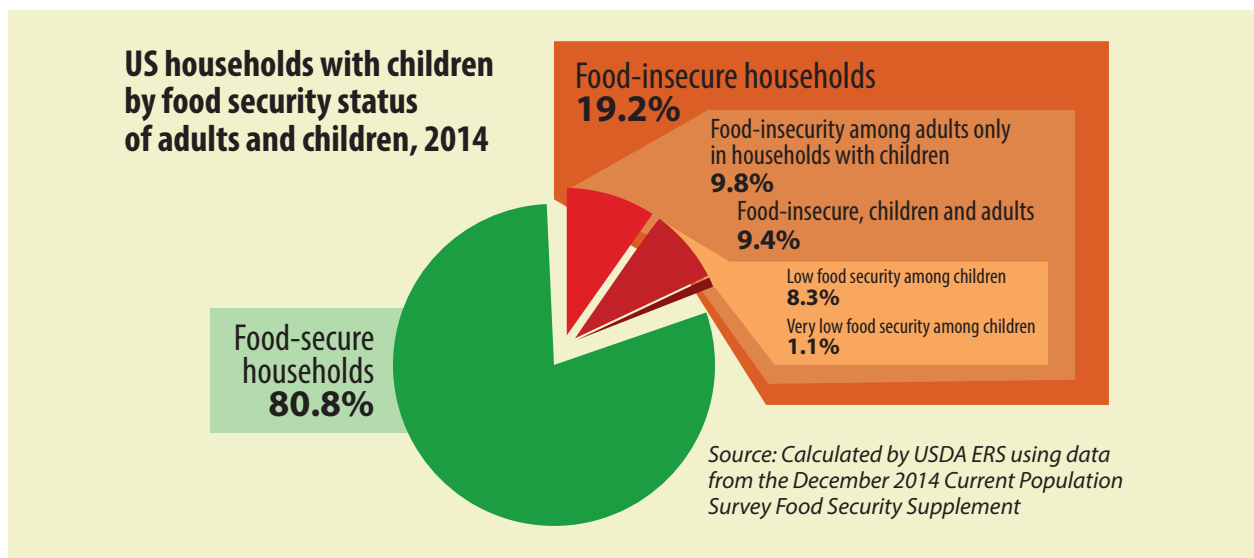
Food insecurity cannot be solved without sustainable food systems.

We know that many nutrition and food service providers, including emergency food banks, are taking strides to improve the quality and sustainability of the food they serve. We heartily support those efforts. This paper is intended to provide support for those efforts and to foster a broader conversation about what constitutes healthy food, and why we as a society should prioritize the availability and cost of that food for all members of our community.

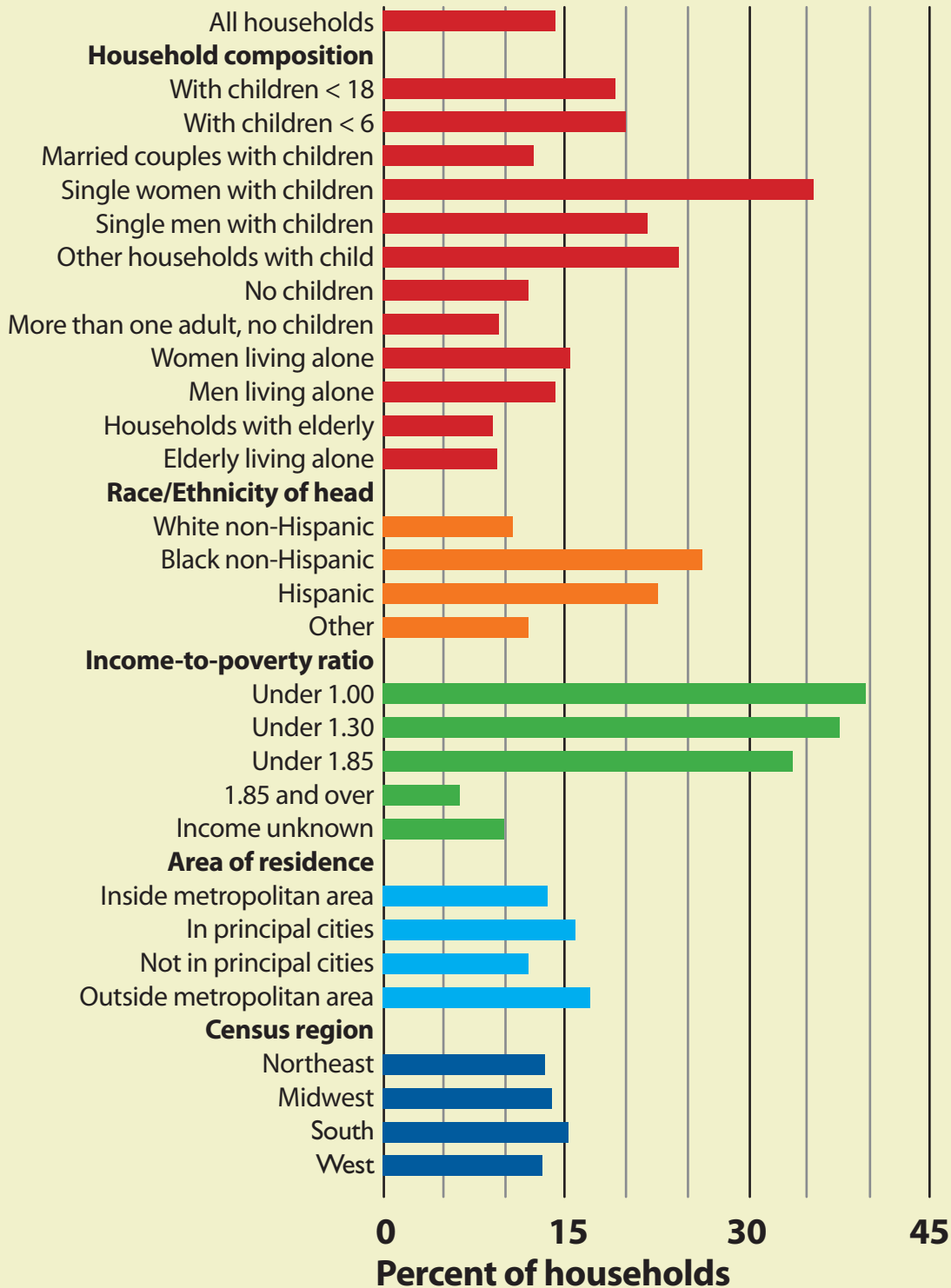
The paper outlines a fraction of the research on the impact of industrial agriculture on population health and the health of our soil, water and air. It also shares important findings on the nutritional benefits of organically raised foods, and the positive impact that organic and sustainable agricultural practices can have for farm workers, soil health, and air and water quality.

The current industrial food system in the United States provides plentiful, relatively inexpensive food for most, however much of it is unhealthy for individuals, it’s produced unsustainably, and millions of Americans still lack the food they need to thrive.

In 2014, 14 percent of households, or 48.1 million Americans, were food insecure (United States Department of Agriculture). These rates were even higher among households with children (see graph), households headed by a single man or woman, and households of racial and ethnic minorities.



Prevalence of food insecurity, 2014



Source: Calculated by ERS using data from the December 2014 Current Population Survey Food Security Supplement

The CDC has identified dietary risk as the leading risk factor for mortality, with more than 1.5 million deaths linked to poor diet annually. Four of the leading ten causes of death in the United States (nearly 54% of all deaths) can be significantly attributed to poor diet including heart disease, cancer, stroke and diabetes. (Centers for Disease Control 2015). In addition, more than 1/3 of adults in the United States were obese in 2010, and sixty-nine percent were either overweight or obese. Obesity is a risk factor for many chronic illnesses.

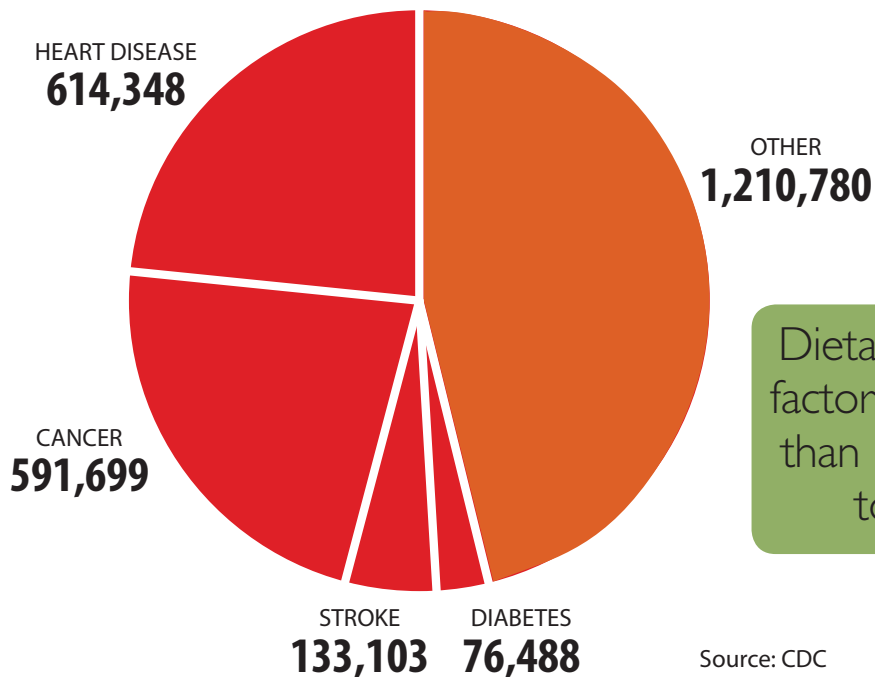


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CAUSES OF DEATH, 2014

TOTAL DEATHS **2,626,418**



Dietary risk is the leading risk factor for mortality, with more than 1.5 million deaths linked to poor diet annually.

Source: CDC

Adults who experience food insecurity have poorer diets than those who have their dietary needs met, and are at a greater risk of becoming overweight or obese. Children raised under these conditions are more likely to become overweight or obese by the time they are adults and therefore are at an increased risk of diet-related illnesses.

Diet-related diseases cost our economy billions of dollars each year. Obesity cost the United States an estimated \$147 billion in 2008. Average annual medical costs for obese individuals are almost \$1,500 higher than those of healthy weights.

Direct cardiovascular disease costs amounted to \$116.3 billion dollars in 2011, while cancer amounted to \$88.7 billion, diabetes \$55.2 billion, and hypertension \$42.7 billion. Adding indirect costs increases these numbers significantly (cardiovascular costs jump to \$215 billion dollars) and the trends show steady rate increases through 2030 for all of these conditions (American Heart Association, 2015).

In comparison, federal and state governments in the United States invest just \$81.9 billion in all food assistance programs combined, including SNAP, WIC, and Older American's Act funding for senior and disabled meal programs. Given what we understand about the critical role that healthy food plays in both preventing and addressing chronic illness and obesity, this underinvestment in healthy food may be one of the costliest decisions we're making.

In addition to this underinvestment at the federal and state level, this crisis presents an opportunity for leadership and innovation among the thousands of nongovernmental organizations across the country that are working every day to address hunger, food insecurity



and the nutritional needs of those who are most vulnerable. While tremendous progress has been made in food quality standards in recent years, there is still considerable variability in the food being provided across the sector and very few organizations have adopted policies addressing the health impacts or the sustainability of the food they purchase and accept as donations.

Tremendous challenges exist – in being able to source adequate quantities of high quality food, in evolving food donation policies and relationships, and in educating and engaging donors to support the added costs of this food. However, the research is unequivocal. Our clients' health, the long-term health of the children we serve, and the ultimate ability of our food system to continue to provide for all of us is at risk. Setting new best practice standards that include both a health and sustainability lens, and educating our clients, donors and other stakeholders about why this matters, will support the best possible health for those we serve today – and help to insure better health and less hunger in the future.

This paper summarizes just a small sample of the extensive research related to the human and environmental costs of conventional agriculture, and the nutritional and environmental benefits of organic and sustainable farming and ranching practices. Our hope is that this paper stimulates conversation and inspires action to ensure that all people have access to food that supports good health throughout their lifetime, and that insures their children and grandchildren can expect the same.

Underinvestment in healthy food may be one of the costliest decisions we're making.

“Feeding ourselves dominates our landscapes, using about half the ice-free land on earth. It sends us into the oceans, where we have fished nearly 90 percent of species to the brink or beyond. It affects all the planet’s natural systems, producing more than 30 percent of global greenhouse gases. Farming uses about 70 percent of our water and pollutes rivers with fertilizer and waste that in turn create vast coastal dead zones. The food on your plate touches everything.”

Tim Zimmermann, Outside Online 2016





Research

Organic vs. Conventional Agriculture

Human Health

Organic foods maximize nutritional value while decreasing toxic exposures to harmful pesticides and other dangerous chemicals that have been linked to a broad range of health issues including cancer, neurological problems and developmental issues. The “Higher antioxidant and lower cadmium concentrations and lower incidence of pesticide residues in organically grown crops: a systematic literature review and meta-analyses,” published in the *British Journal of Nutrition*, analyzed 343 studies documenting the compositional differences between organic

Organic fruits and vegetables are up to 60% higher in a number of key antioxidants than conventionally grown crops.

and conventional crops, and found that organic fruits and vegetables are up to 60 percent higher in a number of key antioxidants than conventionally grown crops (Barański et al. 2014). The researchers concluded that consuming organic fruits, vegetables, grains, and foods made from them would provide additional antioxidants equivalent to eating 1-2 extra portions of fruits and vegetables a day (ibid.). The study also found significantly lower levels of toxic heavy

metals in organic crops. Cadmium levels in organic crops were almost 50 percent lower than in conventionally grown crops and nitrogen concentrations were also found to be significantly lower in organic crops. Concentrations of total nitrogen were 10 percent; nitrate 30 percent and nitrite 87 percent lower in organic compared to conventional crops (ibid.). Finally, the study found that pesticide residues were four times more likely to be found in conventional crops than in organic ones.



To further illustrate the benefits of organic practices, Stephen Kaffka's study of tomatoes conducted at the University of California, Davis, in 2007, found that organic tomatoes have about double the concentration of the beneficial flavonoid quercetin, compared with conventional tomatoes grown on an adjacent field.

More than 1.1 billion pounds of pesticide active ingredients are used on conventionally grown food crops each year in the United States (Grube et al. 2011). The Pesticide Data Program Annual Summary published by the U.S. Department of Agriculture (USDA) found pesticide residues in 62.1 percent of fruits and vegetables, 30 percent of peanut butter samples, and 19 percent of bottled water samples (USDA 2007). Typical United States food consumption patterns can result in high exposures to pesticides that accumulate in our bodies and cause a number of diseases, including birth defects, reproductive disorders, attention-deficit/hyperactivity disorder, and different types of cancers (Sutton et al. 2011).

The widespread use of pesticides has been linked to a number of cancers, including childhood cancers from prenatal and early life exposures (Infante-Rivard and Weichenthal 2008). While the link between pesticides and cancer has long been a concern, a report released in April, 2010 by the President's Cancer Panel found that the true burden of environmentally induced cancer is greatly underestimated as only a few hundred of the more than 80,000 chemicals in use in the United States have been tested for safety (Reuben 2010).

Only a few hundred of the more than 80,000 chemicals in use in the United States have been tested for safety.

Pesticide exposure also has adverse effects on reproductive health. Studies have shown that pesticides can alter semen quality and fertility in men (Hauser 2006) as well as increase the rates of prostate cancer (Diamanti-Kandarakis et al. 2009). Pesticides have been shown to affect puberty in women, menstrual and ovarian function, fertility and fecundity, and menopause (Mendola, Messer and Rappazzo 2008). A prospective study, which measured exposure to DDT and toxaphene several years prior to breast cancer diagnosis, showed a positive link between exposure to the two pesticides and breast cancer (Cohn et al. 2007). Exposure to DDT before the age of 14 increases the risk of a breast cancer diagnosis later in life (Sutton et al. 2011).

The University of California, San Francisco (UCSF) tested 268 pregnant women to find out what chemicals they had in their blood and urine, and found that 43 out of 163 chemicals tested were present in almost all the women. The presence of the chemicals in the women, who ranged in age from 15 to 44, shows the ability of these substances to remain in the environment and in human bodies, said lead author Tracey Woodruff, director of the UCSF Program on Reproductive Health and the Environment. The study was published in the journal *Environmental Health Perspectives*, and chemicals tested included polychlorinated biphenyls or PCBs, a prohibited chemical linked to

cancer and other health problems; organochlorine pesticides; polybrominated diphenyl ethers, banned compounds used as flame retardants; and phthalates (Woodruff et al. 2011).

Finally, studies from both The National Academy of Sciences and the University of California, Irvine

40% of U.S. children have enough cumulative exposure to pesticides to potentially impact their brains and nervous systems.



showed brain anomalies in children exposed to pesticides. It has been estimated that 40 percent of United States children have enough cumulative exposure to pesticides to potentially impact their brains and nervous systems (Payne-Sturges et al. 2009).

Environmental Health

In addition to conventional agriculture's detrimental effects on human health are numerous adverse effects to the environment. Pesticides contaminate soil, groundwater, and streams (American Public Health Association 2007). Farm policy incentives for producing specific, high-yield plants like corn have led to current agricultural practices such as mono-cropping, which decrease plant biodiversity and leave the soil depleted. Calculations of current rates of soil degradation estimate that the world has lost 70 percent of its topsoil and if current farming methods—which strip carbon—continue, there are about 60 years of topsoil left (Crawford 2015). Current agriculture methods, which strip the soil of carbon and make it less robust cause soil to be lost at between 10 and 40 times the rate at which it can be naturally replenished (ibid.).

On the other hand, organic farming preserves topsoil, protects water supplies, and favorably impacts climate change. A 2013 report issued by the United Nations concluded that organic farming is the only way to feed the growing population and sustain the environment. The report called for the urgent need to return to, and develop, a more sustainable, natural and organic system over one that favors GMOs and mono-cropping. Organic farming reduces pollution of soil and water, and is safer for farmers, farm workers, and the environment (United Nations Conference on Trade and Development 2013).

The world has lost 70% of its topsoil and if current farming methods continue, there are about 60 years of topsoil left.

Industrial agriculture achieves high yields through intensive methods that require large quantities of fertilizers and pesticides, which contaminate soils, groundwater, and streams (American Public Health Association 2007). The U.S. Geological Survey found that 70 percent of domestic and public drinking water well samples to be contaminated with at least one volatile organic compound, pesticide, or nitrate from human sources (Squillace et al. 2002). Fertilizer-derived nutrients from agricultural runoff and pesticides contaminate streams and rivers and have caused “dead zones” downstream, putting fisheries, ecosystems, and economies in danger. Runoff into the Mississippi River has led to a Gulf of Mexico dead zone that in some recent years has been estimated to be as large as the state of New Jersey (Roach 2005).

Heavy treatment of soil with pesticides can cause populations of beneficial soil microorganisms to decline (Aktar, Sengupta, and Chowdhury 2009). This decline of microorganisms deteriorates the quality of the soil and the amount of minerals in it, having a direct effect on the quality and content of nutrients in the food, as seen by the decline in food nutrient content from several studies over the last 70 years.

Donald Davis and his team of researchers from the University of Texas studied U.S. Department of Agriculture nutritional data from both 1950 and 1999 for 43 different vegetables and fruits, finding “reliable declines” in the amount of protein, calcium, phosphorus, iron, riboflavin (vitamin B2) and vitamin C over the past half century. Davis and his colleagues chalk up this



declining nutritional content to the preponderance of agricultural practices designed to improve traits (size, growth rate, pest resistance) other than nutrition (Davis, Epp, and Riordin 2004).

A study of British nutrient data from 1930 to 1980, published in the *British Food Journal*, found that in 20 vegetables the average calcium content had declined 19 percent; iron 22 percent; and potassium 14 percent (Mayer 1997).

Pesticide sprays directly hit non-target vegetation and can also drift from the treated area causing air, soil and non-target plant contamination. Some amount of pesticide drift occurs during every application, including that from ground equipment (Glotfelty and Schomburg 1989).

According to the U.S. Geological Survey, pesticides have been detected in the atmosphere of every area sampled in the United States (Savonen 1997). Almost every pesticide under investigation has been detected in rain, air, fog, or snow in the United States at some point throughout the year (U.S. Geological Survey 1999).





Animal Production: Pasture-raised

Human Health

Numerous studies have shown that pasture-raised beef has less fat and more nutrients than grain-fed beef (Duckett et al. 2009, 2013; Rule et al. 2002). One study compared grass-fed and grain-fed beef, and found that grass-fed beef had lower total saturated and mono-unsaturated fat, more heart healthy omega-3 fatty acids, a lower (and healthier) ratio of omega-6 to omega-3 fatty acids, and higher levels of vitamin E, beta-carotene and B-vitamins than grain-fed beef (Duckett et al. 2009).

Pasture-raised beef has less fat and more nutrients than grain-fed beef.

The results of a new large meta-analysis published recently in the *British Journal of Nutrition* show that organic dairy and meat contain about 50% more omega-3 fatty acids, after carefully analyzing data from more than 200 studies (Srednicka-Tober et al. 2016).

Omega-3 fatty acids are crucial to normal growth and play an essential role in the prevention and treatment of coronary artery disease, hypertension, arthritis, cancer and other inflammatory and autoimmune disorders (Mercola 2015). Numerous health problems have been linked to deficiencies in omega-3 fatty acids, including increased inflammation, depression and violent behavior, diabetes and overweight, allergies and eczema, and memory problems (ibid.).

The “Phospholipase A2 reduction ameliorates cognitive deficits in a mouse model of Alzheimer’s disease” study in *Nature Neuroscience* showed that increased levels of omega-6 fatty acids contribute to erratic behavior and Alzheimer’s disease by interfering with nerve cells in the brain,



causing over-stimulation. The study found that lowering omega-6 levels allows brain nerve cells to function normally (Sanchez-Mejia et al. 2008). The omega-3 fats EPA and DHA also play a key role in emotional well-being and inflammation. A randomized controlled study of 68 medical students showed a 20 percent reduction in anxiety and lower inflammation among participants taking omega-3 fatty acids (Kiecolt-Glaser et al. 2011). Another study demonstrated that women with diets high in omega-3 fats had a 44 percent reduced risk of dying from inflammatory disease compared with women with lower intakes of omega-3s (Gopinath et al. 2011).

The American diet is deficient in omega-3 fatty acids, and has an excessive amount of omega-6 fatty acids compared with the diet on which human beings evolved, and on which our genetic pattern was established (Simopoulos 2002). High amounts of omega-6 polyunsaturated fatty acids (PUFA) and high omega-6/omega-3 ratios, promote cardiovascular disease, cancer, and inflammatory and autoimmune diseases, in comparison to high levels of omega-3 PUFA (a low omega-6/omega-3 ratio), which has suppressive effects (ibid.). In the secondary prevention of cardiovascular disease, a ratio of 4/1 was associated with a 70 percent decrease in total mortality (de Lorgeril et al. 1994). Consuming grass-fed, pasture-raised meats contributes to a lower ratio of omega-6/omega-3 fatty acids, thereby reducing risks of many chronic diseases in Western societies.

An article published in the *British Journal of Nutrition* reported the results of a systematic literature review, which investigated the role of omega-6 fats, omega-3 fats, and trans fats in diet. Researchers found that the risk of non-fatal myocardial infarction (heart attack) was reduced by 27 percent and the risk of death from non-fatal myocardial infarction plus heart disease was reduced by 22 percent with a mixed diet of both omega-3 and omega-6 fats. On the other hand, diets higher in omega-6 poly-unsaturated fatty acids increased risks of all coronary heart disease outcomes by 13 percent (Ramsden et al. 2010).

In addition to the omega-3 benefits of grass-fed meat, choosing certified organic and/or pasture-raised products reduces exposure to antibiotics and artificial hormones, which are administered to conventionally raised animals in confined operations (Hamerschlag 2011). Consuming organic, grass-fed meat also reduces exposure to toxins from pesticides that might accumulate in animal fat from the feed they are given, which often contains pesticides (ibid.).

Pasture-raised meat may also reduce the risk of bacterial contamination (ibid.). Siemon and her team from Ohio State University found the prevalence of fecal *Salmonella* in open-pasture chicken farms to be about half that of conventional farms (16 percent versus 30 percent) (Siemon, Bahnson, and Gebreyes 2007). A similar study, which investigated the distribution of *Salmonella* in organic and conventional broiler poultry farms found that the prevalence of fecal *Salmonella* was lower in certified-organic birds than in conventionally raised birds (5 percent versus 28 percent), and the prevalence of antimicrobial-resistant *Salmonella* was also higher in conventionally raised birds than in certified-organic birds (Alali et al. 2010). Another study showed that grass-fed, pasture-raised cattle carry less *Escherichia coli* (*E. coli*) overall than grain-fed, confined animals, providing further evidence that organically-raised meat is safer than conventionally-raised meat (Russell, Diez-Gonzales, and Jarvis 2000).

Consuming grass-fed, pasture-raised meats contributes to a lower ratio of omega-6/omega-3 fatty acids, thereby reducing risks of many chronic diseases in Western societies.



Environmental Health

In addition to the numerous health advantages from grass-fed beef are environmental benefits. Well-managed grazing and grass-fed operations use fewer energy-intensive inputs and spread manure more evenly by regularly moving animals to fresh pasture and keeping them away from streambeds, thereby increasing quality and quantity of forage growth (Hamerschlag 2011). These methods help conserve soil, reduce erosion and water pollution, increase carbon sequestration and preserve biodiversity and wildlife (Food and Agriculture Organization 2009, Pelletier, Pirog, and Rasmussen 2010). Organic feed production and grazing practices reduce fertilizer and pesticide runoff into waterways, and the use of compost, cover-cropping and rotational grazing contribute to soil health by building healthy, productive and water-conserving soils. In addition, organic practices enhance pest and weed resistance without the use of pesticides, creating greater resiliency in the face of extreme weather and climate change (Hamerschlag 2011).

More research is needed on the net amount of greenhouse gas emissions from grass-fed versus confined-feedlot, grain-fed meat. The climate impact of grass-fed animals depends on a number of factors that vary greatly from one production system to another, including average weight gain and quality of forage, the rate of soil carbon sequestration, and crowding (*ibid.*). Since pasture-raised cattle gain weight on average 25 percent more slowly than grain-fed animals, which are fed high-starch corn feed (Gurian-Sherman 2011), those animals take longer to reach slaughter weight and consequently emit more methane and nitrous oxide.

However, higher emissions may be offset by the carbon sequestration benefits that well-managed pasture systems offer (Pelletier, Pirog, and Rasmussen 2010). Far fewer energy-intensive inputs are used in grass-fed beef production and rotational grazing and the application of organic soil treatments can have a significant impact on carbon building in soil (Follet, Kimball, and Lal 2001).

Choosing grass-fed, free-range organic meats still requires us to decrease overall consumption of animal products—and therefore increase consumption of vegetarian sources of protein—in order to lessen our burden on the environment. Americans eat an average 185 pounds of meat a year, which amounts to more than 8 ounces a day. Reducing consumption of meats to a few days a week, or even to the USDA's dietary guidelines of about 4 ounces per day, would mean a 50% reduction in current meat consumption.



Animal Production: Confined Animal Feeding Operations

Human Health

Concentrated Animal Feeding Operations (CAFOs) are agricultural operations where animals are kept and raised in confined environments. CAFOs congregate animals, feed, manure and urine, dead animals, and production operations on small spaces of land where feed is brought to the animals rather than the animals grazing or otherwise seeking feed in pastures, fields, or on rangeland (Environmental Protection Agency 2015). These unhealthy living conditions result in an unnatural concentration of animals and their waste, creating a need for damaging practices such as the widespread use of antibiotics and storing waste in unsafe outdoor pits (known as lagoons).

Antibiotics given to hogs, poultry, and beef cattle in CAFOs—which compensate for the heightened disease risk from their concentrated living conditions—and feeding grains rather than pasture or grass, are practices of great concern for human health (American Public Health Association 2007). More than 70 percent of all antibiotics used in the United States are administered to livestock (Mellon, Benbrook, and Benbrook 2001). This practice may contribute to the epidemic of antibiotic-resistant infection in humans (Gilchrist et al. 2007) and lead to the contamination of soil and groundwater, because the antibiotics pass through the animals into manure (Sapkota et al. 2007).

More than 70% of all antibiotics used in the U.S. are administered to livestock, contributing to the epidemic of antibiotic-resistant infection in humans.

Antibiotic resistance has become a major clinical and public health problem over the last few decades. Confronted by increasing amounts of antibiotics over the past 60 years, bacteria have responded by reproducing and mutating in a way that they are no longer susceptible to them. Hospitals and communities are seeing cases where microorganisms are not resistant to just one, but to many different antibiotics. The emergence of multi-drug resistance (MDR) is likely related to the quantity of antibiotics and how they are being used (Levy 1998).

The “Antibiotics, Bacteria, and Antibiotic Resistance Genes: Aerial Transport from Cattle Feed Yards via Particulate Matter” study discovered that airborne particulate matter from feed yards facilitated the dispersal of several veterinary antibiotics downwind, as well as microbial communities containing antibiotic resistant genes (McEachran et al. 2015). Many of the bacteria found on livestock (such as *Salmonella*, *E. coli*, and *Campylobacter*) can cause food-borne diseases in humans, and recent evidence strongly suggests that some methicillin-resistant *Staphylococcus aureus* (MRSA) and uropathogenic *E. coli* infections may also be caused by confined animal operations. These pathogens are responsible for tens of millions of infections and many thousands of hospitalizations and deaths every year and lead to a number of diseases that cannot be treated with antibiotics (Gurian-Sherman 2008).

CAFOs cause harm to the rural communities where they are located (ibid.). Foul odors and water contaminated by nitrogen, pathogens and antibiotics negatively affect the health outcomes of residents in these communities. Individuals living near CAFOs suffer from higher rates of respiratory and other diseases compared with rural areas that are not sited near CAFOs (ibid.).



Environmental Health

In addition to adverse effects on human and livestock health, CAFOs in the United States generate over 335 million tons of dry manure waste each year, which is disposed of by applying it to adjacent land to absorb nitrogen and phosphorus (USDA 2005). The disposal of CAFO manure on an insufficient amount of land is environmentally hazardous as it leads to soil saturation, excess run-off, and leaching of waste into surface and groundwater, which has contaminated

CAFOs cause elevated rates of respiratory conditions, including asthma among workers and community members.

drinking water in many rural areas (Gurian-Sherman 2008). A number of manure lagoons have experienced catastrophic failures, releasing tens of millions of gallons of raw manure into streams and estuaries, and killing millions of fish. Run-off and leaching from CAFOs and other animal sources is hypothesized to contribute to dead zones (areas which are devoid of fish) in the Gulf of Mexico, the Chesapeake Bay and other estuaries along the East Coast (ibid.). According

to the Environmental Protection Agency, 55 percent of the nation's river and stream miles do not support healthy populations of aquatic life, due to phosphorus and nitrogen pollution and habitat degradation (Environmental Protection Agency 2013).

Animal agriculture is the largest contributor of ammonia to the atmosphere from the breakdown of manure, urine, and waste animal feed. The substantial majority of this ammonia likely comes from confined animal operations, since the manure deposited by livestock on pasture operations contributes much less ammonia to the atmosphere than manure from CAFOs (Gurian-Sherman 2008). CAFOs emit ammonia, hydrogen sulfide, carbon dioxide, bacterial endotoxins, and microorganisms, which negatively affect air quality and have been shown to cause elevated rates of respiratory conditions, including asthma among workers and community members living near such facilities (Donham et al. 2007). As reported in an American Public Health Association policy statement, "CAFOs contribute to other adverse outcomes for human and ecosystem health from pathogens contained in the waste, including antibiotic-resistant bacteria, dust, arsenic, dioxin and other persistent organic pollutants, antibiotics, and numerous other mixtures of volatile organic compounds" (Burkholder et al. 2007).





Seafood: Safety and Sustainability

Fish are high in nutrients most people are lacking, such as anti-inflammatory omega-3 fatty acids, iodine, and vitamin D, among other important vitamins and minerals. An analysis of 20 studies involving hundreds of thousands of participants showed that eating one to two 3-ounce servings of fatty fish a week—salmon, herring, mackerel, anchovies, or sardines—reduces the risk of dying from heart disease by 36 percent (Mozaffarian and Rimm 2006). With a few exceptions, the benefits of eating fish far outweigh the risks.

Human Health

Fish is a rich source of protein, iron and iodine; provides B vitamins, including B-12; and promotes normal fetal growth and child development. Wild, oily fish are also the richest source of omega-3 fatty acids, which has shown benefits in the prevention and treatment of heart disease, high blood pressure, inflammation, mental health disorders, diabetes, digestive disorders, autoimmune disease, and cancer (University of Maryland Medical Center 2015).

Wild and sustainable seafood are the safest choices for the health of people and planet. The location and living conditions of fish and seafood affect what they eat, their exposure to chemicals, and how much they move, dictating the state of their health and their nutritional profile. Samples of wild Pacific salmon tested at laboratories in British Columbia had eight times more Vitamin D and three times more Vitamin A than farmed Atlantic salmon (Lu et al. 2007).

Wild Pacific salmon has eight times more Vitamin D and three times more Vitamin A than farmed Atlantic salmon.



Unfortunately, even wild fish (namely large fish at the top of the food chain) can have negative health impacts because they may be contaminated with chemicals or mercury. Overfishing is another concern when it comes to wild fish, making it imperative that we examine fishing practices and sustainability when making seafood choices. More than 85 percent of the world's fisheries have been pushed to or beyond their biological limits and need strict management plans to restore them. Several important commercial fish populations (such as Atlantic bluefin tuna) have declined to the point where their survival as a species is threatened (World Wildlife Fund, n.d.). Other threatened species include shark, rockfish (Northeast Pacific fish also known as snapper), Atlantic halibut, and monkfish (Seafood Watch, n.d.).

When considering farmed fish, Closed System Aquaculture is the most sustainable and viable practice currently used to raise species such as tilapia, trout and salmon in Canada, the United States and China. This system can eliminate or significantly reduce water pollution from feed, feces and chemical waste and contamination of the seabed under farms; eliminate escapes from the rearing facility; eliminate marine mammal deaths (no interactions and no nets); eliminate or reduce the risk of disease and parasite transfer to wild salmon; and significantly reduce the need for antibiotics and chemical treatments in raising fish (Coastal Alliance for Aquaculture Reform, 2011).

Fish from farms that do not employ sustainable practices is best avoided (or at least limited). Commercial fish farms can feed rice, corn, soy and vegetable oils such as canola to their fish (National Oceanic and Atmospheric Administration, n.d.). Farmed salmon is also often fed a synthetic form of astaxanthin (made from petrochemicals that are not approved for human consumption) to make their flesh the pink color people expect (Forristal 2003) - unlike wild salmon, farmed salmon has a grayish color. There are also higher levels of polychlorinated biphenyls (PCB), which are potential human carcinogens, in farmed fish (World Health Organization 1999).

The “Global assessment of organic contaminants in farmed salmon” study from Indiana University reported high levels of PCBs in fish feed given to some farmed salmon, and found that farmed salmon from Europe (Norwegian salmon, for example) had about seven times higher PCB concentration than wild salmon (Hites et. al 2004).

Another major concern is exposure to mercury, a toxic heavy metal that can accumulate in fish. Eating fish with high levels of mercury can negatively impact brain development in children and can affect learning and memory function in adults (O'Reilly et al. 2010). Certain fish species are known to have higher mercury concentrations than others, sometimes due to polluted waters. The highest levels of mercury and contaminants tend to accumulate in the large predatory fish at the top of the food chain, such as shark, king mackerel, swordfish, tilefish, Albacore tuna, marlin, sea bass, largemouth bass, red snapper, grouper, bluefish, pike and orange roughy. (University of Michigan 2009).

The “Mercury in Seafood” study by the Environmental Working Group (EWG 2016) found that nearly 30% of women had more mercury in their bodies than the level the EPA considers safe (1 part per million), after testing hair samples from 254 women of childbearing age from 40 states who reported eating as much or slightly more fish than the government recommendations over a period of two months. EWG has advocated for a stricter mercury limit of 0.58 ppm. Dr. Philippe



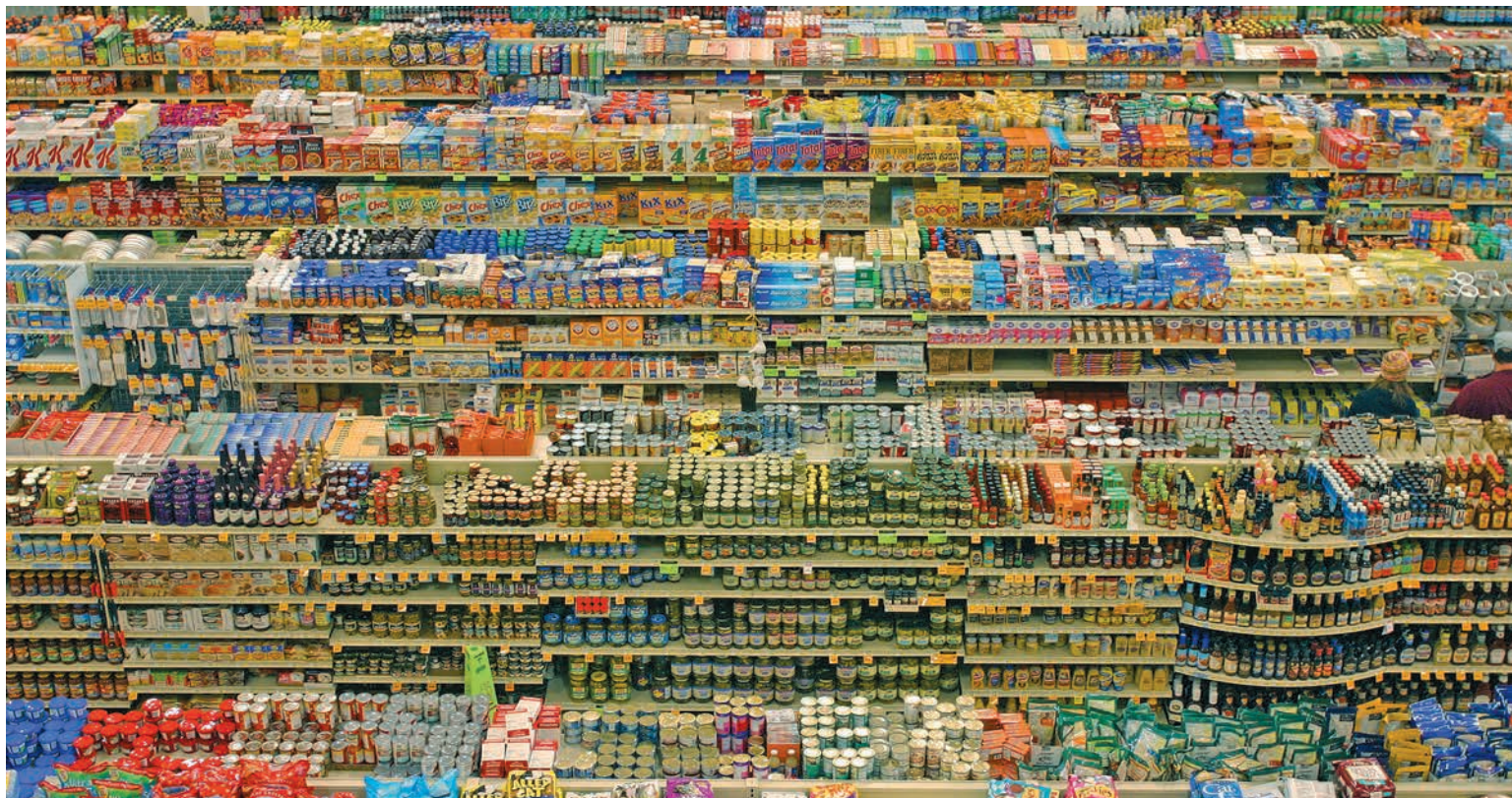
Grandjean, adjunct professor of environmental health at the Harvard T.H. Chan School of Public Health, who tested and analyzed hair samples for EWG's study, saw that almost 60% of the women had more mercury in their system than the EWG's proposed stricter limit (ibid.).

Environmental Health

Environmental concerns with farmed fish include sea lice from farms infecting young wild salmon; diseases such as infectious salmon anaemia and bacterial kidney disease occurring in farms requiring the application of vaccines and antibiotics which can pass into the surrounding environment; marine mammal deaths from open-net cages; marine debris such as lost fish-farming equipment; algae blooms in surrounding environment from excessive nutrient loading in farms; escapes and alien species out-competing wild salmon for habitat and food and spreading disease and pathogens to wild fish; and concerns with the fish feed, namely foods not meant for seafood, antibiotics, and synthetic agents (Coastal Alliance for Aquaculture Reform 2011).

Concerns for wild seafood include whether the fish was caught using practices that protect habitat and other wild life or destroy it. Best practices include hook and line, hand line, troll, jig and spear gun. Harmful techniques include bottom trawling, an industrial method which uses enormous nets weighed down with heavy ballast which are dragged along the sea floor, raking up or crushing everything in their way, from fish to ancient coral; bycatch, which refers to all the forms of marine life caught unintentionally while catching other fish; and poison and explosives, which is actually very common, in both fresh and salt water, including coastal lagoons and coral reefs (Seafood Watch n.d.).





Processed Foods

Refined Sweeteners

A growing body of epidemiological evidence demonstrates that excessive sugar consumption affects human health more than simply adding calories (World Health Organization 2015). Scientific evidence shows that fructose can trigger processes that lead to liver toxicity and a number of other chronic diseases (Lustig 2010). Sugar induces all of the diseases associated with metabolic syndrome, including hypertension; diabetes from increased liver glucose production combined with insulin resistance; high triglycerides and insulin resistance through synthesis of fat in the liver; and accelerated ageing process, caused by damage to lipids, proteins and DNA through nonenzymatic binding of fructose to these molecules (Lustig 2010, Lustig, Schmidt, and Brindis 2012).

Furthermore, numerous studies have shown the dependence-producing properties of sugar in humans (Garber and Lustig 2011). Sugar has an addictive property and a similar effect on the brain to tobacco and alcohol, encouraging subsequent intake (Lustig, Schmidt, and Brindis 2012).

The United States Department of Agriculture (USDA) recommends that the average person on a 2,000-calorie daily diet include no more 40 grams of added sugars, which is equivalent to about 10 teaspoons, or the amount of sugar in a 12-ounce soft drink. However, according to the CDC, the average American adult man consumes 84 grams a day, and average woman 60 grams of sugar a day (2013). Sadly, adolescents (aged 12 to 19 years old) consume even more added sugar, with boys consuming 110.5 grams a day and girls 78.5 grams (CDC 2012).

Among many nutrition professionals, the maximum recommendation of 40 grams a day for added sugar has been considered too high, and now the World Health Organization (WHO) has agreed,



announcing that it is cutting its recommended added sugar intake in half, from the original 10 percent of total daily calories to five percent. For a normal-weight adult, that's about 20-25 grams, or 5-6 teaspoons, per day (WHO 2003).

It is very important to make the distinction between added sugars and sugars that occur naturally in foods like fruits and vegetables. Added sugars are those that are added to foods, including brown sugar, corn sweetener, corn syrup, dextrose, fructose, glucose, high-fructose corn syrup, honey, invert sugar, lactose, malt syrup, maltose, molasses, raw sugar, sucrose, trehalose, and turbinado sugar (USDA 2016).

Excessive sugar consumption costs the United States \$65 billion in lost productivity and \$150 billion in health-care resources each year on morbidities associated with metabolic syndrome. In fact, fully 75 percent of all health care dollars in the United States are spent on treating diseases and disabilities exacerbated by sugar consumption (Lustig, Schmidt, and Brindis 2012).

75% of all health care dollars in the United States are spent on treating diseases and disabilities exacerbated by sugar consumption.

According to the National Cancer Institute (2005), “On any given day, half the people in the United States consume sugary drinks; 1 in 4 get at least 200 calories from such drinks; and 5 percent get at least 567 calories—equivalent to four cans of soda. Sugary drinks (soda, energy, sports drinks) are the top calorie source in teens’ diets (226 calories per day), beating out pizza (213 calories per day).”

Studies have found that: 1) people who consume sugary drinks regularly—1 to 2 cans a day or

People who consume sugary drinks regularly have a 26% greater risk of developing type 2 diabetes.

more—have a 26 percent greater risk of developing type 2 diabetes than people who rarely have such drinks (Malik et al. 2010); 2) that men who averaged one can of a sugary beverage per day had a 20 percent higher risk of having a heart attack or dying from a heart attack than men who rarely consumed sugary drinks (de Koning et al. 2012), with similar results

for women (Fung et al. 2009); 3) that women who consumed a can a day of sugary drink had a 75 percent higher risk of gout than women who rarely had such drinks (Choi, Willett, and Curhan 2010), with similar results in men (Choi and Curhan 2008) ; and 4) that the consumption of sugar-sweetened beverages is an important predictor of cardio-metabolic risk in young people, independent of weight status (Malik et al. 2010). Added sugars consumed in other forms—such as in processed and packaged foods—have similar health impacts.

While sugar’s primary negative impact is on human health, our addiction to sugar also contributes to a number of environmental issues. Cultivation of cane and beet sugar contributes to soil degradation by increasing rates of erosion and soil removal at harvest thereby impacting soil quantity and soil quality (World Wildlife Fund n.d). Erosion in particular is a considerable issue in tropical areas, because erosion rates in tropical agroecosystems are usually greater than the rate of soil formation. These practices affect future yields and limit the sustainability of sugar cultivation by removing soil organic matter and nutrient-rich material (ibid.). Worldwide estimates of soil loss from water erosion range from 37 to over 1,235 acres per year, and soil loss



from wind-generated erosion range from 13 to 49 tons per acre per year in the United States alone. These rates are much higher in the European Union where estimates of soil loss from beet farms are at three million tons annually (ibid.). Soil erosion also poses a significant threat to the environment from polluted sediments that make their way into estuaries, rivers and marine ecosystems.

The production of sugarcane is probably responsible for a greater loss of biodiversity on the planet than any other single crop.

The production of sugarcane is probably responsible for a greater loss of biodiversity on the planet than any other single crop (Cheesman 2004). Emissions, solid waste and run-off from sugar mills and their processing by-products have resulted in the suffocation of freshwater biodiversity, leading to massive fish kills, especially in tropical rivers that are already naturally low in oxygen (World Wildlife Fund n.d.). Significant areas of biodiversity-rich habitat have been

cleared for cane cultivation, such as tropical rain forest and tropical seasonal forest, resulting in the direct loss of species and habitats, and also a range of wider impacts on ecosystem function, including hydrology changes and increased soil erosion (ibid.).

Sugar cane, sugar beet and corn/maize (used to make high fructose corn/maize syrup), use a substantial amount of water (Gerbens-Leenes and Hoekstra 2009), ranking among a group of crops noted for their significant water consumption (World Wildlife Fund n.d). Further cause for ecosystem health arises from the wide variety of pesticides used in the cultivation of sugar crops as herbicide use in sugar beet is among the highest compared to other crops (ibid.).

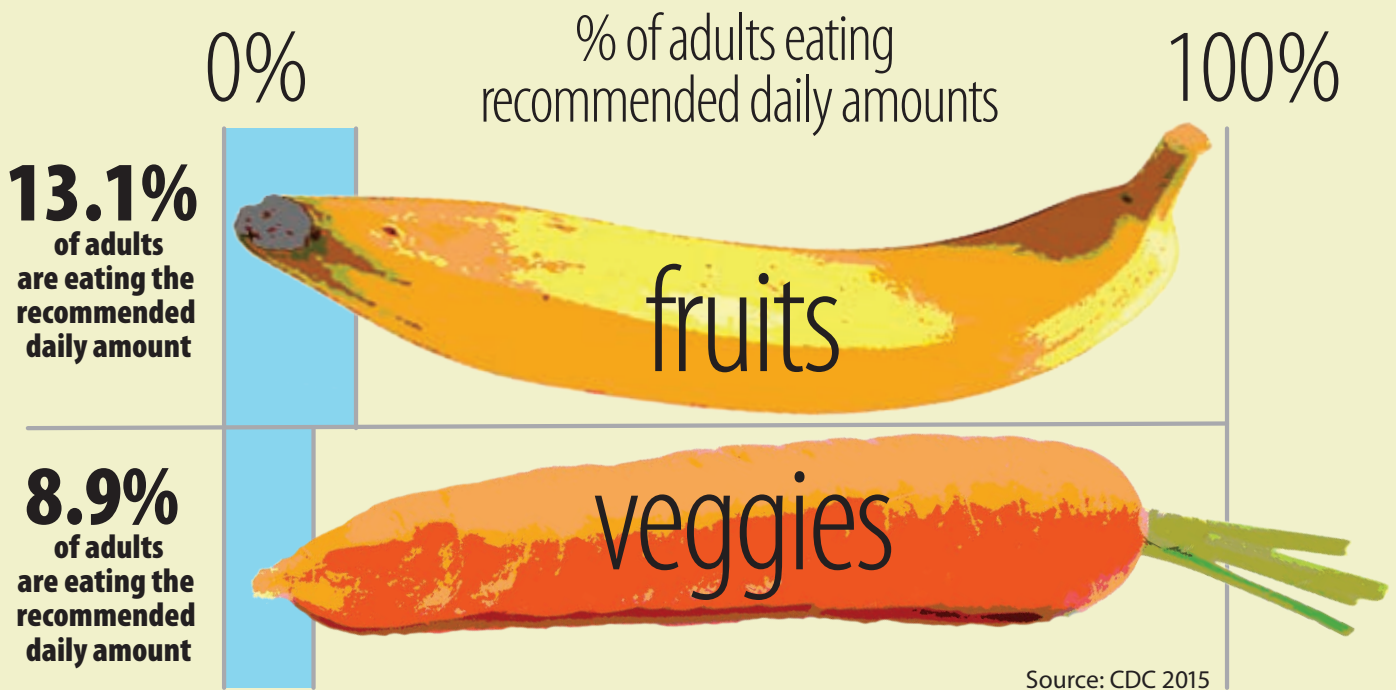
Food Additives

Highly processed foods—soda, cookies, chips, white bread, prepared meals—make up more than 60 percent of the calories in the foods we buy, according to an analysis of grocery purchases in the United States from 2000 to 2012 (Federation of American Societies for Experimental Biology 2015). Meanwhile, research shows that consuming nine servings of fruits and vegetables leads to a 40% overall reduction in mortality. The problem is, if we are consuming 60% of our calories from processed foods, we are not getting the amount of unprocessed foods we need. In fact, during 2007–2010, half of the total United States population consumed less than one cup of fruit and less than 1.5 cups of vegetables daily; 76% did not meet fruit intake recommendations, and 87% did not meet vegetable intake recommendations (CDC 2015).

Over 10,000 additives are allowed in food, including those that are added directly and those included in packaging (Mercola 2015). Food additives are used to improve taste, texture and appearance, slow spoilage, prevent fruits from turning brown, prevent oils and fats from going rancid, and to fortify foods with synthetic vitamins and minerals to replace those lost during processing (ibid.).

Food additives are not required to obtain pre-market approval by the United States Food and Drug Administration (FDA) if they fall under the “generally recognized as safe” (GRAS) designation (FDA 2015). The FDA defines ‘safe’ as “a reasonable certainty in the minds of competent scientists that the substance is not harmful under the intended conditions of use” (ibid.). Companies may hire a scientist or industry insider to evaluate the chemical, and if that individual deems the





additive to meet federal safety standards, it can be deemed GRAS without further testing (Mercola 2015).

Under these policies a number of food additives have been approved that have later been shown to have detrimental effects on human health. Nine of the food dyes currently approved on the market in the United States cause adverse health outcomes that range from cancer and hyperactivity to allergy-like reactions (Kobylewski and Jacobson 2010).

Nine of the food dyes currently on the market cause adverse health including cancer.

The “Identification of xenoestrogens in food additives by an integrated in silico and in vitro approach” study from the Chemical Research in Toxicology journal found 31 potential estrogen-mimicking food additives on the market (Amadasi et al. 2009). Estrogen-mimicking compounds mimic the effects of endogenous estrogen and can cause a number reproductive disorders. Propyl paraben is one of the many endocrine-disrupting chemical that causes adverse health outcomes (Mercola 2015). In 2006, the European Union removed propyl paraben from its list of safe food additives due to its potential health hazards (ibid.); however, it is still found in a number of brand-name foods in the United States including tortillas, muffins, cakes and food dyes (Meister 2015). Ninety-one percent of Americans have propyl paraben in their urine (Mercola 2015) and tests on beverages, meat, dairy products and vegetables sold in the United States found the chemical in about 50 percent of samples (Environmental Working Group 2015). Propyl paraben has been shown to impair fertility in women, reduce sperm counts and testosterone levels in men (ibid.) and is linked to estrogen-sensitive cancers like breast cancer (Mercola 2015). Propyl paraben has also been shown to alter hormone signaling and gene expression, which is of particular concern for children during critical times of development, both before and after birth, as it can affect their reproductive, neurological, and immune systems (ibid.).

Other food additives that have been shown to have adverse health outcomes include: nitrates and nitrites, potassium bromate, butylated hydroxyanisole (BHA), butylated hydroxytoluene (BHT),



propyl gallate, theobromine, secret flavor ingredients, artificial colors, diacetyl, phosphate food additives and aluminum additives (Environmental Working Group 2015). Aluminum additives, which are found in processed foods as stabilizers, accumulate and persist in our bodies, especially in bones, and can cause neurological effects, including changes in behavior, learning and motor response (Mercola 2015). There may also be a link between aluminum exposure and Alzheimer's disease and other neurodegenerative disorders (Jansson 2001).

Food packaging also includes many chemicals that have adverse effects on human health, including bisphenol-A (BPA), bisphenol-S (BPS) and phthalates. Bisphenol-A is found in plastics, canned goods, reusable food containers, plastic wraps, water bottles and a number of personal care products (Mercola 2015). Bisphenol-A mimics estrogen and causes a number of health concerns, including structural damages to the brain, hyperactivity, increased fat formation and obesity risk, and altered immune function (*ibid.*). BPA is an ovarian toxicant, and strong evidence suggests it is a uterine toxicant because it impairs uterine endometrial proliferation and decreases uterine receptivity (Peretz et al. 2014). Research also implies BPA exposure is associated with adverse birth outcome, hyperandrogenism, sexual dysfunction and impaired implantation and may also be a testicular toxicant in humans (*ibid.*).

Many manufacturers have switched from using BPA to BPS. However, BPS may be just as harmful, if not more so, as BPA (Mercola 2015). Cheryl Watson at the University of Texas Medical Branch discovered that minute concentrations of BPS might disrupt cellular function, which can lead to metabolic disorders such as obesity, diabetes and even cancer (2013). A systematic review of 32 studies examined the hormonal activities of BPS and found its potency to be in the same order of magnitude and similar action to BPA (Rochester and Bolden 2015). Researchers also found that BPS has similar potencies to estradiol in membrane-mediated pathways, which control cellular actions including proliferation, differentiation and death, meaning that BPS affect the cell's ability to perform specific functions and can influence mutation and multiplication, which can ultimately lead to a cancer cell (*ibid.*).

Phthalates are used as plasticizers and can be found in food additives (Mercola 2015). Phthalates have numerous adverse health effects including the feminization of males of all species, disturbed lactation, early or delayed puberty, hormonal disruptions and breast and testicular cancers (*ibid.*). Phthalate concentrations in biological samples in male adults showed increased sperm DNA damage, decreased sperm motility, decreased sperm morphology and decreased sperm concentration (Hauser et al. 2003, 2007; Duty et al. 2003a, 2003b; Zhang et al. 2006).



Trans Fats

Artificial trans fat can be found in a variety of processed foods including crackers, cookies, cakes, fried foods, and packaged dinners, and is usually listed in the ingredients as hydrogenated or partially-hydrogenated oil. Trans fat is made by adding hydrogen to vegetable oil through a process called hydrogenation, which changes the molecular composition of a natural oil, creating something that our bodies cannot easily recognize or process. Studies now show that trans fat raises our “bad” cholesterol (LDL) and reduces our “good” cholesterol (HDL), among other harmful effects (Katan, Zock, and Mensink 1995). Unfortunately, in the United States, if a food has less than 0.5 grams of trans fat per serving, the food label can read 0 grams trans fat, which is very misleading, especially when the “suggested” serving size is much smaller than what people are likely to consume.

Decades of research have found that consuming artificial trans fat is strongly linked to heart disease and obesity. In a recent meta-analysis of 72 studies on fat, the results showed no link with cardiovascular disease, except in the case of trans fats (Chowdhury et al. 2014).

Consuming artificial trans fat is strongly linked to heart disease and obesity.

The FDA has set a 2018 deadline for food companies to eliminate artificial trans fat from their products. In the meantime, the CDC has estimated that the 25 percent of trans fats still found in the American food supply account for approximately 7,000 premature deaths a year (Dietz and Scanlon 2012).

The Standard American Diet not only contains trans fats in its processed products, but it simultaneously emphasizes low-fat products, so we are not only consuming too much unhealthy fat, we are not getting enough healthy fats.

The key to chronic disease prevention and weight loss is the quality and sources of fats more than their relative quantity in the diet.

Over the past 30 years in the United States, the percentage of calories from fat in people’s diets has gone down while obesity rates have skyrocketed (Willett and Liebel 2002). The fear of saturated fats that has plagued our culture for the last 30 years has created an under-insulated, over-sugared, nutrient-starved population, while the use of trans fats has been silently accepted, at least until recent years. Evidence now

shows that the key to chronic disease prevention and weight loss is the quality and food sources of fats more than their relative quantity in the diet (ibid.).

Quality fats such as olive oil, avocados, nuts, seeds, oily fish and grass-fed animal fats should be prioritized over vegetable oils and industrial spreads (eg. margarines, butter substitutes, and shortening).



Conclusion

Our commitment to having the most positive impact on the people we serve and the land, water and air that sustains us has led Ceres Community Project to prioritize organic, sustainably grown and local food sources. As the above research points out, it is time for a shift in our thinking, our practices and ultimately our food system. High quality organic foods cannot be considered a luxury for a few. They must become the best practice standard if we are to ensure the best health for all today, as well as a healthy future for ourselves, our community, our children, and our planet.

Moving to a healthy and sustainable food system will take leadership, creativity and commitment. It starts with understanding the impact of the choices we make each day, sharing this information with people in our organizations, and identifying steps that we can take. Each step we take is cause for celebration and helps build momentum for positive change across the food system. Please join us!

“We know creating a new sustainable food system will not be quick or easy, but we also know it is not optional; it’s a necessity. Admittedly, there may be no logical reason to be optimistic about our success. But, we know that thousands, perhaps millions, of people all around the world are working and trying new things that could make it happen. In their work, there is hope. We know that working to bring about change is the only thing that makes sense, regardless of how it turns. In all of these things there is hope. Finally, even if in the end we fail, while daring greatly, always remember: Life is simply too precious to live without faith, without love, and finally, without hope.”

*John Ikerd, Professor Emeritus,
Agricultural Economic, University of Missouri*





About Ceres Community Project

Since 2007 Ceres Community Project has been focused on creating better health for the people we serve, the communities where we operate, and the planet that supports us. We believe, and research supports, that these are intricately connected. Our health depends on the quality of the food we eat – and that food quality depends on a healthy environment. Our well-being and vitality rest in the strength and support of our connections with one another. And our ability to feed and care for future generations requires that we produce food today in a way that builds the health of our soil, water and biome rather than depleting it.

Ceres' mission is to create better health for people, communities and the planet through love, healing food and empowering the next generation.

Through several interconnected programs, Ceres provides 100,000 organic whole food meals a year, along with nutrition education and caring support, to community members who are too sick to shop and cook for themselves. All of those meals are prepared by youth ages 14 to 22 through a youth development program that teaches young people about growing, cooking and eating healthy food; the connection between food, health and the environment; life, work-ready and job skills; leadership and the power of giving back. Adult volunteers play a significant role, strengthening community connections even further and spreading the organization's message about healthy eating.



www.CeresProject.org

Ceres operates several program sites in the San Francisco Bay area, and through its National Affiliate Program has trained eleven communities across the United States to replicate its model.

At Ceres, we are committed to having our work create the greatest positive benefit. To support that goal Ceres sources and uses only food that is organic/sustainably raised, whole, pastured, antibiotic free, and free of chemicals or additives. We also focus on purchasing from local farms and producers whenever possible in order to reduce our carbon footprint and help build a resilient local food system.

Of highest priority to the health of those we serve is reducing sugar sweetened foods, trans fats and processed foods, and replacing those with fresh fruits and vegetables, healthy fats, whole grains and legumes. These foods have preventive benefits against type 2 diabetes, heart disease and stroke, autoimmune diseases, mental illnesses, and many types of cancers. We gathered some of the research documenting these benefits in a white paper published in 2014 entitled “Ceres Food Philosophy: Why and How.” Moving beyond the critically important step of providing a whole foods diet, we are committed to serving organically raised foods because of the increased nutritional benefits they provide, a factor that is especially important for those who are ill, children, the elderly, and any populations under stress. Organically raised foods also provide other important benefits that impact health. These include healthier soils, clean water and air, and the ability to sequester carbon to help mitigate the impacts of climate change.

While committing to this food philosophy means higher food costs for our programs, we believe strongly that this is a critical upstream investment that pays important dividends for the health of the individuals and communities that we serve today while also insuring that same level of health is available in the future. Through this paper, we hope to inspire and support our colleagues in improving the health and sustainability of the food they source and provide to their clients so that collectively we can insure a healthy future for all.



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Preparing food
is not just about
yourself and others,
it is about everything.

~ Shunryu Suzuki

Ceres Teen Chefs preparing an hors d'oeuvre they call Heart Beets.