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### Toward a Healthy, Sustainable Food System

**Policy Date:** 11/6/2007

**Policy Number:** 200712

#### PURPOSE

In the United States, obesity and diet-related chronic disease rates are escalating, while the public's health is further threatened by rising antibiotic resistance; chemicals and pathogens contaminating our food, air, soil and water; depletion of natural resources; and climate change. These threats have enormous human, social, and economic costs that are growing, cumulative, and unequally distributed. These issues are all related to food—what we eat and how it is produced. The US industrial food system provides plentiful, relatively inexpensive food, but much of it is unhealthy, and the system is not sustainable. Although most US food consumption occurs within this industrial system, healthier and more sustainable alternatives are increasingly available.

The American Public Health Association (APHA) has long been active on food system issues, as is shown by the large body of relevant policy. Moving toward a healthier and more sustainable food system will involve tackling longstanding challenges and addressing new and evolving demands. This position paper reviews the scientific basis for understanding the US food system and sustainability, identifies specific issues of concern, discusses key related policies and action opportunities, and outlines APHA goals. By uniting multiple food system themes in a single statement, it aims to provide clarity, new emphases, and solid direction, encouraging the APHA to increase its activities and leadership to promote a more sustainable, healthier, and more equitable food system.

#### BACKGROUND

##### Overview of the US Food System

A systems approach<sup>1</sup> to food enables consideration of the many intricately related factors involved in getting food from farm to consumer, as well as their implications for health. Food systems include inputs, mechanisms, and structures for food production, processing, distribution, acquisition, preparation, consumption, and metabolism.<sup>2</sup> Also included in a food system approach are the participants in that system, including farmers, fishers, industries, workers, governments, institutional purchasers, communities, and consumers. Food systems are deeply entwined with many social issues. Overlapping food systems serve local, regional, national, and global levels; herein, the term refers to the national level, unless noted.

APHA defines a sustainable food system as one that provides healthy food to meet current food needs while maintaining healthy ecosystems that can also provide food for generations to come with minimal negative impact to the environment. A sustainable food system also encourages local production and distribution infrastructures and makes nutritious food available, accessible, and affordable to all. Further, it is humane and just, protecting farmers and other workers, consumers, and communities.

##### The Human Right to Food

The right to food is a fundamental human right.<sup>3,4</sup> In 2004, the United States signed on to United Nations Voluntary Guidelines that build on the Rome Declaration on World Food Security, Plan of Action statement: "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. The four pillars of food security are availability, stability of supply, access and utilization."<sup>5(1)</sup> A broad range of issues are involved in ensuring this right, including protecting nutritional quality, ensuring food safety and freedom from adverse substances, providing adequate livelihood to enable purchasing food, and avoiding abrogating the rights of others including farmers and other workers.<sup>6</sup> The right to food is to be fulfilled progressively through ongoing efforts of the signatory nations, including the United States.<sup>5,6</sup> Having advocated that the standards be only voluntary, the United States must demonstrate that this option can be meaningful.

The United States has eroded the pillars of food security. APHA can provide an important stimulus to help restore the pillars and ensure that our food system is sustainable.

##### Food System Economics

The food system represents a significant portion of the US economy, accounting for at least \$1 trillion in annual sales, 13% of the gross national product, and 17% of the workforce.<sup>7</sup> In Fiscal Year 2006, the United States also exported more than \$68.7 billion in

agricultural products and imported more than \$64 billion worth of agricultural products.<sup>8</sup> For seafood, the picture is much different. The US currently imports more than 80% of its seafood,<sup>9</sup> and in 2005 our “seafood deficit” for edible fishery products was \$8 billion.<sup>10</sup> In the current industrial food system, there is significant market concentration, giving larger agricultural, processing, and retailing companies advantages in dictating prices; influencing public policy; controlling information; and determining the choices and risks available to consumers, food producers, and other workers.<sup>7,11–13</sup> Food system impacts are unequally distributed, with the greatest costs (health effects and health-related costs, low wages, stressful conditions) borne by food producers and other workers, rural communities, and low-income consumers. Taxpayers also support this system through health care, social services, infrastructure, and subsidies and other benefits that accrue disproportionately to the largest agri/food businesses.<sup>14,15</sup>

#### HUMAN HEALTH IMPACTS

This position paper describes key environmental health and public health nutrition issues and discusses key affected populations. Several recent APHA policies have extensively addressed obesity and diet-related disease issues.<sup>16–22</sup> This position paper strongly reaffirms APHA commitment to those policies, while avoiding repeating their content.

##### Environmental Public Health Impacts

###### Pesticides and Fertilizers

In industrial agriculture, high yields are achieved through intensive methods that require large quantities of nonrenewable fossil fuel-based “inputs,” such as fertilizers and pesticides. Fertilizers and pesticides contaminate soils, groundwater, and streams. The US Geological Survey found 70% of domestic and public drinking water well samples to be contaminated with at least 1 volatile organic compound, pesticide, or nitrate from human sources; 12% of wells exceeded environmental or human health criteria for at least 1 sample.<sup>23</sup> Fertilizer-derived nutrients from agricultural runoff contaminate streams and rivers and cause “dead zones” downstream, endangering fisheries, ecosystems, and economies. For instance, runoff into the Mississippi River has led to a Gulf of Mexico dead zone that in some recent years has been as large as the state of New Jersey.<sup>24</sup> Two studies calculated US public health costs of pesticide use at about \$1.1 billion per year based only on acute poisonings plus associated illnesses (in one) and cancer (in the other).<sup>25,26</sup> Further human and social costs come from pesticide effects on the neurologic, respiratory, and reproductive systems.<sup>26</sup>

###### Intensive Food Animal Production

Industrial food animal production facilities (also known as “factory farms”) concentrate and confine up to thousands or even millions of animals in small areas. Today, 40% of all US animals are raised on the largest 2% of livestock facilities.<sup>27</sup> US industrial food animal producers generate in excess of 335 million pounds of dry manure waste each year.<sup>27</sup> Disposal of this waste by applying it to land often exceeds the ability of adjacent land to absorb nitrogen and phosphorous, thus leading to soil saturation, with the excess running off into streams and shallow aquifers. Contamination with animal waste produced within the industrial system is a concern for human and ecosystem health because the waste often contains pathogens, including antibiotic-resistant bacteria, dust, arsenic, dioxin and other persistent organic pollutants, antibiotics, and complex mixtures of hundreds of volatile organic compounds.<sup>28,29</sup>

Industrial food animal production has significant effects on air quality, emitting ammonia, hydrogen sulfide, carbon dioxide, particles contaminated with many different microorganisms, organic dusts, and bacterial endotoxins.<sup>30</sup> Multiple studies have shown substantially elevated rates of respiratory conditions among workers and community members living near such facilities, including elevations in childhood asthma.<sup>31,32</sup>

Since APHA’s 2003 endorsement of a precautionary moratorium on all new concentrated animal feeding operations (CAFO’s, the largest industrial food animal production sites),<sup>33</sup> additional evidence has emerged on their environmental and public health harms,<sup>28,30,31,34–37</sup> including avian flu.<sup>35,36</sup>

###### Antibiotic Overuse and Other Feed Additives

Antibiotics and heavy metals are routinely used to promote growth in food animals. More than 70% of all US antibiotics are estimated to be fed to hogs, poultry, and beef cattle for such nontherapeutic reasons.<sup>38</sup> Although evidence suggests no financial benefit,<sup>39</sup> this practice may compensate for heightened disease risks and other problems from concentrating animals under confinement and for feeding them grains rather than on pasture or grass.<sup>40</sup> As discussed in several APHA policies, these uses may contribute to the epidemic of antimicrobial-resistant infections afflicting humans.<sup>36,40–44</sup> The European Union recently phased out all routine use of antibiotics as animal feed additives.<sup>45</sup> Feed additives can pass through animals into manure that is land applied, therefore contaminating soil and potentially air and groundwater as well.<sup>40</sup>

###### Climate Change

Worldwide agriculture and land-use change are estimated to cause about one third of global warming due to greenhouse gas emissions,<sup>46</sup> whereas in the United States, agriculture contributes an estimated 8% of greenhouse gas emissions.<sup>46</sup> Agriculture’s effect on climate change is caused both by emissions (such as burning fossil fuels) and reduced storage of gases in soils and other media. Meat production is a particularly powerful contributor; the Food and Agriculture Organization of the United Nations (UN FAO) estimates that approximately 18% of all greenhouse gas emissions worldwide come from livestock production.<sup>47</sup> One study compared greenhouse gases from the average American diet and a same-calorie vegetarian diet and found that the difference, summed across the population, would account for 6% of all US greenhouse gas emissions.<sup>48</sup> Despite this impact on climate change risk, the contributions of the food system and meat consumption are generally left out of the discussion on global climate change.

###### Energy Use

Industrialized agriculture methods are fossil fuel intensive; the US food system accounts for an estimated 10.5% of the nation's energy use and 19% of its fossil fuel consumption.<sup>48,49</sup> Much of the food system's fossil fuel energy goes into manufacturing fertilizers and pesticides.<sup>50</sup> Transportation is a further user, with studies estimating that the average vegetable travels approximately 1500 miles from farm to supermarket.<sup>51</sup> Industrial animal production consumes especially large amounts of energy, requiring 35 calories of fossil fuel to produce 1 calorie of food energy—not counting the energy required for processing, packaging, cold storage, and transportation of meat.<sup>49</sup>

#### Water Use

Industrial agriculture requires extensive irrigation. Corn and soy are particularly heavy users among plants. Industrial meat production, especially beef, requires the most water—much of it to irrigate feed crops. For example, by one estimate it takes more than 100 000 L of water to produce grain and hay for each kilogram of industrially produced beef.<sup>52</sup> There are substantial government subsidies for water in arid areas, encouraging inefficiency and greater water use than aquifers can sustain and, in some cases, depleting glacial aquifers that cannot be replenished.<sup>53</sup>

#### Pharmaceutical and Industrial Crops

Drug and biotechnology companies use genetically engineered plants (in which genes foreign to the plants are inserted to produce desired qualities) to produce drugs, hormones, vaccines, and industrial chemicals. The health and ecosystem threats are magnified when the modified genes in plant species are also used for food such as corn, rice, and soybeans and when these altered crops are grown outdoors.<sup>54</sup> In 2007, the US Department of Agriculture approved open-air commercial production of rice containing human-derived genes to produce pharmaceutical proteins.<sup>55</sup> Genetically engineered crops unapproved for food use, including pharmaceutical crops, have contaminated crops destined for the food supply repeatedly in the recent past.<sup>56–58</sup> Given that industrial food processing involves combining large masses of food, the impact of small instances of cross-pollination or seed mixing can be magnified throughout the food system.

#### Biodiversity

US biodiversity (variety of life forms) is challenged by purposeful industrial decisions and unintended consequences of agricultural and industrial society. Loss of biodiversity can affect ecosystem productivity and stability in many ways, including reducing future breeders' options in selecting for traits based on the needs of their time, as well as future opportunities for using genetic material in pharmaceutical development. In 2006, the Food and Agriculture Organization of the United Nations reported that 1 in 5 farm animal breeds was on the verge of extinction.<sup>59</sup> Crop biodiversity is also reduced by farm policy incentives for producing specific crops and limiting production to certain high-yield plants. One in 4 acres of US cropland has been used for growing corn alone, and this practice is projected to increase in response to growing demand for corn ethanol.<sup>60</sup>

#### Fisheries and Aquaculture Impacts

Industrial technologies, subsidies, and poor fisheries management over the past 50 years have led to severely diminished fish stocks globally.<sup>61</sup> Seventy-five percent of the world's fish stocks are fully exploited, overexploited, or depleted,<sup>62</sup> and a recent study projects 90% depletion of all fisheries by midcentury should current fishing practices continue unchecked.<sup>63</sup> Domestic fisheries are facing similar declines—one third are either overfished or experiencing overfishing.<sup>64</sup> As fisheries become depleted, and thus commercially unviable, consumption patterns shift to less-exploited stocks; should this negative-feedback cycle continue, the few stocks remaining are also likely to crash as they become more aggressively fished.

Worldwide declines in wild fish stocks have helped catalyze the expansion of the aquaculture industry (farm-raised fish), which now produces 43% of the world's edible fish.<sup>62</sup> Aquaculture presents an opportunity to supplement wild fisheries, but some types of aquaculture can have serious ecological impacts. Many aquaculture operations pose issues similar to industrial meat production facilities, including high stocking densities, use of antibiotics and parasiticides, and waste discharge into the surrounding environment. In addition, feed for predatory fish such as salmon uses large amounts of fishmeal and oil, made from wild caught fish. Approximately 2 to 5 pounds of wild fish are needed to produce 1 pound of predatory farmed fish, leading to a net loss of protein from the ocean.<sup>65</sup> Despite these documented impacts, the National Oceanic Atmospheric Administration plans to expand the domestic aquaculture industry from approximately \$1 billion to \$5 billion per year over the next 2 decades,<sup>66</sup> without adequate environmental safeguards.

### NUTRITIONAL PUBLIC HEALTH IMPACTS

#### Predominant Food Products

US farm policy provides few incentives promoting production of fruits and vegetables, but it provides strong incentives that contribute to excess production and consumption of sweets, fats, and meat.<sup>67</sup> This is in sharp contrast to the US Department of Agriculture's own 2005 Dietary Guidelines for Americans.<sup>68–71</sup> A shift to recommended consumption levels would require substantial changes in agricultural production.<sup>71</sup> Current production decisions result in food processors' using artificially cheap high fructose corn syrup and hydrogenated soy oil in most processed foods, helping to make sweets and fats convenient and inexpensive for consumers.<sup>67,72,73</sup> In addition, 60% of the US corn crop and 47% of the soy crop are used to produce grain feed for livestock,<sup>74</sup> not counting what is needed to feed poultry and fish. That figure also does not include the substantial amount of domestically produced corn and soybeans exported for use as animal feed overseas. Artificially low grain prices represent a sizeable benefit to the industrial meat industry; one study estimated the 1997–2005 savings at \$11.25 billion for the broiler chicken industry and \$8.5 billion for industrial hog production, with a large portion of the totals going to only 1 chicken and 1 pork producer.<sup>75</sup>

#### Nutritional Quality Agricultural Products

Methods used to increase crop yield (including planting crops closely, soil tilling, and planting the same crop year after year in the same field) can deplete the soil nutrients available for uptake and therefore lower crop nutritional quality. In addition, farmers typically use seeds bred for high yield, pest resistance, and other qualities rather than for nutritional value. One study found declines in key nutrients in many foods between 1950 and 1999 and attributed them to the choices of crop varieties planted.<sup>76</sup>

Lower-nutrient-containing crops enter the human food supply both through direct consumption and through animal product consumption. Meat from corn- and soy-fed animals is high in omega-6 fatty acids, whereas grass-fed animals are higher in omega-3 fatty acids. Studies show that industrial Western diets may provide more than 15 times the optimal omega-6:omega-3 ratio and that high ratios may be associated with adverse health outcomes, including cardiovascular disease, cancer, osteoporosis, and inflammatory and autoimmune diseases.<sup>77</sup> Meat from grass-fed cattle is generally leaner and contains higher levels of conjugated linoleic acid than feed-lot cattle. Animal studies suggest that linoleic acid has beneficial effects on heart disease, cancer, and the immune system.<sup>78</sup>

#### Seafood Products

Both the 2005 Dietary Guidelines Advisory Committee Report<sup>79</sup> and the American Heart Association<sup>80</sup> have recommended that individuals eat 2 servings of fish per week as a good source of lean protein and as the only significant source of preformed long-chain polyunsaturated omega-3 fatty acids [namely docosahexaenoic acid (DHA) and eicosapentaenoic acid]. However, American seafood consumption falls far short of these recommendations, averaging only 5 oz of fish per week.<sup>81</sup> Increased consumption of low-contaminant seafood has been associated with a reduced risk of cardiovascular events and cardiovascular mortality in the general population and with an increased gestation period in pregnant mothers. DHA supplementation has also been associated with increased visual acuity and cognitive function in infants and children.<sup>82</sup> That said, seafood with high levels of environmental contaminants such as methylmercury, is associated with adverse health effects, as outlined in APHA Policy Statement 99-10, Preventing Human Methylmercury Exposure to Protect Public Health. Seafood products are also important dietary sources of other toxic chemicals of concern, including polychlorinated biphenyls and dioxins.<sup>83</sup>

#### Food Labeling

Accurate food labeling helps ensure consumers' right to know about issues that may affect them and promotes informed decisionmaking in food purchasing. Food labels can let consumers know where their food comes from, support thinking about the distances food travels and related transportation energy use, inform about methods of production, increase traceability for food safety investigations, and raise consumer trust in labels as guides to informed food purchasing. Labeling can also serve to reflect consumer demand back through the food chain, potentially contributing to growth of more sustainable farm production. The 2002 Farm Bill required labels indicating countries of origin for some meats, fruit, fish, and shellfish, but implementation for meat and fruit was delayed because of opposition from the food-processing industry and large corporate retailers.<sup>84</sup> There is also great consumer support for labeling genetically modified and cloned foods.<sup>85</sup>

#### Food-Borne Hazards

There are numerous food-borne hazards of concern, and many APHA policies have addressed these hazards.<sup>86–98</sup> Here we add perspectives on 3 issues:

**Infectious agents.** Infectious food-borne illnesses exert an enormous human and economic toll in the United States.<sup>99–101</sup> Industrial food animal production is a major source of pathogens affecting food-borne illness.<sup>36,52</sup> The routine use of antibiotic feed additives in industrial animal agriculture can also lead to a greater prevalence of antibiotic-resistant pathogens on meat. Industrial food animal production is often omitted from news media and other accounts of food safety hazards and, as such, may receive less attention in intervention strategy development.<sup>99</sup> There is need for improved understanding of how best to reduce the risks from animal production.

**Pesticides.** In 2005, the US Department of Agriculture reported finding detectable pesticide residues in 73% of fresh fruit and vegetable samples and 61% of processed fruit and vegetable samples.<sup>102</sup> Organically produced foods have fewer pesticide residues. One 2006 study found that when children switched to organic diets, their urine pesticide levels dropped immediately and precipitously.<sup>103</sup> Exposures are also especially high for workers and those living near farms.<sup>104,105</sup> Long-term pesticide health effects include some cancers and problems in the reproductive, immune, endocrine, and nervous systems.<sup>106</sup> Unfortunately, it can be difficult to obtain and to afford foods produced with no or few pesticides, particularly in low-income communities.<sup>107</sup>

**Animal feed ingredients.** In industrialized production of poultry and livestock, there is a need for much-expanded scrutiny of feed ingredients and their potential to affect human health. For example, organic arsenical compounds are added to feed for 70% or more of the 8.6 billion broiler chickens raised in the United States annually, according to an Environmental Protection Agency estimate.<sup>108</sup> Arsenicals are Food and Drug Administration–approved for pigmenting chicken meat in addition to promoting growth and feed efficiency.<sup>45</sup> Organic arsenic is converted into more harmful inorganic arsenic in the human body and can be converted in soil in as little as 10 days.<sup>109</sup> Inorganic arsenic is a known human carcinogen, and low-level exposures have been associated in other contexts with cardiovascular effects, skin conditions, and intellectual function deficits. The European Union has never approved arsenicals in animal feed.<sup>45</sup>

#### AFFECTED POPULATIONS

The food system affects everyone. Some groups, however, carry more of the burden.

#### Low-Income Food Consumers

Access to varied, healthy, and affordable foods is important to the public's health. Low-income food consumers are particularly affected by obesity and diet-related disease, as discussed in other APHA policy statements. Many low-income and minority communities experience physical and economic barriers to accessing varied, healthy, and affordable food. These barriers are determined in part by limited mobility (e.g., public transportation options, car ownership) and absence of supermarkets or fresh food options (e.g., farmer's markets, community and backyard gardens).<sup>110</sup> Such access restrictions complicate already existing socioeconomic inequities and consequent health disparities among affected populations. Efforts are needed to understand other mechanisms that lead to an unhealthy diet, including gaps in environmental and policy supports to enable more locally based food distribution.<sup>111</sup>

#### Rural Communities and US Farmers

Rural communities have suffered important social, economic, and human capital losses from industrial agriculture. US policies that favor deregulation and promote unsustainable overproduction of grains such as corn and soy have favored global food companies,<sup>112</sup> as have large-scale animal agriculture operations that use artificially inexpensive grains for feed, further concentrating their market power. Meanwhile, smaller and midsized farm owners have been less and less able to compete effectively in the market. Agricultural consolidation is associated with money moving out of rural communities.<sup>36</sup>

Rural communities often have little say when industrial food production facilities want to move in. Large agribusiness lobbies have systematically introduced and passed state laws stripping local governments of their right to pass local ordinances designed to regulate large-scale animal factories and mitigate their public health and environmental impacts.<sup>31,113</sup> Effects of industrial food production on communities include water contamination, odors, respiratory conditions, reduced property values, and stress and mental health effects.<sup>31</sup> Several studies have shown that swine CAFO's are disproportionately situated in low-income communities and communities of color.<sup>32,114,115</sup>

#### Food System Workers

In 1900, 39% of the workforce was employed on farms<sup>116</sup>; today only 0.3% of the workforce is in farming, fishing and forestry.<sup>117</sup> Adding in food processing, preparation and serving brings the food system partial total to 9.1% of the workforce.<sup>117</sup>

Throughout the food system, reported occupational injury, illness, and fatality rates are high,<sup>31,118</sup> despite the barriers to workers reporting these events, such as immigration concerns and precarious financial status.<sup>119,120</sup> In 2002, meat processing had the highest reported rate of occupational injuries and illnesses of any industry in the country. In 2005, agriculture, forestry, fishing, and hunting had the highest rate of occupational fatalities among major industry sectors.<sup>121,122</sup> In the United States and internationally, suicide is a significant cause of farmer death and is potentially associated with social conditions affecting farms and chemical exposures.<sup>123</sup> Although most occupational illnesses cannot be tracked well through national databases, there is evidence that they add significantly to the burden of disease in agricultural production.<sup>31</sup>

Human Rights Watch stated that there are "systematic human rights violations embedded in meat and poultry [processing] employment."<sup>124</sup> (p1) These violations include a failure to use known injury and illness prevention methods, denial of workers' compensation claims, interference with unionizing, and mistreatment of immigrants.<sup>124</sup> Currently the US food system relies heavily on immigrant workers, even as it undercuts the ability of some of those workers to earn fair wages through farming in their own countries. In addition to impacts on individuals and communities, immigration policy can have significant impacts on food system stability. Much food consumed in the United States is also grown or processed overseas, including by child laborers.<sup>125</sup> Although trade agreements may incorporate labor protections, enforcement can be weak.<sup>125,126</sup> Worldwide, the Food and Agriculture Organization of the United Nations estimated that 70% of child labor is performed in agriculture.<sup>127</sup>

#### LOW-INCOME COUNTRIES—FARMERS, FOOD CONSUMERS

Since the 1970s, US agricultural policy has focused on producing large quantities of key grains domestically, with the expectation of exporting the surplus. Grains are either donated as international food aid or sold abroad at prices below the actual cost of local production—an illegal practice known as "dumping" in trade terminology. Although such contributions can help feed the hungry in the short term, they also can devastate the livelihoods of local farmers and, eventually, local economies.<sup>128</sup> Food aid fosters long-term dependence in receiving countries and harms self-sufficiency by reducing the capacity of local agriculture systems to produce food. Brazil successfully challenged the legality of US cotton subsidies under World Trade Organization agreements, and Canada, the European Union, Australia, Argentina, and Brazil are challenging US corn subsidies based on the argument that such subsidies contribute to illegal dumping.<sup>129</sup> Although subsidies are 1 factor that contributes to dumping, studies have demonstrated that the deregulation of agricultural markets and the resulting overproduction are more important causes and that simply eliminating subsidies will not solve the problem.<sup>130</sup>

#### FEDERAL AND STATE FOOD POLICIES, REGULATIONS, AND PROVISIONS

##### Farm and Food Policy

Historically, a key farm support mechanism in US agricultural policy was a set of provisions to stabilize crop prices at levels to ensure fair compensation for farmers. This was considered necessary given an inherent tendency in crop agriculture to overproduce. More recent farm policy has abandoned the goal of fair, stable prices. Instead, since the 1970s US farm policy has promoted the high production of selected crops, particularly corn and soybeans, in ways that have tended to drive market prices below the cost of production. Direct payments to farmers have provided short-term, though unsustainable, means for keeping farmers on the farm.

Although US commodity subsidies have nearly tripled since the passage of the 1996 Farm Bill, net farm income has declined 16.5%.<sup>130</sup> Some of the specific negative effects of this farm policy include the following:

1. Oversupply, which further depresses prices.
2. Lower prices for high fructose corn syrup and hydrogenated soy oil, leading to their ubiquitous use in processed foods.
3. Low-priced corn and soy animal feed that unfairly benefits environmentally damaging industrial animal production over more sustainable methods.
4. US dumping of certain crops at below the cost of production onto world markets, forcing farmers in developing countries like Mexico off their land and leaving them no alternative but to migrate to urban areas or north to the United States to find new employment.
5. Overuse of chemicals and natural resources as farmers try to increase yields to make up for low farm prices.
6. Increased disparities as large businesses receive disproportionate direct and indirect subsidies.
7. Almost all subsidy payments are simple “pass throughs” going immediately from the farmer to fertilizer, seed, and equipment producers.

#### Farm and Food Bill

The US Farm Bill could potentially address many of the issues included in this position paper. This omnibus bill, due for renewal every 5 to 6 years, is a major piece of US legislation that helps shape what foods are grown or produced and what foods are available in the US marketplace. With many powerful interests attempting to influence the farm bill and great potential public health impact, it is important for the public health community to weigh in. The largest component of the Farm Bill is the Food Stamp Program, and APHA Policy Statement 2006-18, Reducing Nutrition-Related Disparities in America through Food Stamp Nutrition Education and the Reauthorization of the Farm Bill, outlines changes needed in the Food Stamp program and some related nutrition issues. Additional priority areas of public health concern<sup>131–133</sup> include provisions to—

1. Shift US investments toward promoting healthy, local, sustainably produced foods and seeking to align food prices with national nutritional priorities to create a fair playing field for healthy food.
2. Expand the infrastructure for providing locally grown food.
3. Improve the access of low-income Americans to healthy and local food.
4. Advance food sovereignty that asserts that all countries have the right to determine their own food and farm policies as long as they do no harm to other countries and disallows crop dumping overseas.
5. Inform consumers about food origins and other information about how food is produced.
6. Strengthen the livelihoods of small farmers and rural communities.
7. Fund research, technical aid, and marketing assistance for sustainable food production.
8. Support adoption and continuation of more sustainable farming methods and discouraging intensive, industrial food production.
9. Enforce antitrust laws in agriculture.

#### Environmental Regulations

Other policies relevant to mitigating the environmental impacts of the food system are those related to regulatory compliance for CAFOs. Enforcement has been weak, including regulations under the Clean Air Act, Clean Water Act, Comprehensive Environmental Response, Compensation, and Liability Act (Superfund), and Emergency Planning and Community Right to Know Act.<sup>113,134,135</sup> There have been many attempts to exempt CAFOs altogether from laws.<sup>113</sup> In 2003, the US Government Accountability Office estimated that only 40% of CAFOs had Clean Water Act permits.<sup>134</sup> In general, state variation in implementation of these policies<sup>134</sup> promotes a race to the bottom as facilities migrate to places with laxer enforcement.<sup>113</sup> Many localities have had their ability to address CAFO concerns through local policy removed.<sup>113</sup> There is a need for stronger and well-implemented regulation.

#### Infrastructure to Support Healthy, Sustainable, Just Agriculture

Demand for local, sustainable, and fair trade food production has recently increased. This is seen in the growth of organic food industry at a rate of about 20% per year.<sup>136</sup> These important trends could expand even faster with additional support for food processing, distribution, and marketing infrastructure (including portable food processing facilities), coverage through government food programs, and institutional procurement—to both expand access and contribute to reducing price. Further, much of today’s organic food is produced by large, geographically distant firms that may or may not treat workers exceptionally well. Consumers seeking to make ethical food choices are thus required to choose between their values; improved infrastructure could improve consumer options for obtaining food that is healthy, sustainable, and just.

#### FISHERIES MANAGEMENT

The nation’s primary federal fisheries law—the Magnuson-Stevens Fishery Conservation and Management Act of 1976—established 8 regional councils to manage fisheries in the US Exclusive Economic Zone (3–200 miles from shore). However, most of the fisheries managed under this system lack the necessary information for thorough assessments, and approximately one third of those with sufficient data are classified by the National Oceanic and Atmospheric Administration as “overfished” or “experiencing overfishing.”<sup>137</sup> The 2006 Magnuson Stevens Reauthorization Act takes a large step forward for fish conservation by incorporating several key provisions that will lead to more sustainable fisheries, including—

1. Scientifically based caps on fishing catches
2. A commitment to ending overfishing for all federally managed species

3. Instructions on the establishment of incentive-based fisheries management mechanisms
4. Rules for marine protected areas that are closed to all fishing

#### PUBLIC HEALTH ACTIVITIES AND RESEARCH

Funds for federal, state and local public health departments are needed to protect the public's health from food system-related harms. Specific areas needing funding include public health tracking, research, education, inspections, and other interventions. Much research is needed to better understand the health effects of food system exposures and to develop optimal prevention methods. Research is also needed on policy, social, and behavioral tools for increasing access to and consumption of sustainably produced foods.

#### FOOD POLICY COUNCILS

There has been a growing movement of state and local food policy councils, often created through legislation, that convene key stakeholders to evaluate their areas' food systems and make recommendations.<sup>127</sup>

#### RECOMMENDATIONS FOR A HEALTHY, SUSTAINABLE FOOD SYSTEM

APHA recognizes the urgency of transforming our food system to promote environmental sustainability, improve nutritional health, and ensure social justice, and therefore—

1. Urges the public health community to increase its engagement in food system issues and to educate policymakers; media; food industry; and public health, nutrition, and environmental professionals about public health issues and solutions associated with the food system, including issues related to sustainability, nutrition, and justice.
2. Urges Congress to include sustainable agriculture and other public health goals in the Farm Bill, Magnuson Stevens, Child Nutrition Act, and other relevant legislation to—
  - a. Support environmentally sound agricultural practices to reduce contamination, resource use, climate change, and work-related injury/illness
  - b. Promote sustainability goals through policy tools, including “green subsidies,” support of research, marketing, technical assistance and education, demonstration, farm transition support, and microcredit/low-interest loans and the farm bill Conservation title
  - c. Better align US investment emphasis with the Dietary Guidelines for Americans and seek to make healthy, sustainably produced foods the affordable, convenient choices
  - d. Encourage the ability of small-scale farmers in low- and middle-income countries to produce greater portions of their countries' own food supply
  - e. Improve food labeling for country-of-origin and genetic modification
  - f. Ban nontherapeutic antimicrobial use and arsenic use and increase funding for surveillance and research on antimicrobial resistance in healthy animals and ensure public health oversight of animal feed ingredients
  - g. Promote comprehensive food safety policies, including addressing root causes of food contamination, particularly from industrial animal production
  - h. Promote equity, justice, and appropriate competition in the food and agriculture industries and challenge abuses of power
  - i. Increase research funding on the health effects of food system exposures and how to prevent them and on all aspects of sustainable food production, both from technical and social science/policy perspectives
  - j. Encourage US aquaculture development only if initiatives include strong environmental protections, particularly for wild fisheries
3. Urges the Environmental Protection Agency to—
  - a. Develop minimum environmental standards for agricultural facilities to receive government support (including subsidies and procurement contracts)
  - b. Refuse to exempt industrial agricultural sites from regulations or enforcement
  - c. Improve data collection on food animal production emissions and waste and require monitoring and pollution control technology
4. Urges the US Department of Agriculture to prohibit the outdoor production of food and feed crops genetically engineered to produce pharmaceuticals, industrial compounds, and specialty foods not intended for consumption by the general population and to strengthen regulation and oversight of outdoor production of non-food and feed crops genetically engineered for these purposes
5. Urges CDC, state and local health departments, and others to—
  - a. Expand environmental public health tracking relevant to food system concerns
  - b. Increase activities to monitor, evaluate, and respond to hazards, exposures, and health outcomes of communities, farmers, and other workers
  - c. Increase education about the system's contribution to greenhouse gases and the benefits of eating more locally produced food and reducing industrial meat consumption
  - d. Increase education about choosing environmentally preferable and healthful types of seafood, using tools such as seafood wallet cards
6. Urges the Occupational Safety and Health Administration (OSHA) to—
  - a. Expand coverage of agricultural and small workplaces under OSHA regulations
  - b. Improve enforcement and strengthen penalties for workplace safety and underreporting violations
  - c. Require employers to report occupational injuries/illnesses of their contract and temporary workers
7. Encourages governmental food procurement programs (including school breakfast, lunch, and snack programs and the Special Supplemental Nutrition Program for Women, Infants and Children) and institutional food providers to consider the benefits of locally and sustainably produced, healthy and fair trade foods and to take steps to incorporate these into their programs.
8. Encourages the National Oceanic Atmospheric Administration to ensure that the new provisions of the Magnuson Stevens Reauthorization Act concerning fisheries conservation are implemented in a timely manner

9. Encourages cooperative efforts in local food systems, with governmental support, to—
  - a. Improve local food marketing, distribution, and processing capacity and infrastructure
  - b. Establish and promote food policy councils to enable evaluating food systems and recommend changes
  - c. Reduce barriers to obtaining sustainable, locally produced, fair trade and healthy foods
  - d. Increase state and local cooperative extension program activities targeted to small farms and those producing fruits and vegetables
10. Urges involvement of an independent body such as the Institute of Medicine or US Government Accountability Office to conduct a broad review of the public health impacts of US agricultural policy and engage in ongoing monitoring to assure that public health concerns are better heard in decisionmaking about agricultural policy.

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