

largely—but not necessarily exclusively—plant-based diet serves all three purposes, and all federal food policies and programs, including SNAP, should support it. The primers and editorial should get us thinking about how to advocate a range of food system policies that do a better job of promoting public health. Read on. **AJPH**

Marion Nestle, PhD, MPH

CONFLICTS OF INTEREST

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REFERENCES

1. IFAD, UNICEF, WFP and WHO. *The State of Food Security and Nutrition in the World*. Rome, Italy: Food and Agriculture Organization of the United Nations; 2018.
2. GBD 2015 Obesity Collaborators; Afshin A, Forouzanfar MH, Reitsma MB, et al. Health effects of overweight and

obesity in 195 countries over 25 years. *N Engl J Med*. 2017;377:13–27.

3. Vermeulen SJ, Campbell BM, Ingram JSI. Climate change and food systems. *Annu Rev Environ Resour*. 2012;37:195–222.

4. Institute of Medicine; National Research Council; Nesheim MC, Oria M, Yih PT, eds. *A Framework for Assessing Effects of the Food System*. Washington, DC: National Academies Press; 2015.


5. Nestle M, Lee PR, Baron RB. Nutrition policy update. In: Weininger J, Briggs GM, eds. *Nutrition Update*. Vol 1.

New York, NY: Wiley; 1983:285–313.

6. Bittman M, Pollan M, Salvador R, De Schutter O. A national food policy for the 21st century. 2015. Available at: <https://medium.com/food-is-the-new-internet/a-national-food-policy-for-the-21st-century-7d323ee7c65f>. Accessed March 17, 2019.

7. Swinburn BA, Kraak VI, Allender S, et al. The global syndemic of obesity, undernutrition, and climate change: the Lancet Commission report. *Lancet*. 2019;393(10173):791–846.

Primer on US Food and Nutrition Policy and Public Health: Food Sustainability

 See also Nestle, p. 985; Brownell et al., p. 988; Schwartz et al., p. 989; and Concannon, p. 991.

This section of the Primer on US Food and Nutrition Policy and Public Health deals with agricultural sustainability, which determines the type of nutrition, and therefore health outcomes, that will be offered to Americans threatened by food insecurity (Brownell et al., p. 988) and to 30 million schoolchildren (Schwartz et al., p. 989).

The farm bill is the most important vehicle for agricultural policy and a key opportunity to diversify US agriculture, make it sustainable, improve nutrition, and meet public health goals. The recent farm bill offered a mixed bag for public and environmental health, but genuine reform will require new political coalitions to champion agricultural policy that is good for people and the planet.

LINKING AGRICULTURE TO PUBLIC HEALTH

Scholars and practitioners increasingly recognize the bonds

between public health and the food system. The link runs far deeper than the food system's responsibility to provide safe and nutritious foods. Too often ignored are the policy choices that determine how the United States produces its food and the attendant public health and environmental outcomes.

Dietary choices determine more than health. They bear directly on environmental quality, especially land use; water quality; and climate change.¹ Globally, rising incomes and urbanization are driving widespread adoption of a Western diet, heavy on meat, refined sugars, and fats. Diet-related disease aside, scientists estimate such a shift in eating patterns will cause greenhouse gas emissions from agriculture—already a major source of global emissions—to rise 80% by 2050.² Household food purchases already produce 16% of total US greenhouse gas emissions.³

Dietary health and environmental health are mutually dependent, but far less attention has been paid to how environmental concerns jeopardize nutrition. For example, a growing and disturbing body of research concludes that climate change is degrading the nutrient composition of crops.⁴ Increasing atmospheric CO₂ concentrations cause crops to produce less micronutrients and less protein while increasing the proportion of sugars.⁵

In US policy circles, attempts to link public health and food sustainability meet stiff resistance. In 2015, the US Dietary Guidelines Advisory Committee recommended the inclusion of food system sustainability as part of the 2015 Dietary Guidelines, then

under development. This effort ultimately failed, yielding to agribusiness lobbyists, who were reinforced by the secretary of agriculture, who admonished the Advisory Committee for “coloring outside the lines.” This was a missed opportunity and should be corrected as work begins on the 2020 Dietary Guidelines.

Ultimately, realigning the US food system to serve the mutual ends of public health and sustainability requires an ambitious agenda far beyond the dietary guidelines, and although there is no panacea for agriculture, there is a clear imperative for the US food system to become an engine of balanced nutrition, environmental stewardship, and climate resilience.

AGRICULTURAL DIVERSITY

Crop diversification is a useful proxy for progress toward these goals. Farms that raise a diversity of crops (and animals) using

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agroecological principles contribute to public health by fostering more variety in the diet by emphasizing nutrient-dense foods and by enhancing the climate resilience of food sources.⁶ When they are embedded in local food systems, such farms help expand the availability of culturally appropriate foods, help restore traditional food practices, decrease reliance on processed foods, and connect people to the farmers whose agricultural practices contribute to the care or detriment of environmental health.

Encouraging more diversified agriculture means moving beyond the paradigm of planting vast monocultures and relying on industrial animal feeding operations for meat production. Public and planetary health require a move toward resource-conserving crop rotations, reintegrating animals back into crop systems, and widely adopting agroecological and regenerative practices. These practices mitigate climate change by leaving and sinking greenhouse gasses in the soil, but they also improve resilience against the climate disruptions already under way.

Many conservation practices can be incorporated into conventional agriculture systems, where sheer scale means that even small changes play an outsized role in improving agricultural sustainability. Existing federal programs demonstrate that large, conventional farms will adopt new practices if given the right policy incentives. They will also grow different (i.e., more nutritious) crops if there is sufficient demand downstream for the changes to make economic sense.

THE 2018 FARM BILL

The 2018 Farm Bill is a mixed bag for farmers who prioritize

sustainability through crop diversification. Consider three examples—drawn from the Farm Bill's Nutrition, Horticulture, and Conservation sections, respectively—of farm bill programs that support sustainable production.

First, the Food Insecurity Nutrition Incentives program provides cash incentives to encourage the purchase of fresh fruits and vegetables with Supplemental Nutrition Assistance Program (SNAP) benefits (Brownell et al., p. 988). In addition to improving nutrition among SNAP families, this mutually beneficial program can bolster diversified farms by increasing purchases by SNAP recipients at local farmers markets. In renaming it the “Gus Schumacher Nutrition Incentives Program” in honor of its late champion, the new farm bill gives the Food Insecurity Nutrition Incentives program permanent status and provides \$536 million over 10 years. The Food Insecurity Nutrition Incentives program remains a small program by farm bill standards, but it proves the concept that thoughtful public programs can pay double dividends to public health and sustainable agriculture.

Second, the past several farm bills included programs to help diversified farms access local markets. Farmers can receive support in opening and operating farmers markets, adding value to the crops they grow and building infrastructure to support regional food systems. By rolling several smaller programs into the new Local Agriculture Market Program, the 2018 Farm Bill provides permanent, mandatory funding for these initiatives. This is a significant win for farmers and consumers.

Third, working lands conservation programs encourage farmers to adopt more sustainable practices or technologies. The Conservation

Stewardship Program, which distinguishes itself as the only conservation program that facilitates a comprehensive stewardship approach across whole farms, provides cost share for diversification practices such as adopting resource-conserving crop rotation or planting cover crops. The House's version of the 2018 Farm Bill would have eliminated the Conservation Stewardship Program, but fortunately the final version maintained the program. Unfortunately, the Conservation Stewardship Program took a \$3.6 billion cut over 10 years, and conservation funding overall retained the \$6 billion cut from the 2014 Farm Bill.

Despite these relative “victories,” the 2018 Farm Bill continues a decades-long trend of providing massive support for monoculture farming while leaving diversified and sustainable agriculture to fight over the crumbs. The result is a food system that remains yoked to processed foods and unprepared to weather the gathering storm of environmental threats.

UNITED FRONT

Promoting a sustainable and nutritious diet for American families will require a much closer partnership between advocates for sustainable agriculture and public health practitioners. In recent farm bills, public health advocates remained narrowly focused on protecting and promoting SNAP and remained silent on significant questions of agricultural policy. This strategy succeeded in excluding provisions from the bill that would have tightened work requirements on SNAP recipients. Meanwhile, working lands conservation absorbed a body blow,

and commodity and crop insurance policy further entrenched an agricultural system tailored to overproduce inexpensive, unsustainable, processed foods.

AGRICULTURAL SUSTAINABILITY AND DIET

Considering the interdependence of agriculture and nutrition, the public health community cannot remain passive on questions of agricultural policy. During the 2015 debate on sustainability in the dietary guidelines, a group of scholars argued that embracing the connections between agricultural sustainability and diet could awaken new political coalitions and also highlight that government can and should take a more hands-on role in ensuring food system sustainability.⁷ It is time to answer that call. By working together, public health and sustainable agriculture groups can shepherd reforms that realign US agricultural policy with the health of our citizens and environment. **AJPH**

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REFERENCES

1. Willett W, Rockström J, Loken B, et al. Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *Lancet*. 2019;393(10170):447–492.
2. Tilman D, Clark M. Global diets link environmental sustainability and human health. *Nature*. 2014;515(7528):518–522.

3. Boehm R, Wilde PE, Ver Ploeg M, Costello C, Cash SB. A comprehensive life cycle assessment of greenhouse gas emissions from U.S. household food choices. *Food Policy*. 2018;79(C):67–76.


4. Evich HB. The great nutrient collapse. 2017. Available at: <https://www.politico.com/agenda/story/2017/09/13/food-nutrients-carbon-dioxide-000511>. Accessed February 20, 2019.

5. Myers SS, Zanobetti A, Kloog I, et al. Increasing CO₂ threatens human nutrition. *Nature*. 2014;510(7503):139–142.

6. Leib EB, Chan A, Miller DL, et al. Diversified agricultural economies. 2018. Available at: http://www.farbillaw.org/wp-content/uploads/2018/03/FBLE_Diversified-Agricultural-Economies_Final.pdf. Accessed February 20, 2019.

7. Merrigan K, Griffin T, Wilde P, Robien K, Goldberg J, Dietz W. Designing a sustainable diet. *Science*. 2015;350(6257):165–166.

Primer on US Food and Nutrition Policy and Public Health: Food Assistance

 See also Nestle, p. 985; Miller et al., p. 986; Schwartz et al., p. 989; and Concannon, p. 991.

In the food assistance section of this US food and nutrition policy primer, we focus on inadequate access to healthy food, a problem that fuels the dual burden of food insecurity and obesity. Vast numbers of Americans are affected, with staggering public health consequences.¹ Nearly 12% of all American households, and almost 18% of children younger than 18 years, experience food insecurity. At the same time, 20% of American children are overweight or obese, triple the number from the 1970s, and two thirds of adults are overweight or obese, with a cascade of associated medical, social, and economic disadvantages. In the other editorials in this series, we address agriculture (p. 986) and school nutrition (p. 989).

Getting food right is essential for the health and vitality of the nation. This broad and complex task involves numerous matters, beginning with the way food is produced and ending with food being consumed or lost. Among the most pressing issues, in the past and the present, is helping people in need receive access to nutritious and affordable food.

Economic and social circumstances can make it difficult for individuals and families to afford healthy food, with tragic consequences. Parents face agonizing decisions about how food is parceled among their children when they themselves go hungry. Paying for food versus heat versus medicine can become a daily struggle.

Children convey the saddest story of all. Inadequate nutrition during critical stages of child development amounts to a life sentence, because key cognitive and other functions will never recover. Children may be too tired or depleted to learn in school, are more vulnerable to illness, and can begin a cycle of falling behind that never ends.

SNAP AND WIC

The US government can and has responded in compassionate ways, by supporting a variety of food assistance programs. Two of the key programs are SNAP (Supplemental Nutrition Assistance Program, formerly known as food stamps) and WIC (Special Supplemental Nutrition Program

for Women, Infants, and Children). Both programs have highly beneficial effects and are cost-effective but are under constant pressure from those who oppose the programs on fiscal, political, or moral grounds. It is all that proponents of these programs (e.g., champions in Congress, a variety of nongovernmental organizations) can do to protect the programs from monetary cuts, which makes needed growth and improvement of the programs an elusive goal.

SNAP is the largest part of the massive Farm Bill, passed by Congress approximately every five years. In December 2018, after a grueling multiyear fight, Congress passed the most recent Farm Bill, estimated by the Congressional Budget Office to cost \$867 billion over 10 years: \$664 billion, or 77% of the overall cost, is for nutrition programs, mostly for SNAP.

Approximately 40 million people participate in SNAP. The strong bipartisan support for the Farm Bill indicates a convergence of interests of traditional agriculture with those of both urban and rural areas where food and nutrition policies are pressing.

WIC, authorized originally under the Child Nutrition Act of 1966 and currently under the Healthy and Hunger-Free Kids Act of 2010, provides supplemental nutrition foods, nutrition education and counseling, and screening and referral to mothers during and after pregnancy and during breastfeeding and to non-breastfeeding postpartum mothers, infants, and children up to their fifth birthday. WIC reaches approximately 7.3 million women, infants, and children each month and serves 53% of all infants born in the United States. Annual costs in 2017 were \$5.6 billion.

In the most recent iteration of the Farm Bill, the opponents made predictable and serious threats not only to reduce benefits but also to change eligibility, notably by increasing work requirements in ways that would reduce benefits to as many as two

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