



Helping Americans Eat More of the Good Stuff

*A Systems-Wide Approach to Increasing
Fruits and Vegetables and the Impact on
Public Health, the Economy and the Environment*



March 2015

Eat More Fruits and Vegetables: It's Good For You ... and For All of Us

Eat more fruits and vegetables. For more than 50 years healthcare professionals have made that simple recommendation to help patients stay healthy, and the American Heart Association has made it a centerpiece of its advice to improve the nation's health.

This recommendation is as true today as it was five decades ago because science continues to show health benefits. Fruits and vegetables help people reduce low-density lipoproteins (more commonly known as “bad” cholesterol), lower blood pressure and maintain healthy weight.¹

Fruits and vegetables, as part of a healthy overall dietary pattern, can substantially lower risk for cardiovascular diseases, stroke, diabetes and other health problems. These benefits are proven in diets emphasizing fruits and vegetables, whole grains, low-fat dairy products, poultry, fish, legumes, non-tropical vegetable oils and nuts – but limited in sweets, sodium, sugar-sweetened beverages and red meats. Increasing fruit and vegetable consumption alone can reduce the risk of cardiovascular diseases and stroke by 20 percent.²

Based on this compelling evidence, the American Heart Association recommends adults eat 4-5 servings of fruit and 4-5 servings of vegetables per day.³ (That comes out to approximately 4½ cups of each.) This is similar to the recommendations in the

¹ 2013 AHA/ACC Guideline on Lifestyle Management to Reduce Cardiovascular Risk, A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines, Management to Reduce Cardiovascular Risk. 2013.
<http://circ.ahajournals.org/content/suppl/2013/11/07/01.cir.0000437740.48606.d1.DC1>

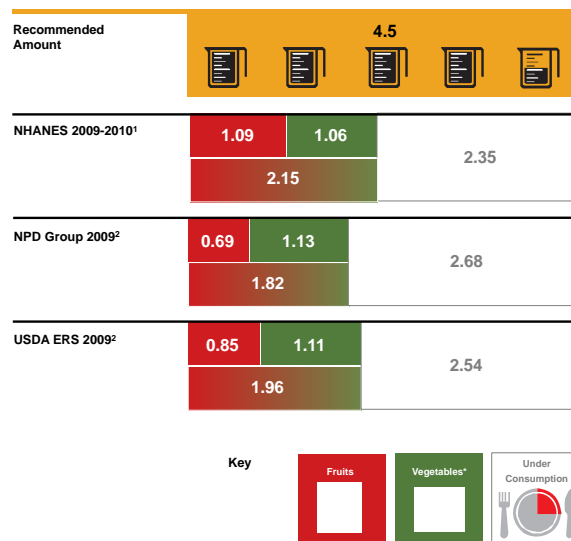
² He, F.J., et al., Increased consumption of fruit and vegetables is related to a reduced risk of coronary heart disease: meta-analysis of cohort studies. *J Hum Hypertens*, 2007. 21(9): p. 717-28.

³ http://www.heart.org/idc/groups/heart-public/@wcm/@fc/documents/downloadable/ucm_467681.pdf

federal government’s Dietary Guidelines for Americans.⁴ Even when people can’t reach those totals, there are benefits to eating fruits and vegetables. Just 2½ cups of fruits and vegetables per day could reduce the risk of heart attack and stroke.⁵

Getting people to eat enough fruits and vegetables has been a problem historically. By 1999, it became clear that education efforts could only go so far, and that more work is needed to overcome the barriers of access, affordability and appeal. For nearly 15 years, intake levels have been at about half the recommended intake, various studies have found. Here is as quick look at some of those findings:

Average U.S. Per Capita Fruit and Vegetable Consumption in Cups



⁴Dietary Guidelines for Americans 2010. U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010
http://www.cnpp.usda.gov/sites/default/files/dietary_guidelines_for_americans/PolicyDoc.pdf

⁵ Dietary Guidelines for Americans 2010. U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010.
http://www.cnpp.usda.gov/sites/default/files/dietary_guidelines_for_americans/PolicyDoc.pdf

- The National Health and Nutrition Examination Survey (NHANES), performed by the National Center for Health Statistics at the Centers for Disease Control and Prevention since the 1960s, estimates current intake at 2.15 cups per day based on its survey of the dietary intake of 5,000 individuals.⁶ NHANES is widely accepted as an accurate estimate of dietary intake by the public health and nutrition community. Historic NHANES estimates may have been low based on prior underreporting of actual intake.
- The Produce for a Better Health Foundation found that average consumption has held relatively steady since 1999, at a slightly lower level of between 1.75 and 1.83 cups per day. That finding is based on an analysis of the NPD Nutrient Intake Database that tracks the self-reported eating habits of 5,000 individuals, a study performed since 1980. The NPD Group (formerly the National Purchase Diary) is a private company that has tracked consumer behaviors and retail sales since 1967.
- The Economic Research Service of the U.S. Department of Agriculture (ERS) publishes an ongoing estimate of fruit and vegetable consumption in the U.S. based on the availability of fruits and vegetables. That estimate shows a higher level of availability, at over 2½ cups, before accounting for waste and spoilage. It also shows a greater rate of increase until 1999, followed by a decline.⁷

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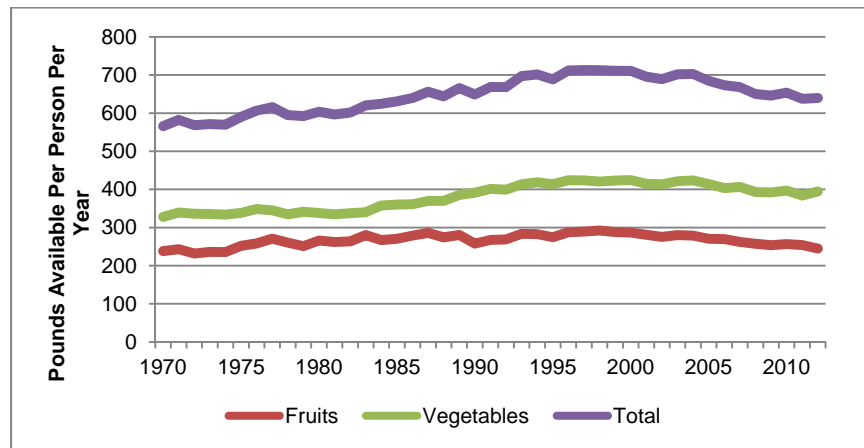
⁶ NHANES 2009-2010, Individuals age 2+ years, day 1 dietary intake date, weighted. Food Patterns Equivalents Database (FPED) 2009-2010.

⁷ U.S. Department of Agriculture Economic Research Service, Fruits and vegetables (fresh weight equivalent): Per capita availability, 1970-2012.
[http://www.ers.usda.gov/data-products/food-availability-\(per-capita\)-data-system/.aspx](http://www.ers.usda.gov/data-products/food-availability-(per-capita)-data-system/.aspx)

⁸ U.S. Department of Agriculture Economic Research Service, Average daily intake of food by food source and demographic characteristics, 2007-10,
<http://www.ers.usda.gov/data-products/food-consumption-and-nutrient-intakes.aspx>

No matter which data are used, fruit and vegetable consumption remains well below recommendations associated with optimal health. The low levels of fruit and vegetable consumption, despite consistent recommendations and persistent health messaging, shows the need for a new and innovative approach in the U.S. and worldwide.

Fruit and Vegetable Availability per Person in Pounds⁹



Meanwhile, the annual cost of health care has risen in the U.S. to \$2.8 trillion, or nearly 18 percent of gross domestic product, the highest among Western countries.¹⁰ Nearly 70 percent, or about \$2 trillion, is spent to treat lifestyle-related diseases, and diseases associated with dietary risk now account for 26 percent of all deaths in the U.S.¹¹ Private spending on health care also is the highest

⁹ Bentley, Jeanine, Food Availability (Per Capita) Data System, U.S. Department of Agriculture Economic Research Service, December 2014, [http://www.ers.usda.gov/data-products/food-availability-\(per-capita\)-data-system/.aspx](http://www.ers.usda.gov/data-products/food-availability-(per-capita)-data-system/.aspx)

¹⁰ Noreen, Cliff, 2014 Economic & Market Update, Tower Square Capital Partners Annual Meeting Babson Capital Management, LLC. May 6, 2014

¹¹ The State of US Health, 1990-2010: Burden of Diseases, Injuries, and Risk Factors US Burden of Disease Collaborators, JAMA. 2013;310(6):591-606. O' doi:10.1001/jama.2013.13805

among Western nations, at a time when average household incomes have declined.¹²

Over these same years, agricultural and livestock production have caused significant environmental problems. In the U.S., the average rate of red meat consumption is far above the global average and among the highest in the world.¹³ Emissions from agricultural and livestock production processes have contributed to climate change,¹⁴ and livestock and their feed have degraded water resources.

On the other hand, diets with more fruits and vegetables and lesser amounts of other foods, notably animal proteins, can benefit the U.S. economy. Such a diet also would lessen the burden on the environment sooner than other measures, such as changing the power, transportation or water infrastructure.

This importance of food to our health, environment and economy is well established in the scientific literature, and changes in dietary patterns are associated with diverse impacts across multiple sectors. The Institute of Medicine recently established *A Framework for Assessing Effects of the Food System* to inform understanding of these broad yet integrally interconnected

¹² Noreen, Cliff, 2014 Economic & Market Update, Tower Square Capital Partners Annual Meeting Babson Capital Management, LLC. May 6, 2014

¹³ FAO 2013, Current Worldwide Annual Meat Consumption per capita, Livestock and Fish Primary Equivalent, Food and Agriculture Organization of the United Nations, viewed 31st March, 2013, <http://faostat.fao.org/site/610/DesktopDefault.aspx?PageID=610#ancor>.

¹⁴ Ta Gerber, P.J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., Faluccci, A. & Tempio, G. 2013. Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities. Food and Agriculture Organization of the United Nations (FAO), Rome. <http://www.fao.org/3/8d293990-ea82-5cc7-83c6-8c6f461627de/i3437e.pdf>

relationships.¹⁵

The framework provides decision makers with a basis to understand and analyze effects, weigh tradeoffs and guide decision making within the complicated and dynamic food environment. This work supports and drives the American Heart Association’s decision to initiate a “systems approach” and coordinated planning effort across multiple sectors including health care, environment, conservation, private investment, food and agriculture to develop a blueprint that will increase fruit and vegetable intake by an average of 2½ cups per person over the next decade.

Mind the Gap

Moving toward a diet that includes 4½ cups of fruits and vegetables per day – while reducing consumption of red meats, refined grains, sodium, added sugars and sugar-sweetened beverages – can deliver benefits to our health, the health of our economy and the health of our planet.

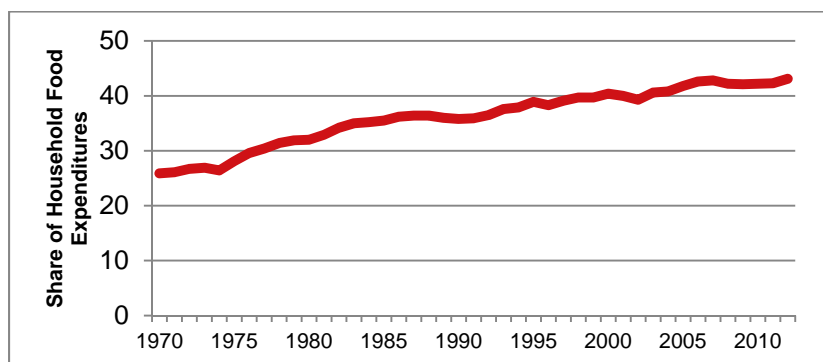
The fact that consumption of fruits and vegetables has stagnated since 1999 may show the limits of public awareness efforts by themselves. But they also may be a reflection of the changes in the way we eat.

Americans are eating fewer meals prepared at home and have nearly doubled spending on meals prepared by food industry professionals. Nearly half of our food dollars are spent on prepared meals rather than uncooked individual items, such as fresh fruits and vegetables.¹⁶

¹⁵ Nesheim, Malden C., et al, *A Framework for Assessing Effects of the Food System*, Institute of Medicine National Academies Press, 2015.

¹⁶ Changing Tastes analysis of USDA annual food expenditures studies, 1954-2012 and National Restaurant Association annual reviews, 2007-2012.

Share of Household Food Expenditures on Meals Away from Home¹⁷



The way we buy fruits and vegetables also has changed. Grocery retailers now offer restaurant-style meals, which have become the fastest-growing part of their stores. That means stores and restaurants – not individual consumers – are making more of the decisions about where fruits and vegetables fit into a meal.

Grocery retailers also have increased their emphasis on seasonal offerings, importing a wider variety of fruits and vegetables during their peak growing seasons. Also, offerings have grown among branded fresh and frozen products. And there has been an even more dramatic increase in easy-to-serve products such as bagged salads and pre-cut fruits and vegetables. Both provide higher-quality nutrition and convenience, replacing the need to buy several kinds of fresh, whole or minimally processed produce.

All of this selection and convenience adds value for the consumer, but it has come at increased cost. Spending on fruits and

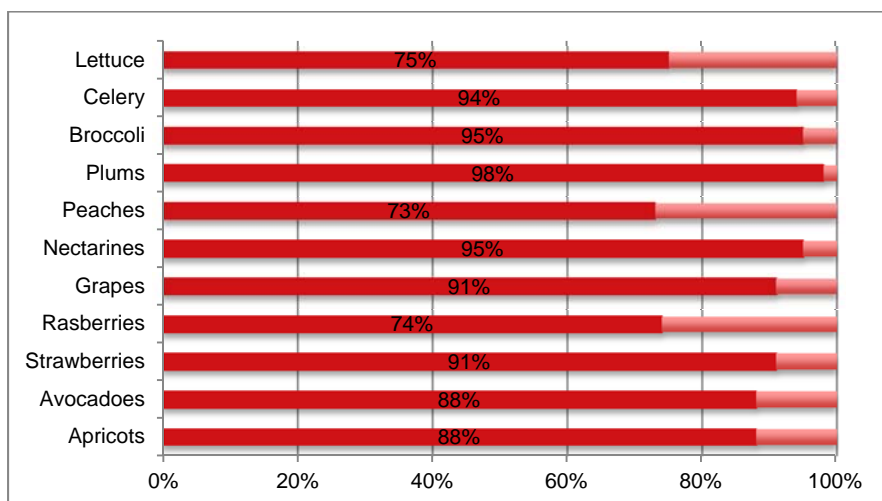
¹⁷ U.S. Department of Agriculture Economic Research Service annual food expenditures studies, <http://www.ers.usda.gov/topics/food-choices-health/food-consumption-demand/food-away-from-home.aspx>

vegetables has grown, however, the spending has been for more convenience than for more fruits and vegetables.¹⁸

Increasing Capacity and Food System Challenges

Fruit and vegetable production has undergone significant change, with the continued expansion of production scale agriculture in California, which now supplies the largest share of many popular fruits and vegetables.

Share of Popular Fruits and Vegetables from California¹⁹



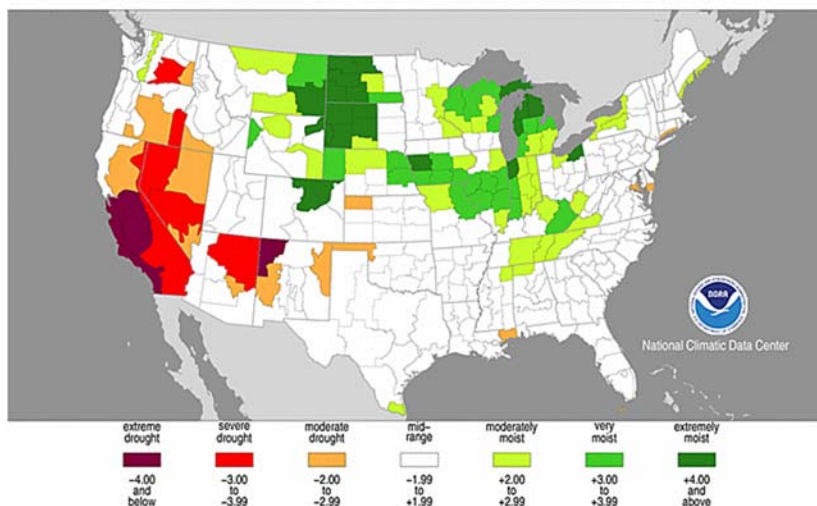
California's primary agricultural regions have suffered from an intensive, multi-year drought in recent years. This has forced farmers to turn to groundwater resources to make up the shortage in rainfall, depleting the state's water reserves and driving up prices. This drought has been long predicted by climate scientists, and

¹⁸ Bentley, Jeanine, Food Availability (Per Capita) Data System, U.S. Department of Agriculture Economic Research Service, December 2014, [http://www.ers.usda.gov/data-products/food-availability-\(per-capita\)-data-system/.aspx](http://www.ers.usda.gov/data-products/food-availability-(per-capita)-data-system/.aspx)

¹⁹ U.S. Department of Agriculture Economic Research Service, California Drought 2014: Farm and Food Impacts, 2014. <http://ers.usda.gov/topics/in-the-news/california-drought-2014-farm-and-food-impacts/california-drought-2014-crop-sectors.aspx#caveggiesandmelons>

growing conditions are unlikely to improve for at least several decades, if ever.

Palmer Modified Long-Term Drought Index²⁰



The combination of climate change and increased reliance on California’s agricultural sector have made the nation’s annual harvest of fruits and vegetables less certain, while driving up price volatility.

The Next 2½ Cups

An effective strategy to close the fruit-and-vegetable gap over the next decade must improve all aspects of our food system.

Several new approaches have emerged, including new business models for farm-direct sales, prescriptions for fruits and vegetables, the expansion of agricultural production to other parts of the country, innovations in technologies to enhance growing conditions and extend growing seasons, private and public sector

²⁰ National Drought Information System, November 2014, <http://www.drought.gov/drought/content/what-nidis/trackback>

purchasing policies, and commitments by larger restaurant and foodservice companies to serve more fruits and vegetables.

There also has been an increase in innovation among public-sector efforts, notably the substantial changes in school lunch programs along with financial incentives for the purchase of fresh fruits and vegetables such as the SNAP pilot “double up food bucks” program. But most of these efforts are pilot programs and receive modest levels of funding and support, or they are in the early stages of implementation.

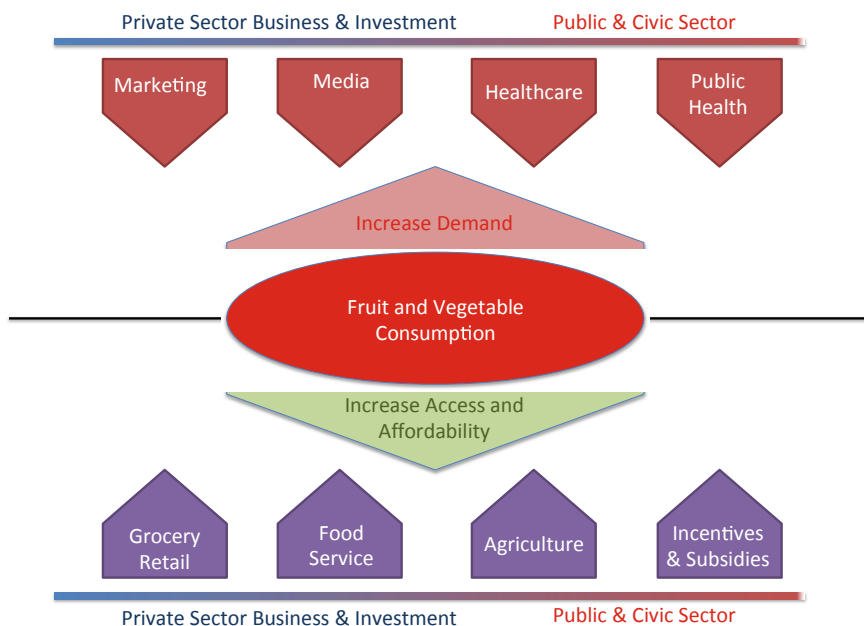
While showing great promise, no single effort has significantly increased consumption. Taken together, they show the greater potential of efforts that work to simultaneously improve production and access, along with continued public awareness and education efforts.

Which Comes First: The Fruit or the Seed?

While the public health community’s primary focus has been to increase awareness, others have worked to improve agricultural conditions and increase access to fruits and vegetables.

All have achieved some level of success and relied on some common approaches, including improving public policy and educating the public while also seeking to leverage the powerful influence of private investment, medical expertise, and consumer media and marketing channels.

Public and Private Sector Efforts to Promote Public Health, Agricultural Production and Economic Development Impact Fruit and Vegetable Consumption



The success in each arena has come in part from the periodic intersection of efforts to shape public policy, influence business and investment decisions, and affect the system that provides production, access and demand for fruits and vegetables.

Keys to a Successful Harvest

Increasing fruit and vegetable consumption in the U.S. by about 2½ cups per day per person will require a new, breakthrough strategy. This approach must involve a systems-wide approach and coordination among leaders in public health, health care, public policy, finance and business.

A wide variety of stakeholders will benefit significantly from improvements in our nation’s health, the economy and the environment. The keys to success are to drive change in existing

systems and to promote innovative approaches at a time of growing risks to the nation’s health, economy and the environment.

Rising risk can be seen as a reason not to change. But increasing fruit and vegetable consumption has the unique power to help reduce these very risks. A new strategy must work to improve the food sector in several key areas, including:

Fruit and Vegetable Production

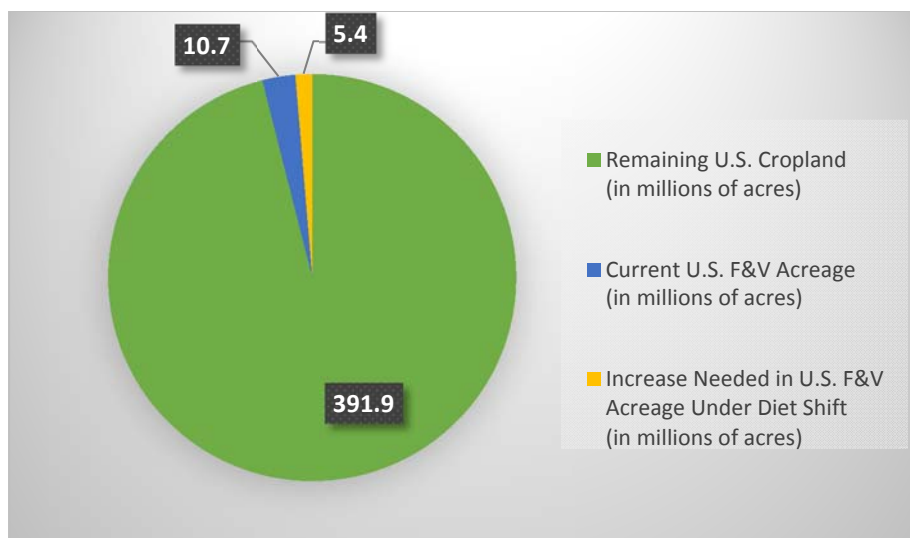
Increase the ability to produce and supply a larger share of U.S. fruits and vegetables.

The U.S. grows crops on 408 million acres of land, 10.7 million of which are devoted to fruits and vegetables. If that acreage were increased by 50 percent (16.1 million acres), the U.S. could produce enough fruits and vegetables for Americans to consume recommended levels, according to the Union of Concerned Scientists.²¹ That represents a change of 1 percent to 2 percent of the nation’s crop acreage. That is less than the amount of cropland that could be freed up from producing animal feed with even a modest reduction in red meat consumption of less than one half serving per day.²²

²¹ Union of Concerned Scientists, The Healthy Farmland Diet Report, October 2013
http://www.ucsusa.org/sites/default/files/legacy/assets/documents/food_and_agriculture/healthy-farmland-diet.pdf

²² Changing Tastes, 2014.

Growing Enough Fruits and Vegetables Requires a Small Shift in How U.S. Farmland is Used — Union of Concerned Scientists²¹



Increasing fruit and vegetable production while adjusting to new growing conditions creates a new investment opportunity. Delivering a more dependable harvest under changing growing conditions, including more volatile weather and declining freshwater resources, will require expanding fruit and vegetable production beyond just a few parts of the country.

Public policy changes that better align agricultural incentives and supports with the nation’s dietary needs for better public health will speed the increase of fruit and vegetable production while helping to reduce cost for consumers and businesses.²³ This includes important changes in existing crop promotion programs to allow farmers to grow fruits and vegetables

²³ Balagtas, J.V., B. Krissoff, L. Lei, and B.J. Rickard. 2014. How has U.S. farm policy influenced fruit and vegetable production? *Applied Economic Perspectives and Policy* 36(2): 265-286.

as well as other commodity crops without foregoing public incentives and supports.

It will require expanding processing and distribution equipment and capacity in new areas, creating opportunities for investment in many parts of the country. Improving the processing and distribution system will reduce the amount of food waste; today fresh and perishable fruits and produce often spoil before being used.

These improvements also will help to reduce the price of fruits and vegetables, a substantial barrier to consumption.

Raising domestic production rates to match the recommended dietary patterns is critical to avoid the international price impacts from boosting U.S. prices along with adverse impacts on the today diets of other countries.²⁴

Grocery Retail and Foodservice

Increase access and consumption of fruits and vegetables.

Improving access will require a change in the foods provided by both the grocery retail and the foodservice segments, with each now providing a similar share of the nation's diet.

Both sectors must continue innovation in their menus and recipes and increase the convenience of eating fruits and vegetables. This includes specific changes to include fruits and vegetables more often in more dishes, rather than segregating them in to separate parts of their food offerings.

The continued expansion of brand marketing strategies to fruits and vegetables also leverages proven methods to shift purchasing habits in grocery retail. Similarly, the expansion of

²⁴ O'Hara, Jeffrey, unpublished communication, 2014.

public policies and incentives to increase the availability of fruit and vegetables especially in noncommercial foodservice venues, such as public schools and government dining halls can increase access while providing guaranteed demand to support the expansion of fruit and vegetable production in new parts of the country.^{25 26 27}

Both segments also can leverage new strategies around choice architecture, combining information technology and physical design to change the ways consumers decide where to get food and what they choose to eat.²⁸

The increase in fruit and vegetable production across the country, coupled with reduced time from harvest to sale, contribute to the success of these new business efforts. This scenario also matches the grocery shopper's growing interest in fresh and local foods while significantly improving the economics of increasing the use of perishable foods.

²⁵ Pansing, et al, *Roadmap for City Food Sector Investment and Innovation*, City of San Francisco Planning Department, 2013. <http://www.sf-planning.org/index.aspx?page=3540>

²⁶ Dong, D., and E. Leibtag. 2010. Promoting fruit and vegetable consumption: Are coupons more effective than pure price discounts? ERR 96. Washington, DC: USDA Economic Research Service.

²⁷ Klerman, J.A., S. Bartlett, P. Wilde, & L. Olsho. 2014. The short-run impact of the healthy incentives pilot program on fruit and vegetable intake. *American Journal of Agricultural Economics* 95(5):1372-1382.

²⁸ Just, D.R., J. Lund, and J. Price. 2012. The role of variety in increasing the consumption of fruits and vegetables among children. *Agricultural and Resource Economics Review* 41(1): 72-81.

Health Care and Health Advice

Leverage medical advice and health and wellness incentive programs to promote increased consumption of fruits and vegetables.

Public health education and medical advice continue to be important supports for fruit and vegetable consumption, requiring the continued efforts of researchers and practitioners.

Recent research studies have shown that eating healthy and particularly, fruits and vegetables consumption can have a significant improvement in health.²⁹ Furthermore, U.S. businesses are increasingly seeing the value of healthy foods in the workplace and improved productivity in the labor force while reducing costs in health care.³⁰

Changes in the U.S. model of healthcare provision and structural changes in the healthcare industry offer new opportunities to align financial incentives at all levels with increasing fruit and vegetable consumption.

Individuals can be rewarded for eating more fruits and vegetables through expansion of incentives such as the “Double Up” program for SNAP recipients, individual tax and other savings from fruit and vegetable prescription programs, and workplace programs to offer fruits and vegetables to eat at home at a reduced costs. Healthcare companies can realize lower costs from improving the health of their client populations, including the cost of treating chronic diseases related to dietary intake.

²⁹ Chatterjee A. and Kubendran, S. Drink Different: Feasible Strategies to Reduce Obesity, Milken Institute, 2015.

³⁰ Goetzel RZ, Henke RM, Tabrizi M, et al. Do workplace health promotion (wellness) programs work? J Occup EnvironMed. 2014;56(9):927-934.

Health insurance companies also can realize similar benefits by incenting and investing in efforts to increase fruit and vegetable consumption.

Aligning healthcare programs will also require continued research into the impacts of dietary change in individuals and large populations.

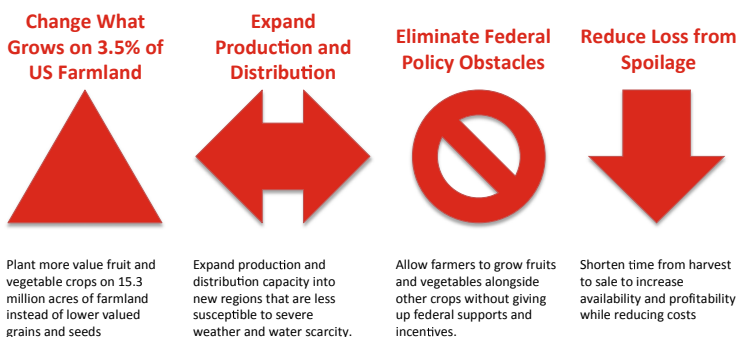
Medical and nutrition professionals also must continue to be the most trusted sources of advice on what to eat.³¹ The profession will need to continue to emphasize what to eat, not just what to avoid. Increasingly, healthcare professionals can reach broader audiences through mainstream and social media, and provide the same advice.

Closing the Gap

Achieving this goal in 10 years will require:

- More than doubling domestic production by shifting about 3 percent of American farmland to grow more valuable fruits and vegetables.
- Expanding production, processing and distribution in many regions of the country to adapt to climate change and limited water resources.
- Reducing the cost of fruits and vegetables through changes in federal programs so more farmers can grow more valuable fruit and vegetables alongside other commodity crops.
- Reducing food lost to spoilage by shortening the time from harvest to sale, which also increases availability and reduces cost.

³¹ Harris: A Nielsen Company, *The Harris Poll, 2013*.
<http://www.harrisinteractive.com/NewsRoom/HarrisPolls/tabid/447/ctl/ReadCustom%20Default/mid/1508/ArticleId/1349/Default.aspx>



Harvesting the Results

Increasing fruit and vegetable consumption to 4½ cups per day within the next 10 years benefits our nation’s health, our economy and our planet. This single change also represents a unique opportunity to deliver these benefits while reducing economic and environmental costs compared to many other proposals for reducing disease, addressing climate change or ensuring water supplies.

Improvement in our nation’s health.

Dietary risks are the leading cause of disease burden in the U.S. and also the leading cause of preventable death, accounting more than a quarter of all deaths per year, a total of more than 678,000.³² People who eat recommended levels of fruits and vegetables have 20 percent lower rates of cardiovascular diseases and stroke, as well as lower levels of diabetes.³³ ³⁴ While current comparative studies confirm the benefits of more fruits and

³² The State of US Health, 1990-2010: Burden of Diseases, Injuries, and Risk Factors US Burden of Disease Collaborators, JAMA. 2013;310(6):591-606. doi:10.1001/jama.2013.13805

³³ He, F.J., et al., Increased consumption of fruit and vegetables is related to a reduced risk of coronary heart disease: meta-analysis of cohort studies. J Hum Hypertens, 2007. 21(9): p. 717-28.

³⁴ He, F.J., C.A. Nowson, and G.A. MacGregor, Fruit and vegetable consumption and stroke: meta-analysis of cohort studies. Lancet, 2006. 367(9507): p. 320-6

vegetables, current epidemiologic findings cannot confirm when the same benefits might be realized in populations that change their diets. However, even a 5 percent to 10 percent reduction in the instances of cardiovascular diseases, stroke and diabetes represent significant public health benefits, resulting in between more than 39,000 and nearly 80,000 avoided deaths and could be as much as 2.2 million and 4.43 million less cases suffering from these diseases.

Rates of Death from Dietary Risk

Disease	Deaths	5% Reduction	10% Reduction
Cardiovascular Diseases	596,577	29,829	59,658
Stroke	128,932	6,447	12,893
Diabetes	73,831	3,692	7,383
Total Avoided Deaths	—	39,967	79,934

Disease Due to Dietary Risk (2008-2010)

Disease	Number of Cases ³⁵	5% Reduction In Cases	10% Reduction In Cases
Heart Diseases	19.4, million	970,000	1,940,000
Stroke	3.7 million	185,000	370,000
Diabetes	21.2 million	1,060,000	2,120,000
Total Avoided Cases of Disease*	—	2,215,000	4,430,000

*Assuming no comorbidities.

³⁵ Chatterjee, Anusuya , Kubendran, Sindhu , King, Jaque , and DeVol, Ross, Checkup Time: Chronic Disease and Wellness in America, Jan 29, 2014, <http://www.milkeninstitute.org/publications/view/618>

Economic benefits.

This economic return benefits three major parts of the nation’s economy:

Lower healthcare costs.

The annual reduction in medical treatment costs from a 5 percent to 10 percent reduction in heart disease, stroke and diabetes would be between \$7.6 billion and \$15.3 billion per year.

Avoided Medical Treatment Costs (2008-2010)

Disease	Cost of Treatment Per Person/Year ³⁶	Avoided Cost from a 5% Reduction in Cases	Avoided Cost from a 10% Reduction in Cases
Heart Diseases	\$4,506.30	\$4,371,111,000	\$8,742,222,000
Stroke	\$5,400.80	\$999,148,000	\$1,998,296,000
Diabetes	\$2,147.70	\$2,276,562,000	\$4,553,124,000
Total Avoided Cost of Treatment	—	\$7,646,821,000	\$15,293,642,000

Reduced indirect economic burden due to higher rates of workforce productivity.

Employees suffering from ailments miss workdays, a situation known as absenteeism, or perform far below their potential, which is called presenteeism. Informal caregivers for such patients also experience absenteeism and presenteeism. As a result, businesses suffer and the productivity of the entire economy declines, along with GDP. The decline in GDP can have future negative implications. So, along with measuring healthcare cost associated

³⁶ Chatterjee, Anusuya , Kubendran, Sindhu , King, Jaque , and DeVol, Ross, Checkup Time: Chronic Disease and Wellness in America, Jan 29, 2014, <http://www.milkeninstitute.org/publications/view/618>

with a disease, an evaluation of the indirect economic burden of disease should incorporate the broader effects of premature death and diminished capacity of patients and caregivers to contribute to economic growth. Improved quality of life and higher survival rates due to more fruits and vegetables consumption contribute to significant economic gains. A sizable amount of survivors will return to workforce at some point and contribute to economic growth (through increase in GDP).

Lower costs to reduce greenhouse gas emissions.

Shifting dietary intake to increase fruit and vegetable consumption and reducing consumption of animal proteins, including red meats, significantly reduces associated greenhouse gas emissions, including the impact of growing crops for animal feed.

Increasing fruit and vegetable consumption to 4½ cups per day while reducing protein consumption to the Recommended Daily Allowance and maintaining the current mix of protein sources would avoid over 400 million kilograms of CO₂-equivalent emissions³⁷, representing a current value of over \$4.9 billion.³⁸

This reduction equals about 23 percent of current U.S. greenhouse gas emissions-reduction targets. However, investment to achieve these reductions are modest by comparison, involving replanting 3 percent of U.S. farmland, improving produce supply chain efficiencies, and reworking agriculture policies while maintaining current incentives and supports. And these costs are quickly recouped through avoided healthcare costs as compared to

³⁷ Gardner, Christopher and Wasserman, Arlin, Protein, presented at the Stanford Medical School Food Summit 5, October 29, 2014.

³⁸ Value of emissions reduction based on value of carbon emissions allowance traded on the Intercontinental Exchange, priced as of December 12, 2014. <http://calcarbodash.org>

other strategies to achieve these reductions including paying to install emission control devices in power generation facilities, switching fuel sources, and retrofitting existing buildings.

Increased profits from reducing waste from the spoilage.

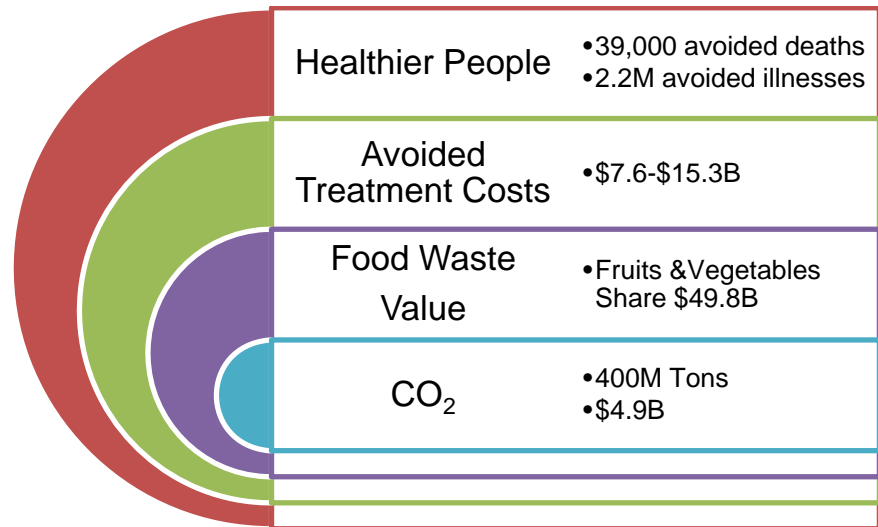
Improvements to processing and distribution will shorten the time from harvest to sale, reducing the amount of food loss from spoilage, increasing the availability of fruits and vegetables, and reducing their cost. The U.S. Department of Agriculture Economic Research Services estimates grocery retailers discard 8 percent 9 percent of fruits and vegetables they purchase for sale and consumers discard 19 percent of fruits and 22 percent of vegetables they buy. This represents 35.3 billion pounds of fruits and vegetables lost, valued at approximately \$49.8 billion. Some food loss is inevitable, but the potential savings from shortening the time from harvest to sale remain significant.³⁹

The triple bottom line

The “triple bottom line” perspective shows that a diet including a higher level of fruit and vegetables improves the health of people, the economy and the environment. This includes at least 39,900 avoided deaths, about 2.2 million fewer illnesses, 400 million tons of avoided greenhouse gas emissions and over \$7.6 billion per year in healthcare savings.

³⁹ Buzby, Jean. C., Wells, Hodan Farah, and Bentley, Jeanine, ERS’s Food Loss Data Help Inform the Food Waste Discussion, U.S. Department of Agriculture Economic Research Service, Amber Waves. <http://www.ers.usda.gov/amber-waves/2013-june/ers-food-loss-data-help-inform-the-food-waste-discussion.aspx#.VI2s6cZ-1MY>

**The Triple Bottom Line Benefit
(Environmental impact includes food waste)**



The Value of Coordinated Efforts

The American Heart Association’s initiative to engage with leaders representing the entire food chain – including sectors such as healthcare, environment, conservation, private investment, food and agriculture – represents the intentional alignment and coordination of efforts needed to realize true benefits of increasing fruit and vegetable consumption over the next decade.



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