Re-submitted June 18, 2007.

Toward a healthy, sustainable food system

I. 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 U.S. industrial food system provides plentiful, relatively inexpensive food, but much of it is unhealthy and the system is not sustainable. While most U.S. 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 (Appendix 1). 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 U.S. 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.

II. BACKGROUND

A. Overview of the U.S. Food System: A systems approach[1] 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.[2] Also included in a food system approach are the participants in that system, including farmers, fishers, industry, 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.

B. The Human Right to Food: The right to food is a fundamental human right.[3,4] In 2004, the U.S. signed onto United Nations Voluntary Guidelines that state, "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."[5] A broad range of issues are involved in assuring the right, including nutritional quality, food safety/freedom from adverse substances, adequate livelihood to enable purchasing food, and avoiding abrogating the rights of others including farmers and other workers.[5] The right to food is to be fulfilled progressively through ongoing efforts of the signatory nations, including the U.S. [4,5] Having advocated that the standards be only voluntary, the U.S. must demonstrate

that this option can be meaningful.

We have eroded the pillars of food security. APHA can provide an important stimulus to help restore them and assure that our food system is sustainable.

C. Food System Economics: The food system represents a significant portion of the U.S. economy, accounting for at least $1 trillion in annual sales, 13 percent of the gross national product, and 17 percent of the workforce.[6] In Fiscal Year 2006 the U.S. also exported over $68.7 billion in agricultural products and imported over $64 billion worth.[7] For seafood, the picture is much different. The U.S. currently imports over 80% of its seafood[8], and in 2005 our 'seafood deficit' for edible fishery products was $8 billion.[9] 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.[6,10,11,12] 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.[13,14]

III. 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.[15] This position paper strongly reaffirms APHA commitment to those policies, while avoiding repeating their content.

A. ENVIRONMENTAL PUBLIC HEALTH IMPACTS

1. Pesticides and Fertilizers: In industrial agriculture, high yields are achieved through intensive methods that require large quantities of non-renewable fossil-fuel based "inputs" such as fertilizers and pesticides. Fertilizers and pesticides contaminate soils, groundwater and streams. The U.S. Geologic Service found 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; 12 percent of wells exceeded environmental or human health criteria for at least one sample.[16] 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.[17] Two studies calculated U.S. 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).[18,19] Further human and social costs come from pesticide effects on the neurological, respiratory, and reproductive systems.[19]

2. Intensive Food Animal Production: Industrial food animal production facilities (aka "factory farms") concentrate and confine up to thousands or even millions of animals in small areas. Today, 40 percent of all U.S. animals are raised on the largest two percent of livestock facilities.[20] U.S. industrial food animal producers generate in excess of 335 million pounds of dry manure waste each year.[20] 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.[21,22]

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.[23] Multiple studies have shown substantially elevated rates of respiratory conditions among workers and community members living near such facilities, including elevations in childhood asthma. [24,25]

Since APHA's 2003 endorsement of a precautionary moratorium on all new concentrated animal feeding operations (CAFOs, the largest industrial food animal production sites),[26] additional evidence has emerged on their environmental and public health harms,[21,23,24,27,28,29] including avian flu.[28,29]

3. Antibiotic Overuse and other Feed Additives: Antibiotics and heavy metals are routinely used to promote growth in food animals. Over 70 percent of all U.S. antibiotics are estimated to be fed to hogs, poultry and beef cattle for such non-therapeutic reasons. [31] While evidence suggests no financial benefit,[32] 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.[33] As discussed in several APHA policies, these uses may contribute to the epidemic of antimicrobial-resistant infections afflicting humans.[29,33,34,35]

The European Union recently phased out all routine use of antibiotics as animal feed additives.[36]

Feed additives can pass through animals into manure that is land applied, therefore contaminating soil and potentially air and groundwater as well.[33]

4. Climate Change: Worldwide agriculture and land use change are estimated to cause about 1/3 of global warming due to greenhouse gas emissions,[37] while in the United States, agriculture contributes an estimated 8 percent of greenhouse gas emissions.[37] Agriculture's effect on climate change is due both to emissions (such as burning fossil fuels) and reduced storage of gases in soils and other media. Meat production is a particularly powerful contributor; the United Nations Food and Agriculture Organization (UN FAO) estimates that about 18 percent of all greenhouse gas emissions worldwide come from livestock production.[38] 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 percent of all U.S. greenhouse gas emissions.[39] 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. *[See also: proposed resolution, Addressing the Urgent Threat of Global Climate Change to Public Health and the Environment.]*

5. Energy Use: Industrialized agriculture methods are fossil-fuel intensive; the U.S. food system accounts for an estimated 10.5 percent of the nation's energy use and 19 percent of its fossil fuel consumption.[39,40] Much of the food system's fossil fuel energy goes into manufacturing fertilizers and pesticides;[41] Transportation is a further user, with studies estimating that the average vegetable travels about 1,500 miles from farm to supermarket.[42] Industrial animal production consumes especially large amounts of energy, requiring 35 calories of fossil fuel to produce one calorie of food energy – not counting the energy required for processing, packaging, cold storage, and transporting meat.[40]

6. 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 over 100,000 liters of water to produce grain and hay per kg of industrially produced beef.[43] 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.[44]

7. 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 are in plant species also used for food, such as corn, rice, and soybeans, and when these altered crops are grown outdoors.[45] In 2007, the USDA approved open-air commercial production of rice containing human-derived genes to produce pharmaceutical proteins.[46] Genetically engineered crops unapproved for food use, including pharmaceutical crops, have contaminated crops destined for the food supply repeatedly in the recent past.[47,48,49] 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.

8. Biodiversity: U.S. biodiversity (variety of life forms) is challenged by purposeful industrial decisions and unintended consequences of agricultural/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 needs of their time, as well as future opportunities for using genetic material in pharmaceutical development. In 2006, the UN Food and Agriculture Organization reported that one in five farm animal breeds was on the

verge of extinction.[50] Crop biodiversity is also reduced by farm policy incentives for producing specific crops and limiting production to certain high yield plants. One in four acres of U.S. cropland has been used for growing corn alone, and this is projected to increase in response to growing demand for corn ethanol.[51]

9. Fisheries and Aquaculture Impacts: Industrial technologies, subsidies, and poor fisheries management over the past 50 years have led to severely diminished fish stocks globally.[52] Seventy-five percent of the world's fish stocks are fully exploited, overexploited, or depleted,[53] and a recent study projects 90% depletion of all fisheries by mid-century should current fishing practices continue unchecked.[54] Domestic fisheries are facing similar declines – one-third are either overfished or experiencing overfishing.[55] 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 percent of the world's edible fish. [53] 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. Additionally, feed for predatory fish such as salmon uses large amounts of fish meal and oil, made from wild caught fish. Approximately two to five pounds of wild fish are needed to produce one pound of predatory farmed fish, leading to a net *loss* of protein from the ocean.[56] Despite these documented impacts, the National Oceanic Atmospheric Administration

(NOAA) plans to expand the domestic aquaculture industry from approximately $1 billion to $5 billion per year over the next two decades,[57] without adequate environmental safeguards.

B. NUTRITIONAL PUBLIC HEALTH IMPACTS

1. Predominant Food Products: U.S. farm policy provides few incentives promoting production of fruits and vegetables, but provides strong incentives that contribute to excess production and consumption of sweets, fats and meat.[58] This is in sharp contrast to the USDA's own *2005 Dietary Guidelines for Americans*[59,60,61,62,63,64] A shift to recommended consumption levels would require substantial changes in agricultural production.[64] 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.[58,65,66] In addition, 60 percent of the U.S. corn crop and 47 percent of the soy crop are used to produce grain feed for livestock,[67] 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[68] 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 one chicken and one pork producer.[69] (Corn use in ethanol has reduced this benefit in 2007.)

2. Nutritional Quality:

a. 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.[70]

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, while grass-fed animals are higher in omega-3 fatty acids. Studies show that industrial Western diets may provide over 15 times the optimal omega-6:omega-3 ratio and that high ratios may be associated with health outcomes including cardiovascular disease, cancer, osteoporosis, and inflammatory and autoimmune diseases. [71] 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.[72]

b. Seafood Products: Both the *2005 Dietary Guidelines Advisory Committee Report*[73] and the American Heart Association[74] recommend that individuals eat two 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 [EPA]). However, American seafood consumption falls far short of these recommendations, averaging only five ounces of fish per week.[75] 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.[76]

That said, seafood with high levels of environmental contaminants such as methylmercury,

is associated with adverse health effects, as outlined in APHA Policy Number 9910 "Preventing Human Methylmercury Exposure to Protect Public Health." Seafood products are also important dietary sources of other toxic chemicals of concern, including polychlorinated biphenyls (PCBs) and dioxins.[77]

3. Food Labeling: Accurate food labeling helps assure consumers' right to know about issues that may affect them, and promotes informed decision-making 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 due to opposition from the food processing industry and large corporate retailers.[78] There is also great consumer support for labeling genetically modified and cloned foods.[79]

4. Food-Borne Hazards: There are numerous food-borne hazards of concern, and many APHA policies have addressed these hazards. [80] Below we add perspectives on three issues:

***a. Infectious Agents*:** Infectious food-borne illnesses exert an enormous human and economic toll in the United States.[81,82,83] Industrial food animal production is a major source of pathogens affecting food-borne illness.[29,43] 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.[84] There is need for improved understanding of how best to reduce the risks from animal production.

b. Pesticides: In 2005, the USDA reported finding detectable pesticide residues in 73 percent of fresh fruit and vegetable samples and 61 percent of processed fruit and vegetable samples.[85] 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.[86] Exposures are also especially high for workers and those living near farms.[87,88] Long-term pesticide health effects include some cancers and problems in the reproductive, immune, endocrine, and nervous systems.[89] Unfortunately, it can be difficult to obtain and to afford foods produced with no or few pesticides, particularly in low income communities.[90]

c. Animal Feed Ingredients: In industrialized production of poultry and livestock, there is 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 percent or more of the 8.6 billion broiler chickens raised in the U.S. annually, according to an EPA estimate.[91] Arsenicals are FDA-approved for pigmenting chicken meat in addition to growth promotion and feed efficiency. [36] 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.[92] 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.[36]

C. AFFECTED POPULATIONS

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

1. 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 (public transportation options, car ownership) and absence of supermarkets or fresh food options (farmer's markets, community and backyard gardens).[93] Such access restriction complicates already existing socioeconomic inequities and consequent health disparities among affected populations. Efforts are needed to understand other mechanisms leading to an unhealthy diet including gaps in environmental and policy supports to enable more locally based food distribution.[94]

2. Rural Communities and U.S. Farmers: Rural communities have suffered important social, economic and human capital losses from industrial agriculture. U.S. policies that favor deregulation and promote unsustainable overproduction of grains like corn and soy have favored global food companies,[95] as well as 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.[29]

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.[24,96] Effects

of industrial food production on communities include water contamination, odors, respiratory conditions, reduced property values, and stress and mental health effects.[24] Several studies have shown that swine CAFOs are disproportionately situated in low income communities and communities of color.[25,97,98]

3. Food System Workers: In 1900, 39 percent of the workforce was employed on farms,[99] while today only 0.3 percent of the workforce is in Farming, Fishing and Forestry.[100] Adding in food processing, preparation and serving brings the food system partial total to 9.1 percent of the workforce.[100]

Throughout the food system, reported occupational injury, illness and fatality rates are high,[24,101] despite the barriers to workers reporting these events, such as immigration concerns and precarious financial status.[102,103] 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.[104,105] In the U.S. and internationally, suicide is a significant cause of farmer death, and is potentially associated with social conditions affecting farms and/or chemical exposures.[106] While most occupational illnesses cannot be well-tracked through national databases, there is evidence that they add significantly to the burden of disease in agricultural production.[24]

Human Rights Watch stated that there are "systematic human rights violations embedded in meat and poultry [processing] employment." These violations include a failure to use known injury/illness prevention methods, denial of workers' compensation, interference with unionizing, and mistreatment of immigrants.[107] Currently the U.S. 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 U.S. is also grown and/or processed overseas, including by child laborers.[108] While trade agreements may incorporate labor protections, enforcement can be weak. [108,109] Worldwide, the UN FAO estimates that 70 percent of child labor is performed in agriculture.[110]

4. Low Income Countries – Farmers, Food Consumers: Since the 1970's, U.S. 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. While such contributions can help feed the hungry in the short term, they also can devastate the livelihoods of local farmers and, eventually, local economies.[111] 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 U.S. cotton subsidies under World Trade Organization agreements, and Canada, the European Union, Australia, Argentina and Brazil are challenging U.S. corn subsidies based on the argument that such subsidies contribute to illegal dumping.[112] While subsidies are one 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.[113]

IV. FEDERAL AND STATE FOOD POLICIES, REGULATIONS AND PROVISIONS

A. Farm and Food Policy: Historically, a key farm support mechanism in U.S. 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 U.S. 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 U.S. commodity subsidies have nearly tripled since the passage of the 1996 Farm Bill, net farm income has declined 16.5 percent.[113] Some of the specific negative effects of this farm policy include:

- Oversupply, which further depresses prices;
- Lower prices for high fructose corn syrup and hydrogenated soy oil, leading to their ubiquitous use in processed foods;
- Low-priced corn and soy animal feed that unfairly benefits environmentally damaging industrial animal production over more sustainable methods;
- U.S. 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;
- Overuse of chemicals and natural resources, as farmers try to increase yields to make up for low farm prices;
- Increased disparities as large businesses receive disproportionate direct and indirect subsidies;
- Almost all subsidy payments are simple “pass-throughs” going immediately from the farmer to fertilizer, seed and equipment producers.

Re-submitted June 18, 2007.

B. Farm and Food Bill: The U.S. Farm Bill could potentially address many of the issues included in this position paper. This omnibus bill, due for renewal every 5-6 years, is a major piece of U.S. legislation that helps shape what food is grown or produced and what foods are available in the U.S. 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 200618, "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[114,115] include provisions to:

- 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;
- Expand infrastructure for providing locally grown food
- Improve the access of low income Americans to healthy and local food;
- 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 disallowing crop dumping overseas;
- Inform consumers about food origins and other information about how food is produced;
- Strengthen the livelihoods of small farmers and rural communities;
- Fund research, technical aid, and marketing assistance for sustainable food production;
- Support adoption and continuation of more sustainable farming methods and discouraging intensive, industrial food production;

- Enforce anti-trust laws in agriculture.

C. Environmental Regulations: Other policies relevant to mitigating the environmental impacts of the food system are those related to regulatory compliance for confined animal feeding operations (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. [96,116,117] There have been many attempts to exempt CAFOs altogether from laws.[96] In 2003 the US Government Accountability Office estimated that only 40 percent of CAFOs had Clean Water Act permits.[116] In general, state variation in implementation of these policies[116] promotes a race to the bottom as facilities migrate to places with laxer enforcement.[96] Many localities have had their ability to address CAFO concerns through local policy removed.[96] There is a need for stronger and well-implemented regulation.

D. 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 percent per year.[118] 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.

E. Fisheries Management: The nation's primary federal fisheries law – the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1976 – established eight regional councils to manage fisheries in the United States' 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'.[119] The 2006 Magnuson Stevens Reauthorization Act (MSRA) takes a large step forward for fish conservation by incorporating several key provisions that will lead to more sustainable fisheries, including:

- Scientifically-based caps on fishing catches;
- A commitment to ending overfishing for all federally managed species;
- Instructions on the establishment of incentive-based fisheries management mechanisms;
- Rules for Marine Protected Areas (MPAs) that are closed to all fishing.

F. 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.

G. Food Policy Councils: There has been a growing movement of state and local Food Policy Councils, often created through legislation, which convene key stakeholders to evaluate their areas' food systems and make recommendations. [110]

Re-submitted June 18, 2007.

See Appendix 1 for a listing of past APHA policies relevant to the food system, and recommendations for archiving, updating and replacing.

IV. RECOMMENDATIONS FOR A HEALTHY, SUSTAINABLE FOOD SYSTEM

The American Public Health Association recognizes the urgency of transforming our food system to promote environmental sustainability, improve nutritional health and assure social justice, and therefore:

1. Urges the public health community to increase its engagement in food system issues, and educate policymakers, media, food industry, and public health, nutrition, and environment 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 in order 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/education, demonstration, farm transition support and microcredit/low interest loans; and the farm bill Conservation title;
   c. Better align U.S. 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 non-therapeutic antimicrobial use and arsenic use and increase funding for surveillance and research on antimicrobial resistance in healthy animals, and also assure 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; and

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. Only encourage US aquaculture development if initiatives include strong environmental protections, particularly for wild fisheries.

3. Urges the U.S. 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 USDA 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 strengthen regulation and oversight of outdoor production of non-food and feed crops genetically engineered for these purposes.

5. Urges the Centers for Disease Control and Prevention, 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 to:

a. Expand coverage of agricultural and small workplaces under OSHA regulations;
b. Improve enforcement and strengthen penalties for workplace safety and underreporting violations; and
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 take steps to incorporate these into their programs.

8. Encourages NOAA 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; and

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 Government Accountability Office to conduct a broad review of the public health impacts of U.S. agricultural policy; and engage in ongoing monitoring to assure that public health

concerns are better heard in decision-making about agricultural policy.

Re-submitted June 18, 2007.

REFERENCES

1. Leischow SJ, Milstein B. Systems Thinking and Modeling for Public Health Practice. Am J. Pub Health. 2006 Mar; 96(3): 403-405.

2. Sobal J, Khan LK, Bisogni C. A conceptual model of the food and nutrition system. Soc. Sci. Med. 1998;47(7):853-863.

3. United Nations (UN), Universal Declaration of Human Rights. Article 25. At: http://www.un.org/Overview/rights.html. Accessed: February 26, 2007.

4. United Nations. Substantive Issues Arising in the Implementation of the International Covenant on Economic, Social and Cultural Rights: General Comment 12. The right to adequate food. At: http://www.unhchr.ch/tbs/doc.nsf/(Symbol)/3d02758c707031d58025677f003b73b9?Opendocument. Accessed: March 6, 2007.

5. Food and Agriculture Organization (FAO), UN. Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security. November 2004. At: http://www.fao.org/docrep/meeting/009/y9825e/y9825e00.htm. Accessed February 23, 2007.

6. Nestle M. Food Politics. Berkeley: University of California Press, 2002.

7. USDA. Latest U.S. Agricultural Trade Data. Updated March 9, 2007. At: http://www.ers.usda.gov/Data/FATUS/monthlysummary.htm. Accessed March 14, 2007.

8. National Oceanic Atmospheric Administration. 2007 National Offshore Aquaculture Act. At: http://www.nmfs.noaa.gov/mediacenter/aquaculture/offshore.htm. Accessed May 14, 2007.

9. National Marine Fisheries Service. Fisheries of the United States, 2005. At:

http://www.st.nmfs.gov/st1/fus/fus05/fus_2005.pdf. Accessed May 14, 2007.

10. Heykoop J. Merger and antitrust issues in agriculture: Statutes and agencies. Congressional Research Service. Updated January 29, 2003. At: http://www.nationalaglawcenter.org/assets/crs/RS20562.pdf. Accessed: February 28, 2007.

11. Hendrickson M, Heffernan WD, Howard PH, Heffernan JB. Consolidation in food retailing and dairy. British Food Journal. 2001; 103: 715-728.

12. USDA. Briefing room -- Food market structures: Food retailing. Updated: January 30, 2007. At: http://www.ers.usda.gov/briefing/foodmarketstructures/foodretailing.htm. Accessed: March 12, 2007.

13. Institute for Agriculture and Trade Policy. A Fair Farm Bill for America. 2007. At: http://www.agobservatory.org/library.cfm?refid=97623. Accessed: March 14, 2007.

14. Government Accounting Office. Community Development: Changes in Nebraska's and Iowa's Counties with Large Meatpacking Plant Workforces, GAO/RCED-98-62. Washington, D.C.: Feb. 27, 1998.

15. APHA Policy Number 200619. Urgent Call for a Nationwide Public Health Infrastructure and Action to Reverse the Obesity Epidemic. 2006. APHA Policy Number LB-06-03. Restricting Trans Fat in the Food Supply. 2006. APHA Policy Number 2005-8. Supporting the WHO Global Strategy on Diet, Physical Activity and Health. 2005. APHA Policy Number 2004-14. Support for Nutrition Labeling in Fast-Food and Other Chain Restaurants. 2004. APHA Policy Number 200317. Food Marketing and Advertising Directed at Children and Adolescents: Implications for Overweight. 2003. APHA Policy Number 2002-4. Reducing Sodium Content in the American Diet. 2002. APHA Policy Number 200013. APHA Resolution on Overweight in Childhood

Re-submitted June 18, 2007.

16. Squillace PJ, Scot JC, Moran MJ, Nolan BT, Kolpin DW. VOCs, pesticides, nitrate, and their mixtures in groundwater used for drinking water in the United States. Environ. Sci. Technol. 2002; 36:1923-1930.

17. Roach J. Gulf of Mexico "dead zone" is size of New Jersey. National Geographic News. May 25, 2005. At: http://news.nationalgeographic.com/news/2005/05/0525_050525_deadzone.html. Accessed: February 15, 2007.

18. Duffy M, Tegtmeier E. External costs of agricultural production in the United States. International Journal of Agricultural Sustainability. 2004; 2(1):1-20.

19. Pimentel D. Environmental and economic costs of the application of pesticides primarily in the United States. Environment, Development and Sustainability. 2005;7:229–252.

20. USDA. FY-2005 Annual report, manure and byproduct utilization national program 206. At: http://www.ars.usda.gov/research/programs/programs.htm?np_code=206&docid=13337. Accessed: February 16, 2007.

21. Burkholder J, Libra B, Weyer P, Heathcote S, Kolpin D, Thorne PS, Wichman M.Impacts of waste from concentrated animal feeding operations on water quality. Environ Health Perspect. 2007. 115:308–312.

22. Institute of Medicine. Dioxins and Dioxin-like Compounds in the Food Supply: Strategies to Decrease Exposure. 2003. Washington DC: National Academies Press.

23. Heederik D, Sigsgaard T, Thorne PS, Kline JN, Avery R, Bønløkke JH, et al. Health effects of airborne exposures from concentrated animal feeding operations. Environ Health Perspect. 2007;115:298–302.

Re-submitted June 18, 2007.

24. Donham KJ, Wing S, Osterberg D, Flora JL, Hodne C, Thu KM, et al. Community health and socioeconomic issues surrounding concentrated animal feeding operations. Environ Health Perspect. 2007; 115:317–320.

25. Mirabelli MC, Wing S, Marshall SW, Wilcosky TC. Race, poverty, and potential exposure of middle-school students to air emissions from Confined Swine Feeding Operations. Environ Health Perspect. 2007;114 (4): 591–596.

26. APHA policy # 20037, Precautionary moratorium on new concentrated animal feeding operations. 2003.

27. Thorne PS. Environmental health impacts of concentrated animal feeding operations: Anticipating hazards- searching for solutions. Environ Health Perspect. 2007. 115:296–297.

28. Bunton B, O'Shaughnessy P, Fitzsimmons S, Gering J, Hoff S, Lyngbye M, et al. Monitoring and modeling of emissions from concentrated animal feeding operations: overview of methods. Environ Health Perspect. 2007. 115:303–307.

29. Gilchrist MJ, Greko C, Wallinga DB, Beran GW, Riley DG, Thorne PS.The potential role of concentrated animal feeding operations in infectious disease epidemics and antibiotic resistance. Environ Health Perspect. 2007. 115:313–316.

30. Otte J, Pfeiffer D, Tiensin T, Price L, Silbergeld E. Evidence-based policy for controlling HPAI in poultry: Bio-security revisited. UN FAO, Pro-Poor Livestock Policy Initiative. A Living from Livestock. Research Report. At: http://www.fao.org/AG/againfo/projects/en/pplpi/docarc/rep-hpai_biosecurity.pdf. Accessed: February 28, 2007.

31. Mellon M, Benbrook C, Benbrook KL. Hogging It: Estimates of Antimicrobial Abuse in Livestock. Washington DC: Union of Concerned Scientists. 2001.

Re-submitted June 18, 2007.

32. Graham JP, Boland JJ, Silbergeld E. Growth promoting antibiotics in food animal production: An economic analysis. Public Health Rep. 2007 Jan-Feb;122(1):79-87.

33. Sapkota AR, Lefferts LY, McKenzie SM, Walker P. What do we feed to food production animals? A review of animal feed ingredients and their potential impacts on human health. Environ Health Perspect. doi:10.1289/ehp.9760 Online 8 February 2007.

34. APHA Policy Number 2004-13. Helping Preserve Antibiotic Effectiveness by Stimulating Demand for Meats Produced Without Excessive Antibiotics; APHA Policy Number 200112. Discontinuing the Use of Fluoroquinolone Antibiotics in Agriculture; APHA Policy Number 9908. Addressing the Problem of Bacterial Resistance to Antimicrobial Agents and the Need for Surveillance.

35. Chapin A, Rule A, Gibson K, Buckley T, Schwab K. Airborne multidrug-resistant bacteria isolated from a concentrated swine feeding operation. Environ Health Perspect. 2005. Feb;113(2):137-42.

36. Wallinga D. Playing Chicken: Avoiding Arsenic in Your Meat. Institute for Agriculture and Trade Policy. 2006. At: www.iatp.org. Accessed: March 15, 2007.

37. Paustian K, Antle JM, Sheehan J, Paul EA. Agriculture's Role in Greenhouse Gas Mitigation. Philadelphia: Pew Center on Global Climate Change, 2006.

38. Steinfeld H, Gerber P, Wassenaar T, Castel V, Rosales M, de Haan C. Livestock's Long Shadow. UN FAO. 2006. At: http://www.virtualcentre.org/en/library/key_pub/longshad/A0701E00.htm. Accessed: March 13, 2007.

39. Eshel G, Martin P. Diet, energy and global warming. Earth Interactions. 2006; 10(9): 1–17.

Re-submitted June 18, 2007.

40. Pimentel D, Pimentel M, eds. Food, Energy and Society. Niwot, CO: University of Colorado Press, 1996.

41. Pimentel D. Impacts of Organic Farming on the Efficiency of Energy Use in Agriculture: An Organic Center State of Science Review. The Organic Center, 2006.

42. Pirog R, Benjamin A. Checking the food odometer: Comparing food miles for local versus conventional produce sales to Iowa institutions. Leopold Center. At:http://www.leopold.iastate.edu/pubs/staff/files/food_travel072103.pdf. Accessed: February 15, 2007.

43. Pimentel D, Pimentel M. Sustainability of meat-based and plant-based diets and the environment. Am J Clin Nutr 2003;78(suppl):660S–3S.

44. Pimentel D, Houser J, Preiss E, White O, Fang H, Mesnick L, Barsky T, et al. Water resources: Agriculture, the environment, and society. BioScience. 1997; 47(2)97-106.

45. Andow D, Lamkey K, Daniell H, Nafziger E, Gepts P, Strayer D. A Growing Concern: Protecting the Food Supply in an Era of Pharmaceutical and Industrial Crops. Washington DC: Union of Concerned Scientists, 2004.

46. Weiss R. USDA Backs Production of Rice with Human Genes. The Washington Post. March 2, 2007, Page A02.

47. Bucchini L, Goldman L. Starlink corn: A risk analysis. Environ Health Perspect. 2002. 110(1).

48. Gillis J. Soybeans mixed with altered corn. The Washington Post. November 13, 2002.

49. Weiss R. Rice recalled over gene contamination. March 6, 2007, Page A08.

50. UN FAO. Farm Animal Biodiversity. At: http://www.fao.org/ag/magazine/0609sp1.htm. Accessed: March 5, 2007.

51. Christensen LA. 2002. Soil, nutrient and water management systems used in U.S. corn production. Agriculture Information Bulletin No. 774. Washington, DC: USDA Economic Research Service. At: http://www.ers.usda.gov/Publications/aib774. Accessed: February 16, 2007.

52. Myers R, Worm B. Rapid worldwide depletion of predatory fish communities. Nature. 2003;423:280-283.

53. Food and Agriculture Organization. The state of world fisheries and aquaculture 2006. 2007. At: http://www.fao.org/docrep/009/A0699e/A0699e00.htm. Accessed: May 14, 2007.

54. Worm B, Barbier EB, Beaumont N, et al. Impacts of biodiversity loss on ocean ecosystem services. Science. 2006;314:787-790.

55. United States Department of Commerce. National Marine Fisheries Service 2004 Report to Congress: The Status of U.S. Fisheries. 2005. At: http://www.nmfs.noaa.gov/sfa/reports.htm. Accessed: May 14, 2007.

56. Goldburg R, Naylor R. Future seascapes, fishing, and fish farming. Frontiers Ecol Env. 2005;3:21-28.

57. United States Department of Commerce. Aquaculture Policy. 1999. At: http://www.nmfs.noaa.gov/trade/DOCAQpolicy.htm. Accessed May 14, 2007.

58. Schoonover H, Muller M. Food without Thought: How U.S. Farm Policy Contributes to Obesity. Minneapolis: Institute for Agriculture and Trade Policy. March 2006. At: http://www.iatp.org/iatp/publications.cfm?accountID=258&refID=80627. Accessed: February 12, 2007.

59. USDA. Dietary Guidelines for Americans 2005. At: http://health.gov/dietaryguidelines/ Accessed: February 12, 2007.

Re-submitted June 18, 2007.

60. Putnam J, Allshouse J, Kantor LS. U.S. per capita food supply trends: More calories, refined carbohydrates, and fats. USDA Food Review. 25(3). At: http://www.ers.usda.gov/publications/FoodReview/DEC2002/frvol25i3a.pdf Accessed: February 12, 2007.

61. APHA Policy Number 2005-8. Supporting the WHO Global Strategy on Diet, Physical Activity and Health.

62. There is a small Farm Bill program of apple subsidies, and fruit and vegetable production is also supported by non-farm bill subsidies such as for water and public provision of roads and other infrastructure. However, the overall level of support is negligible by comparison.

63. Farm Security and Rural Investment Act of 2002.

64. Buzby J, Farah Wells H, Vocke G. Possible implications for U.S. agriculture from adoption of select dietary guidelines. USDA ERS, November 2006. At: www.ers.usda.gov/publications/err31. Accessed: March 12, 2007.

65. Drewnowski A, Specter SE. Poverty and obesity: the role of energy density and energy costs. American Journal of Clinical Nutrition. 2004; 79(1):6-16.

66. French SA. Pricing effects on food choices. J. Nutr. 2003.133;841S-843S.

67. Institute for Agriculture and Trade Policy. Below-Cost Feed Crops: An Indirect Subsidy for Industrial Animal Factories. June, 2006. At: www.iatp.org. Accessed: February 12, 2007.

68. See “Current Farm Policy”, below, for explanation.

69. Wise TA, Starmer E. Industrial livestock companies’ gains from low feed prices, 1997-2005. 2007. At: http://www.ase.tufts.edu/gdae/Pubs/rp/CompanyFeedSvgsFeb07.pdf. Accessed: March 2, 2007.

70. Davis DR, Epp MD, Riordan HD. Changes in USDA food composition data for 43 garden

crops, 1950 to 1999. J. Am Coll Nutr. 2004;23(6):669-82.

71. Simopoulos AP. Evolutionary aspects of diet, the omega-6/omega-3 ratio and genetic variation: nutritional implications for chronic diseases. Biomed Pharmacother. 2006;60(9):502-7.

72. Clancy K. Greener Pastures: How grass-fed beef and milk contribute to healthy eating. Washington DC:Union of Concerned Scientists. 2006. At: http://www.ucsusa.org/food_and_environment/sustainable_food/greener-pastures.html. Accessed: March 12, 2007.

73. Dietary Guidelines Advisory Committee. 2005 Dietary Guidelines Advisory Committee Report. At: http://www.health.gov/DietaryGuidelines/dga2005/report/default.htm. Accessed: May 14, 2007.

74. AHANC American Heart Association Nutrition Committee. Diet and lifestyle recommendations revision 2006: a scientific statement from the American Heart Association Nutrition Committee. Circulation. 2006;114:82-96.

75. 2006 Annual Report on the United States Seafood Industry. H.M. Johnson & Associates. At: http://www.hmj.com/Economics%20and%20Marketing.pdf. Accessed: May 14, 2007.

76. Institute of Medicine. Seafood choices: balancing benefits and risks. Nesheim MC, Yaktine AL, eds. Washington, DC: The National Academies Press; 2007.

77. United States Environmental Protection Agency, Office of Water Science. Fish Advisories: Chemical-Specific Fact Sheets. At: http://epa.gov/waterscience/fish/chemfacts.html. Accessed: May 14, 2007.

78. USDA. 2002 Farm Bill: Country of Origin labeling. At: http://www.ams.usda.gov/COOL/. Accessed: February 27, 2007.

Re-submitted June 18, 2007.

79. Pew Initiative on Food and Biotechnology. Public sentiments about genetically modified foods 2006 survey. At: http://pewagbiotech.org/research/2006update/9.php. Accessed: February 23, 2007.

80. APHA Policy Number 2002-6. Access to Safe Water, Sanitation, and Hygiene Promotion in Developing Countries. 2002; APHA Policy Number 9907. Ensuring the Safety of the Food Supply in the United States. 1999; APHA Policy Number 9910. Preventing Human Methylmercury Exposure to Protect Public Health. 1999; APHA Policy Number 9303. Evaluating Federal Meat, Poultry, and Seafood Inspection. (Archived). 1993; APHA Policy Number 7926 (PP). Food and Beverage Container Health and Safety. 1979; APHA Policy Number 7925 (PP). Protection of the Public against Foods and Beverages That Are Unfit for Human Consumption. 1979; APHA Policy Number 7741 (PP). Tamper-Proofing Food Containers to Prevent Pre-Purchase Contamination. 1977; APHA Policy Number 7826. Public Health Aspects of Food or Beverage Container Design and Disposal. 1978; APHA Policy Number 7306. Strengthening and Coordinating Milk and Food Sanitation Programs. 1973; APHA Policy Number 7213. A National Food Protection Program (Archived). 1972; APHA Policy Number 6923 (PP). Meat and Poultry Inspection Foreword (Archived). 1969; APHA Policy Number 5711. Federal Legislation on Food Additives (Archived). 1957; APHA Policy Number 4906. Chemical Substances in Foods. 1949.

81. Centers for Disease Control and Prevention (CDC). Foodborne Illness. At: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/foodborneinfections_g.htm. Accessed: February 12, 2007.

82. USDA ERS. Economics of Foodborne Disease: Estimating the Benefits of Reducing Foodborne Disease. At: http://www.ers.usda.gov/briefing/FoodborneDisease/features.htm.

Re-submitted June 18, 2007.

Accessed: February 12, 2007.

83. U.S. Government Accountability Office (U.S. GAO). High Risk Series: An Update. GAO 07-310. Washington, DC: GAO. 2007.

84. Centers for Disease Control and Prevention (CDC). Foodborne Illness. At: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/foodborneinfections_g.htm. Accessed: February 12, 2007.

85. USDA. Pesticide Data Program Annual Summary, Calendar Year 2005. November 2006. At: http://www.ams.usda.gov/science/pdp/Summary2005.pdf. Accessed: March 8, 2007.

86. Lu C, Toepel K, Irish R, Fenske RA, Barr DB, Bravo R. Organic diets significantly lower children's dietary exposure to organophosphorus pesticides. Environ. Health Perspect. 2006; 114(2):260-3.

87. Eskenazi B, Bradman A, Castorina R. Exposures of children to organophosphate pesticides and their potential adverse health effects. Environ Health Perspect. 1999; 107(Suppl 3): 409–419.

88. McCauley LA, Lasarev MR, Higgins G, Rothlein J, Muniz J, Ebbert C, Phillips J. Work characteristics and pesticide exposures among migrant agricultural families: A community-based research approach. Environ Health Perspect. 2001;109(5): 533-538.

89. Blair A. Zahm SH. Agricultural exposures and cancer. Environ Health Perspect. 1995. 103(Suppl 8):205-208.

90. Dimitri C, Oberholtzer L. Organic price premiums remain high. USDA Amber Waves. September 2005. At: http://www.ers.usda.gov/AmberWaves/September05/Findings/OrganicPrice.htm. Accessed: March 6, 2007.

Re-submitted June 18, 2007.

91. Chapman HD, Johnson ZB. Use of antibiotics and roxarsone in broiler chickens in the USA: analysis for the years 1995 to 2000.Poultry Sci. 2002; 81(3):356-364.

92. Stolz JF, Perera E, Kilonzo B, Kail B, Crable B, Fisher E, Ranganathan M, Wormer L, Basu P. Biotransformation of 3-Nitro-4-hydroxybenzene Arsonic Acid (Roxarsone) and Release of Inorganic Arsenic by Clostridium Species. Environ. Sci. & Technol. Published online 1/10/2007.

93. Pearson T, Russell J, Campbell MJ, Barker ME. Do 'food deserts' influence fruit and vegetable consumption?--A cross-sectional study. Appetite. 2005 Oct;45(2):195-7.

94. Apparicio P, Cloutier MS, Shearmur R. The case of Montreal's missing food deserts: evaluation of accessibility to food supermarkets. Int J Health Geogr. 2007 Feb 12;6:4.

95. Growing Farm Size and the Distribution of Commodity Program Payments. USDA Amber Waves. February 2005.

96. Merkel, MM. EPA and state failures to regulate CAFOs under federal environmental laws. Environmental Integrity Project. (Outline of remarks prepared for the National Commission on Industrial Farm Animal Production Meeting.) September 11, 2006. At: http://www.environmentalintegrity.org/pub401.cfm. Accessed: February 21, 2007.

97. Wilson SM, Howell F, Wing S, Sobsey M. Environmental injustice and the Mississippi hog industry. Environ Health Perspect. 2002;110(suppl 2):195-201.

98. Wing S, Cole D, Grant G. Environmental injustice in North Carolina’s hog industry. Environ Health Perspect. 2000;108:225-231.

99. United States Department of Agriculture (USDA). Trends in U.S. Agriculture: A 20th Century Time Capsule. At: http://www.usda.gov/nass/pubs/trends/timecapsule.htm. Accessed: March 5, 2007.

Re-submitted June 18, 2007.

100. U.S. Bureau of Labor Statistics (BLS). May 2005 National Occupational Employment and Wage Estimates (calculated). At: http://www.bls.gov/oes/current/oes_nat.htm#b45-0000. Accessed: March 5, 2007.

101. U.S. BLS. Table 1. Incidence rates of nonfatal occupational injuries and illnesses by industry and case types, 2005. At: http://www.bls.gov/iif/oshwc/osh/os/ostb1619.txt. Accessed: February 22, 2007.

102. Azaroff LS, Lax MB, Levenstein C, Wegman DH. Wounding the messenger: The new economy makes occupational health indicators too good to be true. Int J Health Services. 2004;34(2):271-303.

103. Rosenman KD, Kalush A, Reilly MJ, Gardiner JC, Reeves M, Luo Z. How much work-related injury and illness is missed by the current national surveillance system? J Occ Environ Med. 2006:48(4):357-365.

104. U.S. BLS. Table SNR02. Highest incidence rates of nonfatal occupational injury and illness cases with days away from work, restricted work activity, or job transfer, private industry, 2002. At: http://www.bls.gov/iif/oshwc/osh/os/ostb1233.pdf. Accessed: February 22, 2007.

105. U.S. BLS. 2005 Chart package (preliminary). "Number and rate of fatal occupational injuries by major occupation groups, 2005." At: http://www.bls.gov/iif/oshwc/cfoi/cfch0004.pdf Accessed: February 22, 2007.

106. London L, Flisher AJ, Wesseling C, Mergler D, Kromhout H. Suicide and Exposure to Organophosphate Insecticides: Cause or Effect?. Am J. Ind. Med. 2005; 47:308-321.

107. Human Rights Watch. Blood, Sweat, and Fear: Workers' Rights in U.S. Meat and Poultry Plants. 2005. Available at: http://www.hrw.org/reports/2005/usa0105/. Accessed: June 26,

Re-submitted June 18, 2007.

2006.

108. National Labor Committee. Harvest of Shame. March 12, 2007. At: http://www.nlcnet.org/article.php?id=208. Accessed: March 15, 2007.

109. Brown G. Why NAFTA failed and what's needed to protect workers' health and safety in international trade treaties. New Solut. 2005;15(2):153-80.

110. UN FAO. Agriculture accounts for 70 percent of child labour worldwide. 2006. At: http://www.fao.org/newsroom/en/news/2006/1000394/index.html. Accessed: March 15, 2007.

111. Institute for Agriculture and Trade Policy. A Fair Farm Bill for the World. 2007. At: http://www.agobservatory.org/library.cfm?refid=97624. Accessed: March 14, 2007.

112. Associated Press. EU joins WTO complaint against U.S. corn subsidies. International Herald Tribune. January 22, 2007.

113. Ray, Ugarte, Tiller. Rethinking U.S. Agricultural Policy: Changing Course to Secure Farmer Livelihoods Worldwide. University of Tennessee Agricultural Policy Analysis Center; September 2003.

114. Farm and Food Policy Project. Seeking balance in U.S. farm and food policy. January 2007. At: http://www.farmandfoodproject.org/documents/Seeking%20Balance%20final%20report%20-%20B&W.pdf. Accessed: March 9. 2007.

115. Building Sustainable Futures for Farmers Globally Campaign. Building sustainable futures for farmers globally: A call for action. February 20, 2007. At: http://www.globalfarmer.org/Uploads/sustainables%20future%20paper%20online.pdf. Accessed: March 9, 2007.

116. U.S. General Accounting Office. Livestock Agriculture: Increased EPA Oversight Will

Re-submitted June 18, 2007.

Improve Environmental Program for Concentrated Animal Feeding Operations. January 2003. GAO-03-285.

117. Centner TJ. Governmental oversight of discharges from Concentrated Animal Feeding Operations. Environmental Management. 2006; 37(6):745–752.

118. Dimitri C and Greene C. Recent Growth Patterns in the U.S. Organic Foods Market. USDA Economic Research Service (ERS) Agriculture Information Bulletin AIB777. September 2002. At: http://www.ers.usda.gov/publications/aib777/. Accessed: March 6, 2007.

119. U.S. Department of Commerce. 2007. Status of U.S. Fisheries. Available at http://www.nmfs.noaa.gov/sfa/statusoffisheries/SOSmain.htm (accessed June 13, 2007).

120. Hamilton ND. Putting a face on our food: How state and local food policies can promote the new agriculture. 7 Drake J. Agric. L. 2002; 7:407.

Submitted by:

Roni Neff, PhD, SM.

Phone: (410) 614-6027

Email: rneff@jhsph.edu.

APHA affiliations: Environment Section, Occupational Health & Safety Section

Environment Section (Jill S. Litt, PhD, Section Chair);

Food and Nutrition Section (Patricia Markham Risica, DrPH, RD, Section Chair)