

GOODFOOD

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A Vision for “Good Food” for Public Health

Linking Sustainable Food Systems to Healthy People & Healthy Communities

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An Ecological Approach to Food & Health

Food - it is a basic human need and the quality, quantity and biodiversity of food available is essential to public health.

The World Health Organization defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (1). The health of the population is reflective of the health of the food system. The foundation of a sustainable community-based food system is built on healthy and diverse natural resources. Science proves that healthy soil grows healthy food. Science also proves that eating healthy food nourishes healthy people and healthy people form healthy communities. Therefore, when the soil is

unhealthy it becomes the source of disease in plants, animals and people.

Author and farmer Wendell Berry said “eating is an agricultural act” (2) and agriculture is central to the US economy, culture and communities. Yet, people are often disengaged from food production and may know little of how the current industrial food system impacts health. This disconnection to food production correlates with rising chronic disease trends and public health disparities. Changes within the food system are needed to assure all people have access to good food - food that is healthy, green, fair, affordable, and accessible (3).

Regardless of the area of practice, public health practitioners can be key partners when

reconnecting people to the food system. A “Good Food” system is a sustainable community-based food system that focuses on the relationships between farmers, processors, distributors, retailers and eaters. There is an emphasis on locally-grown food, economic development, sustainability, resource conservation, health and social equity (4). When local food production is integrated within a community, food becomes a community asset. As access to locally-grown food increases, food security improves, more fruits and vegetables are consumed and diet-related chronic diseases decline.

The time is ripe for public health practitioners to commit to a vision of good food and support a sustainable food system by cultivating a food landscape that supports the health, social and economic well-being of individuals, families, farms and communities.

Healthy soil and healthy food can be the next public health achievements!

Snapshot of the Food System

When was the last time you thought about where food really comes from? Or how far food has traveled before it reaches your plate? Or the energy it takes to produce, process, package and transport food? Have you considered how agriculture policy affects the quality, biodiversity and cost of food or how it impacts the health of families and communities? How will the current food system determine the viability and stability of the food supply for future generations?

Regular access to fresh, healthy food is critical for all people to follow a healthy diet. People who have limited access to fresh, healthy food are at greater risk of developing diet-related chronic diseases. As the price of healthy foods increases, it will be more challenging for all eaters, especially those with income restraints, to maintain a diet consistent with the Dietary Guidelines for Americans. This is particularly true in rural and low-income communities.

To gain a broader understanding of how an industrialized food system impacts public health, each sector of the food system must be evaluated.

Agriculture

Rapid advances in genetic engineering has increased the number of crops that produce drugs, hormones and industrial chemicals. These non-food crops run the risk of cross-pollinating or co-mingling with food crops (5,6) increasing the vulnerability of the food chain.

Current agriculture does not meet the food and nutrition needs of the population. The US does not grow enough of the key foods for a healthy diet. If all people were to eat according to the Dietary

Guidelines for Americans, significant acres of land would need to be converted from corn and soybean production to fruit, vegetable and dairy production (7).

The US has developed a greater reliance on other countries to produce food. In the last ten years, imports of fresh produce have doubled with most of the fresh produce imported from Central and South America (8).

The commoditization of agriculture has reduced the biodiversity of foods. The loss of biodiversity negatively affects the ecosystem and narrows the variety of food consumed by animals and humans. With more than 7,000 species of plants available for food, wheat, rice and corn account for 60% of the total caloric intake in the human diet (9). As the diversity of food crops decreases, rates of poor health increases (10).

Industrial agricultural crops do not develop to their full nutrient potential due to hybridization, depleted soil nutrients, plant spacing, and harvested prior to peak ripeness (11,12).

Each year in the US, about 25 million pounds of antibiotics are given to livestock for non-therapeutic purposes. This is eight times more than prescribed to humans to treat disease (13). Antibiotics are used with livestock that are raised in confinement facilities in an effort to control the spread of disease and to promote growth (14). The FDA states the use of antibiotics in livestock causes microbes to become resistant to drugs used to treat human illness, making some human illnesses harder to treat (15).

Poor fisheries management has depleted 75% of the world’s fish stocks (16) and it is projected that all fisheries will be 90% depleted by 2050 (17).

Commercial aquaculture poses environmental concerns such as non-therapeutic use of antibiotics, waste discharge, and destruction of mangrove swamps.

Environmental Health & Natural Resources

More than 675 million pounds of pesticides were applied to crops in the US in 2002 (18). Human exposure to pesticides can come through direct exposure by farmers and farm workers, residue in food (on or in fruits and vegetables or in meat such as fish and livestock), contaminated drinking water or in the air. Because pesticides bioaccumulate higher up on the food chain, foods such as meat, milk, cheese and eggs increases exposure to pesticides as they accumulate in fat cells (19). The public health costs of pesticides are estimated to be over \$1 billion per year (20).

Much of the soil has been lost to erosion. In the Midwest, an average of seven tons of soil per acre are lost per year due to erosion (21). In 2008, parts of the Midwest lost as much as 56 tons of soil per acre (22). When soil is lost, vital nutrients and

Snapshot of the Food System (continued)

microorganisms are lost resulting in plants with depressed nutrient profiles (23) or the inability to grow food.

Agricultural runoff includes chemicals, pharmaceuticals and animal waste. The runoff contaminates streams and rivers and is linked to the dead zone in the Gulf of Mexico destroying fisheries, ecosystems and economies. Animal wastes may contain antibiotic-resistance bacteria, arsenic, dioxin, antibiotics and other volatile organic compounds (24,25).

Approximately 18% of all greenhouse gas emissions come from industrial livestock production (26).

Glacial aquifers are being quickly depleted as a result of extensive agriculture irrigation of feed crops for livestock. It is estimated that for each kilogram of grain-fed beef, it requires more than 100,000 liters of water (27).

With the increased demand for biofuels and ethanol production, a competition has begun between crops for food and crops for industrial energy production. The competition over cropland may have a multiplier affect and increase food prices and further perpetuate hunger and food insecurity across the US.

Food Production & Energy

Production, processing and retail markets are very concentrated. Four companies provide the majority of the commercially available seed in the world; three companies trade most of the grain that moves between countries; four companies control almost 85% of the beef packing industry; four companies control more than 66% of the pork

packing market; and four companies control 80% of the soybean crushing business (28).

Researchers have found the greater distance an individual must travel to purchase fresh, healthy food, the greater the rates of diet-related chronic diseases (29).

Modern diets are heavily dependent on nonrenewable fossil fuels. For example, for every 100 calories of vegetables, 50 calories of fossil fuel energy is needed. Likewise, every 100 calories of chicken requires 500 calories of fossil fuel energy. For every 100 calories of grain-fed beef, 1,600 calories of fossil fuel energy is needed (30,31).

Using a life cycle energy analysis, a diet high in processed and packaged foods requires much more energy for production than a fresh, locally-grown diet (32).

Retailing and Consumption

In 2006, more than \$947 billion was spent on food in the US. On average, households spend 10% of their income on food. This is compared to 20% of household income spent on food in 1950 (33,34).

In 2006, more than 20,000 new food products were introduced in supermarkets with 54% being candy, gum, snacks and beverages (35).

Five supermarket chains reported almost \$250 billion in grocery sales which accounted for 48% of all supermarket sales in the US (28). Wal-Mart is the largest food retailer in the world with \$312 billion in revenue in 2006 (28).

Food deserts are areas in which supermarkets have closed in urban and rural areas and convenience stores and fast food restaurants become the only outlets for food, thereby decreasing access to fresh, healthy food (36,37).

What is "Good Food?"

Healthy

- Dietary guidance is based on good food principles
- Food does not incur disease
- Health care costs attributed to diet-related diseases are minimal
- Nutritional value of food is maintained and food is free of artificial ingredients

Green

- Food is produced with no or low environmental impact
- Food is grown in a balanced ecosystems
- Non-renewable energy is minimal to produce and distribute food
- Wastes are recycled

Fair

- The food system does not exploit anyone or anything
- Farmers are economically self-sufficient
- Local food systems are economically vibrant
- Farm, restaurant and other food workers receive a livable wage

Accessible & Affordable

- All people have equal and regular access to fresh, safe, nutritious, seasonal and sustainably-produced food to maintain a healthy lifestyle
- Individual, household and community food security is maximized

Snapshot of the Food System (continued)

Americans are eating 523 more calories per day (38) and are consuming 1000% more refined sugars such as high fructose corn syrup since 1970 (39).

Refined sugars (e.g., high fructose corn syrup), grains and added fats are subsidized agricultural products which enables food manufacturers to produce inexpensive food. This creates an inverse relationship between the energy density of foods (calories per gram) and energy cost (dollars per calorie) resulting in diets based on refined grains, added sugars, and added fats that are cheaper than a diet based on fresh fruits and vegetables, lean meats and fish (40). Cheaper foods are often highly processed, calorie dense and nutrient deficient and contribute to diet-related chronic diseases.

Demand for local, sustainable, humanely-raised, fair-trade food production has increased with the organic food industry growing about 20% each year (41).

Health Status

More than 11% of households in the US do not have regular access to safe and nutritious food, and almost 4% of households were hungry or experienced very low food security (42). The economic cost of hunger in is estimated to be \$90 billion annually (43).

Healthy eating can help reduce the incidence of obesity and diabetes – increasingly common conditions that result in shortened lives, lowered productivity, and enormous economic costs (44).

The direct costs attributable to obesity are estimated to be more than \$92.6 billion in 2002, of

which about half of these costs were paid by Medicaid and Medicare (45).

More than 23 million adults have diabetes with 1.6 million new cases of diabetes diagnosed in 2007. Type 2 diabetes rates were greater in children aged 10 to 19 years as compared to younger children with higher rates among US minority populations (46).

The number of children who are overweight has tripled in the last 30 years (47). Almost a third of low-income children between two and five years of age are overweight or at-risk of being overweight (48).

Researchers have predicted that because of the dramatic rise in obesity and related chronic diseases, especially among young people, the US may witness a decline in life expectancy by as much as five years over the next few decades. Today's children may have a shorter life spans than their parents (49).

The highest rates of obesity and diabetes are among people who live in lower-income communities and have deteriorated food environments. However, for people living in lower-income and higher-income communities alike, the higher the ratio of fast-food restaurants and convenience stores to grocery stores and produce vendors near home, the higher the prevalence of obesity and diabetes (44).

According to a survey conducted by the Leopold Center for Sustainable Agriculture, 69% of respondents “somewhat” or “strongly” agreed that local food is better for their personal health than food that has traveled across the country (50).

What is a Community-Based Food System?

The CS Mott Group for Sustainable Food Systems at Michigan State University developed a community-based food systems model to demonstrate the interconnectedness of how food is produced, processed, transported, purchased, prepared and consumed. The inner ring, or food system sectors, influences the many outcomes identified in the outer ring.

The community-based food system model frames the “circle of connections” to enable public health practitioners to communicate the relationships between health, economic development, natural resources and social well-being. The model can be used to initiate a dialog with local policy makers and as a framework for creating a community food profile as a supplement to a community health needs assessment and health improvement plan. For more information go to www.mottgroup.msu.edu.



Public Health Benefits of Sustainable Food Systems

Food choices made today affect the health of individuals, and profoundly influence the Earth's capacity to grow healthy, fresh food in the future. The public health benefits of sustainable food systems extend beyond single nutrients to establishing vibrant and resilient communities that can be maintained indefinitely. The public health benefits of sustainable food systems include:

Provides Fresh, Flavorful Food. Foods grown closer to the point of consumption provide a fresh, ripe and flavorful product. Because local produce is picked when ripe, there is a more robust flavor profile as compared to produce that was picked before it was ripe and traveled thousands of miles.

Decreases Chronic Disease. A diet rich in fruits and vegetables maximizes good health. Increased fruit and vegetable consumption substantially lowers the risk of developing obesity, diabetes, heart disease and could prevent at least 20% of all cancers (51), thereby reducing health care costs.

Promotes Healthy Child Development. Providing fresh, whole foods to all children and pregnant women are building blocks for healthy child development and optimal health. Farmers market nutrition programs, farm to school initiatives and school gardening curriculum restores the connection between children, food, land and place and is the basis for healthy child development.

Boosts Beneficial Nutrients. Some studies show that organic farming produces crops with higher levels of beneficial nutrients, such as antioxidants, as compared to conventionally-grown crops (12). Pasture-raised, grass-fed beef contains less total fat than meat from grain-fed animals. Meat and milk from pasture-raised, grass-fed animals contain greater levels of beneficial fatty acids such as omega-3, alpha-linolenic acid and conjugated linoleic acid (52).

Increases Diversity of Foods. Diverse foods are needed to meet the food, nutrition and health needs of every person. Diversifying farm products helps meet that demand and enables a producer to spread out their production and level of risk. Diversity in production systems and natural

ecosystems increases the diversity of diets and the prospect of a sustainable future (53).

Strengthens Food Security. Linking fresh, local foods to nutrition assistance programs may decrease food insecurity and hunger and improve the health of low-income families. With more farmers' markets available, families have greater access to locally-grown fresh produce. This increases the supply of fresh, local food to low-income families who may have higher rates of diet-related chronic diseases. In the event conventional food distribution channels are disrupted in, local food sources should be incorporated into emergency preparedness plans. Sustainable food systems strengthen individual, household and community food security.

Establishes Relationships. Local foods enable people to reconnect with where their food comes from and how it is produced by establishing personal relationships with farmers. Preparing and eating local foods at home provides opportunities for families to share quality time contributing to better connected families and communities.

Protects Animal Welfare. In sustainable agriculture, animals are raised on a scale such that they can be treated humanely and with compassion and so that they do not endure unnecessary suffering.

Decreases Widespread Contamination. Local production, processing and distribution systems have shorter supply chains and offer less comingling of products as compared to a global industrial food system. This decreased vulnerability allows potential food contamination to be contained.

Improves Economic Viability and Stability. People are seeking higher quality, fresh, healthy foods from farmers who implement responsible agricultural practices. This demand will result in greater financial opportunities for farmers. This revenue will be recirculated and reinvested within communities and will strengthen local economies (54). For example, a study from the Leopold Center for Sustainable Agriculture found that if Iowans ate five servings of fruits and vegetables per day, and Iowa farmers supplied that produce for three months of the year, production and marketing for these additional crops would add

What is a Sustainable Food System?

A sustainable and resilient food system conserves and renews natural resources, advances social justice and animal welfare, builds community wealth, and fulfills the food and nutrition needs of all eaters now and in the future (55).

\$302.4 million and 4,094 jobs to the Iowa economy (56).

Offers More Stable Farm Incomes.

People are more likely to purchase locally-grown foods if available (57). This demand, if matched by local production, may enhance the farmer's share of the final retail price as there are fewer exchanges between farmer and consumer. Stable farms are the cornerstone of rural communities.

Saves Farmland. Community-based food systems will slow the rapid loss of farmland to residential and commercial development. States can establish sustainable communities centered around profitable local food production.

Preserves Natural Resources. As Sir Albert Howard said in 1939, "soil is the basis of public health" A sustainable food system includes diversified farming systems which renews the soil and regenerates natural resources by maintaining soil nutrients, reducing dependence upon chemical pesticides and fertilizers, promoting crop diversity, decreasing erosion and preserving water quality.

Maintains Ecological Balance. A sustainable food system encourages diverse and seasonal eating which maintains ecological balance within a region.

Decreases Dependence on Nonrenewable Energy. Locally-produced and consumed products travel shorter distances. If communities grew and transported more produce intended for local consumption, there would be an annual savings of 280,000 to 346,000 gallons of fuel and an annual reduction of 6.7 million to 7.9 million pounds of CO2 emissions (58).

Builds the Foundation of a Vibrant Community. The US food system is a reflection of the ecological, social, economic and public health stability and integrity of the country. These elements are essential for sustainability, not just for the food system, but also for the whole of society and the future of humanity (59).

Healthy individuals, healthy families, healthy farms, healthy communities and healthy ecosystems are a result of vibrant, resilient and sustainable food systems.

**Tools for
Public
Health
Practitioners**

American Public Health Association Policy Statement on Sustainable Food Systems

In a policy statement titled *Toward a Healthy, Sustainable Food System*, the APHA reviewed the evidence that links the current industrial food system to diet-related chronic disease and poor health. The statement identifies key policies and opportunities for public health practitioners to support sustainable food systems (www.apha.org/advocacy).

Community Food Security: Promoting Food Security and Building Healthy Communities

This report describes community food security, highlights best practices and outlines opportunities for strengthening food security at the community level (www.foodsecurity.org/pubs.html).

Counties and Local Food Systems-Ensuring Healthy Foods, Nurturing Healthy Children

Published by the National Association of Counties, Center for Sustainable Communities, this resource outlines how county governments can support local food systems (www.naco.org).

Cultivating Common Ground - Linking Health and Sustainable Agriculture

This report by the Prevention Institute engages health professionals as advocates for sustainable agriculture (www.preventioninstitute.org).

Designed for Disease – The Link Between Local Food Environments and Obesity and Diabetes

This report by the Center for Public Health Advocacy, Policy Link, and the UCLA Center for Health Policy Research describes the role of food environments in public health and outlines policy recommendations to make healthy foods more available (www.policylink.org).

Food Without Thought - How US Farm Policy Contributes to Obesity

Published by the Institute for Agriculture and Trade Policy, this report identifies the connection between agriculture policy and obesity and how food and farm policies can garner public health rewards while benefiting farmers and rural communities (www.iatp.org).

Healthy Land, Healthy People: Building a Better Understanding of Sustainable Food Systems for Food and Nutrition Professionals

Developed by the American Dietetic Association, this primer provides tools for dietitians to incorporate sustainable food systems strategies into all areas of dietetic practice. For a copy, contact Angie Tagtow (angie.tagtow@mac.com).

Health Care without Harm

Health Care without Harm provides tools for institutions to procure healthy food that is ecologically sound, economically viable and socially responsible (www.noharm.org/us/food/issue).

Journal of Hunger & Environmental Nutrition

A special double issue titled *Sustainable Food Systems: Perspectives from the United States, Canada and the European Union* showcases food systems experts who provide their analyses of the global food system and offer alternatives for creating a sustainable food system (<http://JHEN.HaworthPress.com>).

Policy Guide on Community and Regional Food Planning

Developed by American Planning Association to support the incorporation of comprehensive food planning policies into community planning activities (www.planning.org/policyguides).

The “Good Food” Checklist for Public Health Practitioners

Public health practitioners can be a guiding force in the establishment of a healthy, green, fair, affordable and accessible food system. Using this checklist, pick five “Good Food” strategies you will accomplish in the next few months as either a public health practitioner, within your organization, or as an individual, and build from there. You may find you are doing some already!

As a public health practitioner, I will...

- Become a member of the APHA Food and Nutrition/Environmental Health Work Group
- Include sustainable food system tips in public health and nutrition education materials
- Educate public health students about:
 - The link between sustainable food systems and population health
 - The interconnectedness of food and agricultural policy with the availability of healthy food
 - Strategies to incorporate sustainable food systems into public health practice
- Work with food banks and pantries to regularly provide local, seasonal and sustainably-raised food
- Incorporate local, seasonal and sustainably-raised food into disaster and emergency preparedness plans
- Refer clients to the WIC or Senior Farmers’ Market Nutrition Programs
- Provide support and encouragement to mothers who are breastfeeding
- Encourage point-of-sale identification of local, seasonal and sustainably-raised food in markets
- Include the public health benefits of sustainable food systems on the health department’s website
- Write articles or blogs about the health benefits of sustainable food systems
- Add food systems concepts into presentations or media interviews
- Complete a community food profile as part of the next community health needs assessment and health improvement plan
- Develop sustainable food system strategies that support public health performance measures

As a public health organization, we will...

- Implement a reduce, reuse, recycle program in the workplace
- Use recycled disposables versus styrofoam or plastic products and select packaging options that are recyclable and environmentally friendly
- Promote local, seasonal and sustainably-raised food to individuals, families, institutions and communities

- Serve local, seasonal and sustainably-raised food at meetings and conferences
- Work with food banks and pantries to regularly provide local, seasonal and sustainably-raised food
- Provide support for breastfeeding promotion initiatives
- Support schools, hospitals and long-term care facilities who choose to purchase directly from local farms and local distributors
- Promote retail innovations, including smaller-scale markets selling healthy foods
- Review food safety issues related to local foods, regional distribution and transportation systems
- Host a farmers market at the health department

In the community, we will...

- Support and promote community gardens and greenhouses
- Implement a reduce, reuse, recycle program in the community
- Promote agritourism and ecotourism in the community
- Promote *Buy Fresh Buy Local* marketing initiatives
- Establish a food policy council in the community
- Monitor federal legislation related to the Farm Bill, Child Nutrition & WIC Reauthorization, Transportation, etc.
- Work with city councils, boards of health, boards of supervisors, state and federal policy makers on establishing vibrant, resilient and sustainable food systems by:
 - Reducing barriers to obtaining healthy, green, fair, affordable and accessible foods
 - Increasing incentives for farmers to grow fruits and vegetables
 - Incorporating sustainable agriculture and other public health goals in the Farm Bill and Child Nutrition & WIC Reauthorization
 - Supporting federal food and nutrition programs (i.e., WIC, Food Stamps, WIC Farmers Market Nutrition Program, School Breakfast and Lunch Programs, Fruit and Vegetable Snack Program) that connect participants with fresh, locally-grown food
 - Supporting food production practices that reduce the use of synthetic chemicals and non-therapeutic antibiotics, conserve resources, and decrease work-related injuries
 - Increasing research funding for reviewing the health impacts of current agriculture policy and how sustainable food systems can improve public health

The “Good Food” Checklist for Public Health Practitioners (continued)

- Aligning Dietary Guidelines for Americans with foods that are healthy, green, fair, affordable and accessible
- Establishing financial supports for retail grocery stores in low-income communities, and for new and transitioning small and mid-sized farms
- Implementing and enforcing Country of Origin Labeling
- Urging greater environmental standards and enforcement on industrial animal production and waste
- Prohibiting outdoor production of genetically engineered crops to produce pharmaceuticals, industrial compounds and non-food ingredients
- Expanding environmental health and public health tracking of food systems concerns
- Support local food processors such as meat lockers and canning facilities
- Start a gardening program at a school, daycare, church, hospital, long-term care facility, or community center
- Purchase fair-trade, organic coffee, tea and chocolate
- Compost fruit and vegetable scraps
- Implement a reduce, reuse, recycle program at home
- Use recycled disposables versus styrofoam or plastic products and select packaging options that are recyclable and environmentally friendly
- Complete a Master Gardener course
- Buy food from a community supported agriculture (CSA) farm or a farmers market
- Become an organic farmer
- Glean food from local farmers for food banks and pantries

At a personal level, I will...

- Learn more about the public health benefits of sustainable, community-based food systems
- Educate others about the health, social and environmental benefits of eating local, seasonal and sustainably-raised food
- Choose a diet rich in locally-grown and seasonal foods
- Maintain a container or a backyard garden
- Shop at the local farmers’ market, food co-op or buy directly from local farms and road stands
- Advocate for local, seasonal and sustainably-raised food at restaurants
- Support businesses and restaurants that use local, seasonal and sustainably-raised food
- Request food stores to buy from local farmers and processors
- Submit a letter to the editor or an op-ed about the benefits of “Good Food” - food that is healthy, green, fair, affordable, and accessible

“Shades of Green” - Examining the Food System with a Critical Eye

Interest in environmentally-friendly food products and food production practices is growing. The food and beverage industry has responded to this interest and has created environmentally-friendly marketing schemes. However, as companies “green” their products or extol sustainable business practices, consumers need to be equipped with the tools to decipher the new marketing trends.

Use the following checklist to determine the “shade of green” of a food or beverage product. The more ✓s, the greater contribution the food product makes to a sustainable food system.

- The producer or farmer who grew the food is known.
- The location of where the food originated is known.
- The food traveled the least distance possible.
- The food is fresh, whole, seasonal and grown without harming soil, water or air quality.
- The food was raised humanely without synthetic hormones or antibiotics.
- The process to produce the food conserves genetic biodiversity and ecological integrity.
- The food company has made a commitment to sustainability, social responsibility and environmental best practices.
- The farm workers, processors or food service workers earned a fair wage, worked in safe conditions and were not exploited in the making of this food.
- The nutritional value of the food is maintained and it is free of artificial ingredients.
- There were no or low environmental impacts as a result of processing and transporting the food.
- The food packaging is minimal, made from renewable resources and is recyclable.
- The label on the food product directs you to find more information. Product labeling is transparent.
- The name and any claims of the food product are specific, meaningful and logical.
- The food product has a legitimate and reputable third-party seal or certification.
- The local, national and global implications of this food product are known.

References

1. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948.
2. Berry W. *What Are People For?* New York, NY:North Point Press;1990.
3. W. K. Kellogg Foundation. *Good Food Audit: Distribution*. April 2007.
4. Heller M. *Food Connections-Capital Area Food Connections*. East Lansing, MI:CS Mott Group for Sustainable Food Systems, Michigan State University. Available at <http://www.mottgroup.msu.edu/ProgramsActivities/CommunityFoodProfiles/tabid/888/Default.aspx>.
5. Bucchini L, Goldman L. Starlink corn: a risk analysis. *Environ Health Perspect*. 2002;110(1):5-13.
6. Brasher P. *Unapproved Biotech Corn in Iowa*. Des Moines Register, February 22, 2008. Available at <http://www.desmoinesregister.com/apps/pbcs.dll/article?AID=/20080222/BUSINESS/80222036/1001/>.
7. Buzby J, Farah Wells H, Vocke G. Possible Implications for U.S. Agriculture from Adoption of Select Dietary Guidelines. USDA, Economic Research Service, November 2006.
8. Huang S, Huang K. Increased U.S. Imports of Fresh Fruits and Vegetables. USDA, Economic Research Service, Report #FTS-328-01, September 2007. Available at <http://www.ers.usda.gov/Publications/fts/2007/08Aug/fts32801/fts32801.pdf>.
9. Eyzaguirre P, Padulosi S, Hodgkin T. IPGRI's strategy for neglected and underutilized species and the human dimension of agrobiodiversity. In S. Padulosi, ed. *Priority-setting for Underutilized and Neglected Plant Species of the Mediterranean Region*. Rome, Italy:International Plant Genetic Resources Institute (IPGRI);1999.
10. Johns T, Eyzaguirre P. Linking biodiversity, diet and health in policy and practice. *Proceedings of the Nutrition Society*. 2006;65:182-189.
11. Davis D, Epp M, Riordan H. Changes in USDA food composition data for 43 garden crops, 1950 to 1999. *J Am Coll Nutr*. 2004;23:669-682.
12. Halweil B. *Still No Free Lunch: Nutrient Levels in the U.S. Food Supply Eroded by Pursuit of High Yields*. The Organic Center; September 2007. Available at www.organic-center.org.
13. *Antibiotics and food. Food and Environment Update*. Cambridge, MA: Union of Concerned Scientists;2006.
14. *Antibiotic Resistance. Federal Agencies Need to Better Focus Efforts to Address Risk to Humans from Antibiotic Use in Animals*. Report to Congressional Requesters. Washington, DC: U.S. General Accounting Office;April 2004.
15. Food and Drug Administration. *Facts About Antibiotic Resistance*. Washington, DC.
16. *The State of World Fisheries and Aquaculture 2006*. Rome, Italy: Food and Agriculture Organization of the United Nations; 2007. Available at: www.fao.org/docrep/009/A0699e/A0699e00.htm.
17. Worm B, Barbier E, Beaumont N, et al. Impacts of biodiversity loss on ocean ecosystem services. *Science*. 2006;314:787-790.
18. Gianessi L, Reigner N. *Pesticide use in the U.S. crop production: 2002. Fungicides, herbicides, insecticides and other pesticides*. Washington, DC: CropLife Foundation; February 2006.
19. Horrigan L, Lawrence R, Walker P. How sustainable agriculture can address the environmental and human health harms of industrial agriculture. *Env Health Persp*. 2002;101(5):445-456.
20. Duffy M, Tegtmeier E. External costs of agricultural production in the United States. *Intnl J of Agric Sustainability*. 2004;2(1):1-20.
21. Krouse L, Galluzzo T. *Iowa's Local Food Systems: A Place to Grow*. The Iowa Policy Project. February 2007. Available at www.iowapolicyproject.org.
22. Iowa Daily Erosion Project. Average Soil Loss 2008-01-01 to 2008-08-20. Accessed on August 20. Available at <http://wepp.mesonet.agron.iastate.edu/index.phtml>.
23. Howard A. *The Soil and Health. A Study of Organic Agriculture*. 2006. Lexington, KY:The University of Kentucky Press.
24. Burkholder J, Libra B, Weyer P, et al. Impacts of waste from concentrated animal feeding operations on water quality. *Environ Health Perspect*. 2007;115:308-312.
25. Institute of Medicine. *Dioxins and Dioxin-Like Compounds in the Food Supply: Strategies to Decrease Exposure*. Washington, DC: National Academies Press; 2003.
26. Steinfeld H, Gerber P, Wassenaar T, Castel V, Rosales M, de Haan C. *Livestock's Long Shadow*. Rome, Italy: Food and Agriculture Organization of the United Nations. 2006. Available at: www.virtualcentre.org/en/library/key_pub/longshad/A0701E00.htm.
27. Pimentel D, Pimentel M. Sustainability of meat-based and plant-based diets and the environment. *Am J Clin Nutr*. 2003;78(suppl):660S-663S
28. Hendrickson M, Heffernan W. *Concentration of Agricultural Markets*. Columbia, MO: University of Missouri; April 2007. Available at <http://www.foodcircles.missouri.edu/consol.htm>.
29. Gallagher M. *Examining the Impacts of Food Desserts on Public Health in Chicago*. Chicago, IL:Mari Gallagher Research & Consulting Group; 2006. Available at <http://www.lasallebank.com/about/stranded.html>.
30. Eshel G, Martin P. Diet, energy and global warming. *Earth Interactions*. 2006;10(9):1-17.
31. Hoffman I. Ecological impact of a high-meat, low-meat and ovo-lacto vegetarian diet. Presentation at the Fourth International Congress on Vegetarian Nutrition. Lima Linda, CA:April 2002.
32. Carlsson-Kanyama A, Ekstrom M, Shanahan H. Food and life cycle energy inputs: Consequences of diet and ways in increase efficiency. *Ecological Economics*. 2003;1-15.
33. Clauson A. Food CPI, Prices and Expenditures: Food Expenditures by Families and Individuals as a Share of Disposable Personal Income. USDA Economic Research Service. July 2007. Available at <http://www.ers.usda.gov/briefing/CPIFoodAndExpenditures/Data/table7.htm>.
34. Miller C, Coble K. Cheap food policy: Fact or rhetoric. *Food Policy*. 2007;32:98-111.
35. Martinez S. The US Food Marketing System: Recent Developments. 1997-2006. ERR-42. USDA, Economic Research Service. May 2007. Available at www.ers.usda.gov/briefing/foodmarketingsystems/.
36. Roberts S, Feld E. *Hunger in Iowa*. Agricultural Law Center, Drake University. April 2007.
37. Wright Morton L, Blanchard T. Starved for Access: Life in Rural America's Food Deserts. *Rural Realities*. Rural Sociological Society. 2007; 1(4):1-10.

References (continued)

38. Farah H, Buzby J. US Food Consumption Up 16 Percent Since 1970. Amber Waves. Washington, DC: USDA Economic Research Service; November 2005.
39. Bray G, Joy-Nielsen S, Popkin B. Consumption of high-fructose corn syrup in beverages may play a role in the epidemic of obesity. *Am J Clin Nutr.* 2004;79(4):537-543.
40. Drewnowski A. Obesity and the food environment: Dietary energy and diet costs. *Am J Prev Med.* 2004;27(3):154-162.
41. Dimitri C, Greene C. Recent Growth Patterns in the U.S. Organic Foods Market. USDA Economic Research Service Agriculture Information Bulletin AIB777. Washington, DC: USDA ERS; 2002. Available at: www.ers.usda.gov/publications/aib777/.
42. Nord M. Household Food Security in the United States, 2006, ERR-49. USDA Economic Research Service, November 2007.
43. Brown L, Shepherd D, Martin T, Orwat J. *The Economic Cost of Domestic Hunger: Estimated Burden to the U.S.* The Sodexo Foundation. 2007.
44. Designed for Disease: The Link Between Local Food Environments and Obesity and Diabetes. California Center for Public Health Advocacy, Policy Link, and the UCLA Center for Health Policy Research. April 2008
45. Finkelstein E, Fiebelkorn I, Wang G. National medical spending attributable to overweight and obesity: How much and who's paying? *Health Affairs.* 2003;W3:219-226.
46. Centers for Disease Control and Prevention. National diabetes fact sheet: general information and national estimates on diabetes in the United States, 2007. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2008.
47. Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of overweight and obesity in the United States, 1999–2004. *JAMA.* 2006;295:1549–1555.
48. 2007 Pediatric Nutrition Surveillance System. Summary of Trends in Growth Indicators by Age. Centers for Disease Control & Prevention; 2007. Available at http://www.cdc.gov/pednss/pednss_tables/tables_health_indicators.htm#1.
49. Olshansky S, et al. A potential decline in life expectancy in the United States in the 21st Century. *NEJM.* 2005;352:1138-1145.
50. Pirog R, Larson A. Consumer Perceptions of the Safety, Health, and Environmental Impact of Various Scales and Geographic Origin of Food Supply Chains. 2007. Ames, IA: Leopold Center for Sustainable Agriculture.
51. World Cancer Research Fund, American Institute for Cancer Research. Food, Nutrition and the Prevention of Cancer: A Global Perspective. Washington, DC: American Institute for Cancer Research; 1997.
52. Clancy K. Greener Pastures. How Grass-fed Beef and Milk Contribute to Healthy Eating. Union of Concerned Scientists. 2006. Available at: www.ucsusa.org/food_and_environment/sustainable_food/greener-pastures.html.
53. Johns T, Maundu P. Forest biodiversity, nutrition and population health in market-oriented food systems. *Unasylva.* 2006;224(57):34-40.
54. 1998 Survey of Buying Power. Sales and Marketing Management. 1998.
55. Tagtow A, Harmon A. Healthy Land, Healthy Food & Healthy Eaters. Sustainable Food Systems: Opportunities for Dietitians. Prepared for the 2008 Food and Nutrition Conference & Exhibition, Chicago, IL.
56. Swenson D. The Economic Impacts of Increased Fruit and Vegetable Production and Consumption in Iowa: Phase II. Ames, IA: Leopold Center for Sustainable Agriculture; May 2006.
57. Pirog R. Ecolabel Value Assessment Phase II: Consumer Perceptions of Local Foods. Ames, Iowa: Leopold Center for Sustainable Agriculture; May 2004.
58. Pirog R, Van Pelt T, Enshayan K, Cook E. Food, Fuel and Freeways: An Iowa Perspective on How Far Food Travels, Fuel Usage and Greenhouse Gas Emissions. Ames, IA: Leopold Center for Sustainable Agriculture; June 2001.
59. Ikerd J. My Top Ten Reasons for Eating Local. Available at <http://web.missouri.edu/~ikerdj/papers/SFT-TopTenLocal.htm>.

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