



2015

GAP

Analysis

The Fruit and Vegetable
Consumption Challenge:
How Federal Spending Falls Short of
Addressing Public Health Needs

Allen Rosenfeld M+R Strategic Services

Allen Rosenfeld, an economist, is senior vice president in the strategic consulting division at M+R Strategic Services, a public affairs consulting firm based in Washington, D.C. He has more than twenty years' experience working on food and agriculture issues, including federal nutrition policy, food assistance programs, and agricultural subsidies in the past five farm bills. Allen received his Ph.D. from Cornell University.



Produce for Better Health Foundation

Produce for Better Health Foundation (PBH) is a non-profit 501 (c) (3) consumer education foundation whose mission is to motivate Americans to eat more fruit and vegetables to improve public health. PBH partners with government agencies like CDC, non-profit organizations, health professionals, educators, and members of the fruit and vegetable industry to promote increased consumption of fruit and vegetables. We leverage private industry and public sector resources, influence policy makers, motivate key consumer influencers, and promote fruit and vegetables directly to consumers.



Fruits & Veggies—More Matters

Managed by PBH, Fruits & Veggies—More Matters® is the nation's largest public-private fruit and vegetable nutrition education initiative. The foundation of Fruits & Veggies—More Matters is a brand logo and messaging designed to motivate Americans to eat more fruit and veggies. Fruits & Veggies—More Matters' materials are widely featured in print, on websites, and in social media channels like Facebook, Twitter, Pinterest, YouTube, and blogs. Since its inception in 2007, it is estimated that the Fruits & Veggies—More Matters logo has been seen an average of 214 times by every American.

Suggested Citation:

Rosenfeld, Allen. *2015 GAP Analysis—The Federal Fruit and Vegetable Consumption Challenge: How Federal Spending Falls Short of Addressing Public Health Needs, 2015*. Produce for Better Health Foundation, 2015. Web. <http://www.pbhfoundation.org/>

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Executive Summary

Introduction

This report is the third in the fruit and vegetable “Gap Analysis” series commissioned by Produce for Better Health Foundation. Like the previous two reports, it was designed to assess the extent to which federal policy makers, through their spending decisions, have made fruits and vegetables a national public-health priority. And, like its predecessors, this report found that despite rhetoric by high-level federal officials in support of greater fruit and vegetable consumption, federal spending remains out of synch with the federal government’s own food consumption recommendations and the risks of deadly, diet-related, chronic diseases associated with inadequate fruit and vegetable consumption.

The report has two primary goals: 1) to illuminate the national stake in greater fruit and vegetable consumption; and 2) quantify the extent to which spending by the U.S. Department of Agriculture (USDA) and the U.S. Department of Health and Human Services (HHS) reflects food consumption recommendations of the current *Dietary Guidelines for Americans, 2010* and the public health risks associated with inadequate consumption of fruits and vegetables. To accomplish those goals, the report provides new estimates of:

- The gap between actual and recommended fruit and vegetable consumption levels.
- The nationwide health risks and economic costs due to the consumption gap.
- The extent to which USDA spending related to fruits and vegetables reflects the importance of fruits and vegetables in the 2010 Dietary Guidelines.
- The degree to which USDA spending on nutrition education addresses the fruit and vegetable consumption gap.
- The extent to which spending by HHS agencies, the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC), reflects health risks attributable to inadequate consumption of fruits and vegetables.
- The size of the federal fruit and vegetable spending gap.

Main Findings

The Fruit and Vegetable Consumption Gap Is Large, Chronic and Growing: Dietary Guidelines’ Recommendations Continue to Greatly Exceed Per Capita Intake

To estimate the fruit and vegetable consumption gap, U.S. daily per capita consumption data for 2012 was estimated and compared with recommended daily intake levels in the Dietary Guidelines.

- The average U.S. resident consumed 37% of the recommended amount of fruits, and 57% of the recommended amount of vegetables, or only 46% of the recommended amount of fruits and vegetables combined.
- To close the fruit and vegetable consumption gap, the average American would have to increase consumption of fruit by 173% and vegetables by 77%, or 117% for fruits and vegetables combined.
- From 2000 to 2012, per capita fruit consumption decreased by 15%. Per capita vegetable intake declined by 9%. Between 2008 and 2012, per capita consumption of vegetables was stable, while per capita fruit consumption dropped by 9%.
- For the protein food group, which includes red meat, poultry, eggs, seafood, nuts and legumes, daily per capita consumption was 30% higher than the recommended intake level. Red meat and poultry accounted for 75% of that consumption.

The Public Health Risks Due to the Fruit and Vegetable Consumption Gap Are Substantial and Avoidable

The results of meta-analyses of scientific studies of the relationship between life-threatening chronic illnesses and consumption of fruits and vegetables indicated that increased consumption significantly reduces the risk of a number of those illnesses.

- Using that literature, this report estimated that closing the fruit and vegetable consumption gap would reduce the risk of cancer by 5.6%, coronary heart disease by 18.6%, and stroke by 22.2%.
- Those risk reductions would result in widespread enhancement of public health since combined, the three illnesses accounted for 43% of all U.S. deaths in 2012.



Economic Costs to the Nation Due to the Fruit and Vegetable Consumption Gap Are Very Large and Increasing

The fruit and vegetable consumption gap represents an urgent and growing challenge for the nation. The very large costs to the country were estimated in this report by adapting an approach used by a USDA economist in a 1999 report.

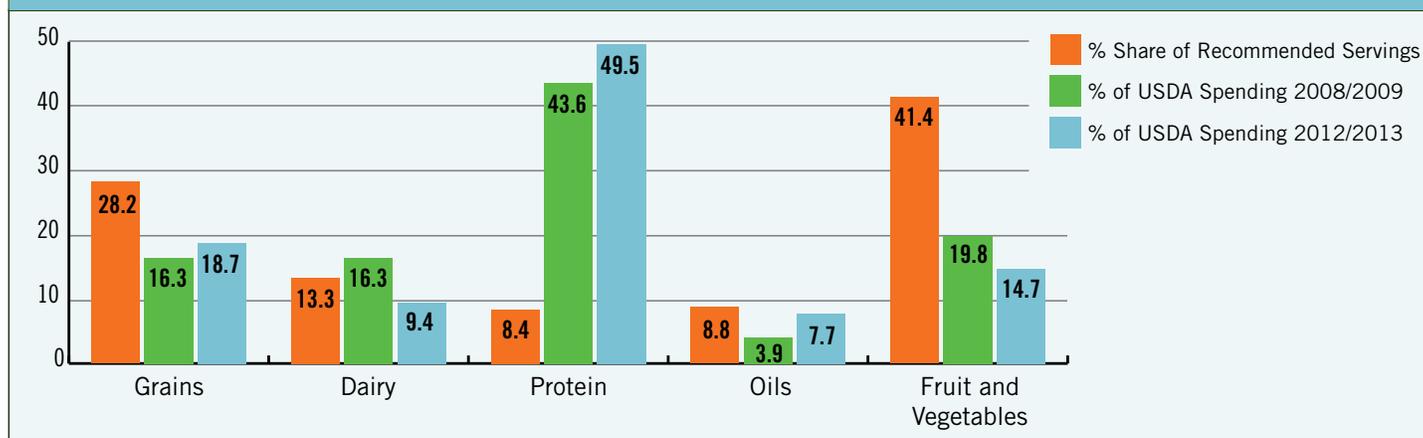
- The nationwide economic cost of the fruit and vegetable consumption gap for cancer, coronary heart disease, and stroke in 2012 (\$63.3 billion) was larger than the annual spending of 46 states and the GDP of 121 countries in 2012.
- While the annual economic costs of those three chronic diseases attributable to the fruit and vegetable consumption gap equaled 12% of the total cost of those diseases, the economic cost of stroke and coronary heart disease attributable to the consumption gap equaled 20% of the total cost of those two diseases.
- Between 2008 and 2012, the economic cost of the fruit and vegetable consumption gap for the three chronic illnesses increased by 12.6%. If it were assumed that the total increase occurred in equal amounts each year, the total cost to the nation, for the five years from 2008 through 2012 combined, would have been \$298.8 billion.

USDA Spending Contradicts the Priority of Fruits and Vegetables in the Dietary Guidelines: Lower-Priority Foods like Meat Receive the Bulk of USDA Support

The report produced estimates of average USDA spending for the FY 2012/2013 period related to domestic production and consumption of each of the major food groups in the Dietary Guidelines, including grains, dairy products, protein foods, oils, and fruits and vegetables. Types of spending included: production subsidy programs; promotion programs; research, education and extension; food purchases and consumption subsidies for nutrition assistance programs; and administrative and other program implementation expenses.

- Fruits and vegetables comprised more than 40% of total recommended servings for major food groups in the 2010 Dietary Guidelines. The protein group accounted for only 8% of total recommended servings or one-fifth of fruit and vegetable servings.
- USDA spending was inconsistent with public health recommendations. The share of total food group spending for fruits and vegetables was only 14.7%, or only about one-third of their share of recommended servings in a daily diet (41.4%).
- The protein food group dominated USDA spending, capturing 49.5% of all food-group spending though it accounts for only 8.4% of recommended daily servings. Its share of USDA spending was six times its share of recommended servings.
- Between the FY 2008/2009 and FY 2012/2013 periods, USDA fruit and vegetable spending as a percentage of its total food-group spending declined five percentage points while the protein group's share grew by six percentage points.
- USDA invested only about 1.8% of its annual budget on fruits and vegetables, an amount equal to only 4.3% of the U.S. economic cost of the consumption gap.

FOOD GROUPS:
DAILY RECOMMENDED SERVINGS VS. USDA SPENDING



USDA Spending for Nutrition Education Remains Far Short of Levels Needed to Encourage Substantial Increases in Fruit and Vegetable Consumption

Well funded, effective education programs can help close the consumption gap. From FY 2008 to FY 2013, for example, the Expanded Food and Nutrition Education Program (EFNEP) for low-income families led to average consumption increases equal to 55% of participants' consumption gap for fruits and 26% of the gap for vegetables. However, despite EFNEP's success, USDA's commitment to nutrition education remains weak.

- Annual spending per program participant varied greatly from program to program, from \$48.50 for the high-impact EFNEP to \$7.28 for SNAP, which reaches 47 million individuals, and \$.53 for the school meals programs, which reach 31 million youth.
- USDA spending on nutrition education did not reach most nutrition assistance program participants. For school meals programs and SNAP, spending averaged just 1% and 15% of EFNEP spending per participant, respectively.
- WIC, which spends nearly as much as EFNEP on nutrition education per participant, allocated about 6% of total program spending for nutrition education. SNAP allocated only 0.4% while school meals programs allocated 0.1%.



Fruits and Vegetables Are Also a Low Spending Priority for NIH and CDC Despite the Sizable Health Risks Attributable to the Consumption Gap

Analysis of multiple aspects of spending by the two agencies during the FY 2012/2013 period revealed that the scope of their fruit and vegetable related activities continues to be inconsistent with the health risks posed by the consumption gap.

- Only 1% of NIH research projects on cancer, coronary heart disease and stroke focused on fruits and vegetables, even though the fruit and vegetable consumption gap contributes between 5.6% and 22.2% of the risk for those three diseases.
- Despite these risks, only 2.5% of NIH spending on prevention projects was allocated to fruit and vegetable prevention projects.
- Both the share of NIH projects devoted to fruit and vegetables (5.4%) and share of NIH nutrition spending focused on fruits and vegetables (7.0%) are far below the 41.4% share of daily servings of fruits and vegetables in the 2010 Dietary Guidelines.
- There has been virtually no improvement in recent years. NIH findings in this report for the FY 2012/2013 period were virtually identical to findings for FY 2008 highlighted in the *2010 Gap Analysis* report.
- CDC also dramatically under spent on fruit and vegetable projects. Tobacco-prevention spending was 27 times fruit and vegetable spending even though tobacco's contribution to cancer, coronary heart disease and stroke risk was only 2.4 times the disease risk attributable to the fruit and vegetable consumption gap.



The Federal Fruit and Vegetable Spending Gaps Dwarf Actual Spending, but Equal Only a Small Percentage of USDA and HHS Budgets

The combined USDA, NIH and CDC Fruit and Vegetable Spending Gaps:

- For the FY 2012/2013 period, the total fruit and vegetable spending gaps were between 2.2 and 3.3 times as large as actual spending, depending on whether USDA were to add new food-group spending to close the gap or reallocate spending from other food groups to fruits and vegetables.
- Although the combined annual fruit and vegetable spending gap was very large (between \$6.8 billion and \$10.2 billion), that gap was equal to a very small portion (3.6% to 5.4%) of the total combined spending of USDA, NIH and CDC in the FY 2012/2013 period.

The USDA Fruit and Vegetable Spending Gap:

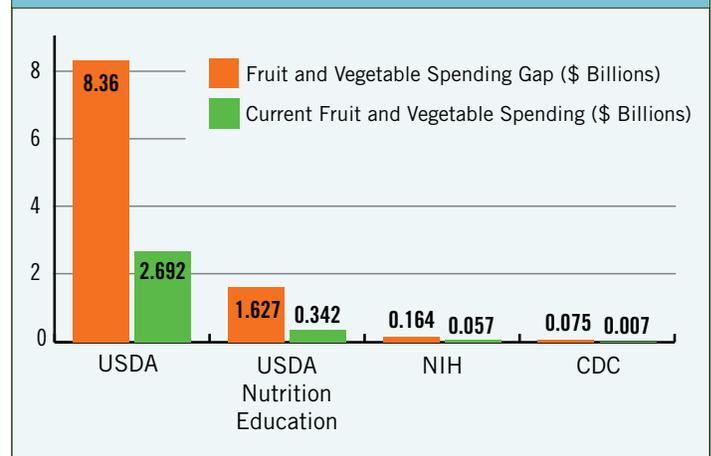
- Closing USDA's fruit and vegetable spending gap would require between \$4.9 billion and \$8.4 billion, depending on the source of the gap-closing funds. That's equal to between 1.8 and 3.1 times the actual annual fruit and vegetable spending of \$2.7 billion.
- The USDA fruit and vegetable spending gap was equal to only 3.3% to 5.7% of the average annual budget for the entire USDA during the FY 2012/2013 period.
- While USDA fruit and vegetable spending increases authorized in the 2014 Farm Bill are welcome steps in the right direction, their overall impact are too small to have much impact on USDA's fruit and vegetable spending gap. For example, non-crop-insurance spending increases for fruit and vegetables equal only about 4% of USDA's annual spending gap for the FY 2012/2013 period.

The USDA Nutrition Education Spending Gap:

- The added cost of bringing EFNEP-level nutrition education to all SNAP participants was estimated to be \$1.63 billion for the FY 2012/2013 period. Filling that spending gap would have required a nearly six-fold spending increase from \$342 million to \$1.97 billion.
- Closing the SNAP nutrition education spending gap would ensure a much greater public health return on the country's nutrition assistance program investment. That increase in spending would be equal to only 2.1% of the \$79.2 billion average annual cost of the SNAP program in the FY 2012/2013 period.

The new analyses of federal spending by USDA and HHS in this report consistently revealed that fruits and vegetables remain a low priority for federal policy makers when viewed in the light of public-health concerns and recommendations.

THE COST OF ALIGNING FEDERAL PROGRAMS WITH FEDERAL NUTRITION POLICY



The HHS (NIH and CDC) Fruit and Vegetable Spending Gap:

- The NIH fruit and vegetable spending gap (\$164 million), while much smaller than the USDA gaps, was 2.9 times as large as actual spending (\$57 million) by NIH on prevention projects for the three diseases that are related to the consumption of fruits and vegetables.
- Closing the NIH spending gap would require an additional expenditure equal to only 0.5% of the NIH budget.
- Using a risk perspective to place CDC's fruit and vegetable spending on par with the agency's tobacco prevention spending, produced an estimate of a \$75 million spending gap. That's 10.3 times CDC spending on fruits and vegetables for the FY 2012/2013 period.
- The CDC spending gap was equal to only 0.7% of average annual total CDC spending for the FY 2012/2013 period.

Conclusions

The new analyses of federal spending by USDA and HHS in this report consistently revealed that fruits and vegetables remain a low priority for federal policy makers when viewed in the light of public-health concerns and recommendations. The problem is pervasive as large spending gaps were identified across multiple federal agencies.

This low-priority status is not simply inconsistent with the supportive rhetoric of public officials regarding the need for Americans to increase fruit and vegetable consumption. It is also heavily at odds with a large, widening U.S. fruit and vegetable consumption gap, the importance of fruit and vegetable intake in federal dietary recommendations, and the heavy economic costs and public health risks attributable to the consumption gap.

Since the overall federal fruit and vegetable spending gap dwarfs recent federal outlays for fruits and vegetables, a substantial shift in priorities would likely be needed to reverse these spending patterns, especially for USDA, which accounts for the bulk of the federal fruit and vegetable spending gap. In fact, depending on the source of increased funds for fruits and vegetables, federal fruit and vegetable spending would have to more than triple or quadruple to close the combined spending gap. Closing that gap would require reallocation of spending among food groups, shifting spending away from non-food-group areas, and/or adding

new, targeted funding to federal agency budgets. Nonetheless, if Congress and Administration officials were willing to adopt more public-health oriented spending priorities, those gap-closing expenditures would be within reach since they represent only small percentages of recent USDA, NIH and CDC budgets.

Overview of Data Sources and Methods

Data for most of the analyses undertaken in this report were obtained from federal sources or secondary sources that provided federal data and estimates. Recommended levels of daily servings of each of the major food groups for the average American were derived from the meal patterns of the *Dietary Guidelines for Americans, 2010*. Per capita food consumption data were obtained from the “U.S. Per Capita Loss-Adjusted Food Availability” website of USDA’s Economic Research Service. Estimates of the contributions of the fruit and vegetable consumption gap and tobacco use to the risk of coronary heart disease, cancer, and stroke were obtained from academic research reports, nonprofit public health organizations’ websites, and federal sources.

The vast majority of USDA spending data for food group specific programs was drawn from federal budget documents, a Freedom of Information Act request response by USDA’s Farm Service Agency, and the websites of USDA’s Agricultural Marketing Service, Risk Management Agency, Food and Nutrition Service, and Current Research Information Service. NIH and CDC spending data were obtained from federal budget documents and the *NIH RePORTER* website. Inflation factors used throughout the report were computed from the Bureau of Labor Statistics’ *Consumer Price Index* website. To avoid skewed results due to single-year spending anomalies, all spending findings were reported as annual averages of federal government outlays during FY 2012 and FY 2013, the years of the most-recent federal data.

USDA spending data for commodity subsidies, research and program administration were analyzed to account for the fact that substantial portions of farm commodities were exported and converted to multiple domestic uses, such as food grain, feed grain, vegetable oil, sweeteners and biofuels. Only that portion of each food use that was consumed domestically was counted as USDA food-group spending since the focus of this report is domestic food consumption. In addition, calculated percentages of commodity subsidies, research spending and administrative costs associated with feed crops, such as feed grains and oilseeds, were counted as livestock product subsidies.



Introduction

This is the third fruit and vegetable ‘gap analysis’ in a series that began in the year 2000. Like its predecessors, this version has been designed to assess the extent to which the federal government, through its spending decisions, has made fruits and vegetables a national public-health priority. The 2010 report documented strong verbal support by federal officials for the important public-health role of fruits and vegetables. Despite that supportive rhetoric, the report also found that U.S. Department of Agriculture (USDA) spending was out of synch with the food consumption recommendations of the 2005 Dietary Guidelines for Americans and U.S. Department of Health and Human Services (HHS) spending was inconsistent with the risks of deadly, diet-based, chronic diseases.¹

The timing for this reprise of the 2010 report could not be more opportune. Fruits and vegetables are back in the news as the public and policy makers await the release by USDA and HHS of a new set of Dietary Guidelines. In February 2015, the 2015 U.S. Dietary Guidelines Advisory Committee of scientific experts released its recommendations to USDA and HHS. In that report, the Advisory Committee supported the meal patterns in the 2010 Dietary Guidelines² and recommended, once again, that Americans should increase substantially their consumption of fruits and vegetables. It is anticipated that the new guidelines will largely echo those recommendations.

There appears to be little question that the 2015 Guidelines will, once again, recommend that Americans increase their consumption of fruits and vegetables. What remains unclear, however, is whether the federal government has made progress in closing the gap between the Guidelines, public health risks, and public officials’ rhetoric, on the one hand, and federal spending priorities, on the other. To assess that progress, and determine what’s at stake for the nation, this report poses a set of sequential research questions, which include the following:

- How does actual consumption of fruits and vegetables in the U.S. compare with the levels recommended in the 2010 Dietary Guidelines, and to what extent have those consumption levels changed in recent years?
- What are the health consequences and economic costs to the nation associated with the gap between actual and recommended fruit and vegetable consumption levels?
- To what extent does recent USDA spending that promotes production and consumption of major food groups reflect recommendations in the 2010 Dietary Guidelines, especially regarding fruit and vegetable consumption?
- As part of its nutrition assistance programs, is USDA spending on nutrition education sufficient to have meaningful impacts on fruit and vegetable consumption?
- To what degree does recent HHS spending, including the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC), reflect the risks of serious chronic diseases associated with inadequate consumption of fruits and vegetables?
- How did spending on fruit and vegetable projects by federal agencies change between 2008, the year of data from the 2010 report, and 2013, the last year for which data were available for this report?
- What would it cost to close the fruit and vegetable spending gaps and bring federal spending in line with 2010 Dietary Guidelines’ food pattern recommendations and risks of chronic diseases associated with inadequate fruit and vegetable consumption?

This ‘gap analysis’ report relies primarily on federal government and academic sources to estimate the size of the fruit and vegetable consumption gap and its costs, and the size of the federal fruit and vegetable spending gap. It utilizes data about actual federal spending and federal projects to answer questions about federal priorities. The fruit and vegetable consumption gap was estimated through the use of USDA per capita food intake data. Costs of diet-related diseases were computed using previous government and university research studies about such costs and about the contribution of fruits and vegetables to the reduction of the risks of cancer, coronary heart disease and stroke.³

The landscape of the report creates a flow of findings that begins with an estimate of the new fruit and vegetable consumption gap. Following estimation of the consumption gap, the report determines the nation’s stake in closing the gap by combining the consumption gap estimate with previously derived economic costs of diet-related diseases.

The performance of the USDA agencies in helping to close the gap is then examined by assessing the extent to which their spending on program administration, commodity programs, crop insurance, consumption subsidies, and food purchases for nutrition assistance programs reflects the status of fruits and vegetables in the 2010 Dietary Guidelines. Similarly, HHS agency spending on fruit and vegetable projects is examined through the lens of the importance of fruit and vegetable consumption to risk reduction for major chronic diseases.

The report closes with spending estimates by USDA and HHS that would be required to close the fruit and vegetable spending gaps and bring federal spending in line with Dietary Guideline recommendations and the public health risks of major chronic illnesses.

The Persistent Fruit and Vegetable Consumption Gap

Estimating the Consumption Gap

The U.S. fruit and vegetable consumption gap was estimated by comparing actual per capita consumption of fruits and vegetables with the recommended consumption for the average American's caloric intake level in the 2010 Dietary Guidelines. If the per capita intake of fruits and vegetables falls short of the recommended levels for the average American, the difference between actual and recommended intake represents the nation's overall fruit and vegetable consumption gap.

As in the 2010 Gap Analysis, given the absence of recent comprehensive nationwide consumer survey data, the most recent USDA per capita data for fresh, canned, frozen and dried fruits and vegetables, including juices, were used.

The most recent year for which per capita food consumption data were available from USDA is 2012.⁴ The USDA food availability data used to estimate consumption has been well-correlated with the results of previous nationwide food intake surveys of U.S. consumers.⁵ The USDA Food Patterns in the 2010 Dietary Guidelines specify recommended consumption levels of fruits and vegetables for various levels of individuals' daily per capita caloric intake (e.g., 2,000 and 2200).⁶

Table 1 reports the findings of the comparison between the actual and recommended levels of fruit and vegetable consumption for 2012. The consumption gap in the table is expressed in

terms of both ounces and servings. Per capita food intake data was expressed in terms of ounces by USDA, while 2010 Dietary Guidelines' recommendations for daily fruit and vegetable consumption were defined in terms of cups. To enable the comparison of consumption recommendations across major food groups, Guidelines' recommendations, which were expressed in terms of ounces, cups and grams, were normalized by converting them to servings for purposes of this report.

From the data in **Table 1**, the following findings regarding the nation's fruit and vegetable consumption in 2012 can be extracted:

- The average U.S. resident consumed 37% of the recommended amount of fruits, and 57% of the recommended amount of vegetables. And, one ounce of the 6.6 ounces of vegetables consumed daily by the average U.S. resident (i.e., 6%) was comprised of frozen potatoes, such as French fries and hash browns that also contain vegetable oil, canned shoestring potatoes, and potato chips.
- Only 46% of the recommended amount of fruit and vegetables combined were consumed by the average U.S. resident.
- To close the fruit and vegetable consumption gap, the average American would have to increase consumption of fruit by 173% and vegetables by 77%.
- For fruits and vegetables combined, average consumption would have to increase by 117% to close the consumption gap.

TABLE 1.
THE U.S. FRUIT AND VEGETABLE CONSUMPTION GAP AS OF 2012

	Recommended for the Average American (oz.) ⁷	Actual Consumption Per Capita (oz.)	Gap between Recommended and Consumed (oz.)	Gap between Recommended and Consumed (½-cup servings)
FRUITS	13.1	4.8	8.2	2.5
VEGETABLES	11.7	6.6	5.1	2.3
FRUITS and VEGETABLES COMBINED	24.8	11.4	13.3	4.8

A comparison with the protein food group, which includes red meat, poultry, eggs, fish, shellfish, nuts and legumes, helps to place the fruit and vegetable consumption gap in perspective and set the stage for the analysis of USDA spending patterns in subsequent sections of this report. In contrast to fruits and vegetables, protein food group consumption was well above recommended levels. For that food group, in 2012, actual daily consumption was 30% higher than the levels recommended in the 2010 Dietary Guidelines. Red meat and poultry accounted for 75% of the total consumption of the protein food group. As the analysis of USDA spending patterns later in the report will show, this overconsumption is paralleled by the protein group's dominance of USDA spending.

Changes in Fruit and Vegetable Consumption in Recent Years

Despite the pivotal role played by fruits and vegetables in the Dietary Guidelines during the past two decades, USDA data reveal that little has changed regarding per capita fruit and vegetable consumption. As **Table 2** indicates, fruit and vegetable consumption for the average American has declined throughout the 2000s. Between 2000 and 2012, per capita fruit consumption decreased by 15% while vegetable consumption declined by 9%. Consumption of fruits and vegetables combined declined by 12% during this same time period. Although vegetable consumption stabilized between 2008 and 2012, fruit consumption continued to decline in that period.

It is no surprise, therefore, that the fruit and vegetable consumption gap did not close between 2008 and 2012. The 2010 Gap Analysis found that in order to reach recommended levels, fruit and vegetable consumption would have had to increase by 96%, compared to the 117% increase reported in **Table 1** of this report for 2012.

TABLE 2.
PER CAPITA FRUIT AND VEGETABLE
CONSUMPTION IN OUNCES, 2000 TO 2012

YEAR	2000	2004	2008	2012
FRUITS	5.7	5.6	5.3	4.8
VEGETABLES	7.2	7.2	6.6	6.6



Conclusion

The analysis of the fruit and vegetable consumption gap in this section reveals that the country continues to fall far short of dietary recommendations by the nation's public health experts despite decades of public concern and publicity about the connection between the incidence of chronic diseases and inadequate diets. For the average American, the fruit and vegetable consumption gap remains quite large with actual consumption, for fruits and vegetables combined, below half of the recommended level. And, comparison of data from previous years indicates that little or no progress has been made in closing that gap over time.

These findings, which mirror those from the 2010 report, should be reason enough for an examination and reassessment of federal policies. It is difficult not to conclude that existing efforts to elevate fruits and vegetables in the American diet have not been consistent with the size of the consumption gap. As the next sections demonstrate, these efforts have also failed to keep pace with the toll the consumption gap is taking on public health and the U.S. economy.

The Enormous, Growing Costs of the Consumption Gap

The Impact of Fruit and Vegetable Consumption on Diet-Related Diseases

The connection between diet and health, and more specifically between fruit and vegetable consumption and chronic diseases, has been well-established. A wide body of scientific literature exists supporting the conclusion that closing the fruit and vegetable consumption gap would significantly improve public health.⁸

To analyze the economic impact of the consumption gap, the risk of diet-related diseases associated with the gap were estimated first. Three chronic illnesses were selected for the analysis — cancer, coronary heart disease and stroke — for which there is a strong body of evidence supporting an inverse relationship between fruit and vegetable consumption levels and the incidence of those illnesses. The stakes associated with these three diseases, in terms of the health of Americans, are extremely high regardless of the size of the economic costs. The three diseases combined caused 1,082,637 deaths in 2012, or 43% of all deaths in the U.S. that year.

Empirical Studies on the Health Benefits of Fruit and Vegetable Consumption

A recent comprehensive review of the research on the impact of fruit and vegetable consumption on chronic diseases in the *European Journal of Nutrition* characterized the strength of the risk reduction capabilities for stroke and coronary heart disease as “convincing” and cancer as “probable”. These conclusions were drawn from multiple studies of large cohorts, such as The European Prospective Investigation into Cancer and Nutrition (a.k.a., the EPIC study)⁹ and a number of meta-analyses that combine the results of multiple statistical analyses.

Table 3 shows estimates of the extent to which closing the fruit and vegetable consumption gap would reduce the risk of those three diseases. These estimates are based on the size of the consumption gap and estimates, from the recent scientific literature, of the relationship between increased levels of fruit and vegetable consumption and reduction of disease risk.

“The overall body of evidence examined by the 2015 DGAC identifies that a healthy dietary pattern is higher in vegetables, fruits, whole grains, low- or non-fat dairy, seafood, legumes, and nuts; moderate in alcohol (among adults); lower in red and processed meat; and low in sugar-sweetened foods and drinks and refined grains. Vegetables and fruit are the only characteristics of the diet that were consistently identified in every conclusion statement across the health outcomes.”

-2015 Dietary Guidelines Advisory Committee (DGAC).
Scientific Report of the DGAC, Part A, Executive Summary. February, 2015.

TABLE 3.
RISK OF DIET-RELATED DISEASES DUE TO FRUIT AND VEGETABLE CONSUMPTION GAP

	% Of Total Risk Due to Fruit Vegetable Consumption Gap
CANCER	5.6
CORONARY HEART DISEASE	18.6
STROKE	22.2

Utilization of the disease risk associated with the gap follows the approach of an important 1999 study of the economic costs of diet-related chronic diseases in the U.S. by USDA economist, Elizabeth Frazao.¹⁰ To estimate the diet-related economic costs of cancer, coronary heart disease and stroke, Frazao multiplied the risk associated with diet for these diseases by the total economic cost of those diseases. In this report, the economic cost of the fruit and vegetable consumption gap was estimated as the percent of the total risk of the three diseases associated with the consumption gap times the total economic costs of the three chronic diseases. Economic costs, in the study, are defined as the sum of: direct medical costs; costs associated with loss of productivity (e.g., days lost from work); and estimates of the cost of premature loss of life (e.g., lost income due to a shorter life span).

For cancer, the results of the EPIC study were used to produce the risk estimates in **Table 3**. Risk estimates for coronary heart disease and stroke were derived as averages of results from the EPIC study and several meta-analyses.¹¹

Estimates of the total economic costs of the three chronic illnesses, which were taken directly from other sources and converted to 2012 dollars, are presented in **Table 4**.

The economic stakes, like the public health stakes, for these three diseases, are extremely high. For 2012 (the latest year for which data are available), the combined economic costs for the three diseases exceeded a half trillion dollars. That was larger than the Gross Domestic Product (GDP) of 167 countries that year.¹⁴

Table 5 outlines the estimated economic costs of the fruit and vegetable consumption gap for the three chronic illnesses for 2008 and 2012. Four key findings can be extracted from the data in the table:

- The combined U.S. economic cost of the fruit and vegetable consumption gap for all three diet-related diseases in 2012 (\$63.3 billion) was larger than the GDP of 121 countries that year. It also exceeded the annual expenditures of 46 states in the U.S. in 2012.¹⁵
- The combined annual economic costs to the nation of all three chronic diseases attributable to the fruit and vegetable consumption gap in 2012 (\$63.3 billion) was equal to 12% of the total cost of those diseases to the country.
- The annual economic cost of stroke and coronary heart disease attributable to the fruit and vegetable consumption gap in 2012 (\$47.5 billion) was equal to 20% of the total cost of those diseases to the country.
- Between 2008 and 2012, the economic cost of the fruit and vegetable consumption gap for the three chronic illnesses increased by 12.6%.
- If it were assumed that the 12.6% increase occurred in equal amounts each year, then the total cost to the nation would be \$298.8 billion from 2008 through 2012.

TABLE 4.
TOTAL COST OF THREE MAJOR DIET-RELATED DISEASES, 2008 AND 2012

	Total Economic Costs, 2008 ¹²	Estimated Total Economic Costs, 2012 ¹³
\$ Billions		
CANCER	228.1	281.7
CORONARY HEART DISEASE	177.1	159.2
STROKE	73.7	80.6
TOTAL	478.9	521.5

TABLE 5.
TOTAL COST OF FRUIT AND VEGETABLE GAP FOR DIET-RELATED DISEASES, 2008 AND 2012

	Estimated Total Economic Costs, 2008	Estimated Total Economic Costs, 2012
\$ Billions		
CANCER	13.7	15.8
CORONARY HEART DISEASE	28.3	29.6
STROKE	14.2	17.9
TOTAL	56.2	63.3

Conclusion

This section has shown that the fruit and vegetable consumption gap represents an urgent challenge for the nation. The costs to the country, in the form of unnecessary increases in the incidence of deadly chronic diseases and tens of billions of dollars in annual economic costs, are extremely large and growing. And, the persistence of the gap, despite lip-service by public officials to the need to increase fruit and vegetable consumption, begs the question of whether the federal government has been doing enough to address this critical, nationwide public-health challenge. The next section of the report examines the federal response to the challenge through the lens of USDA's spending on programs that encourage the production and consumption of fruits and vegetables.

USDA Spending is Still Inconsistent with National Public Health Goals

Introduction

As mentioned in the introductory section of this report, USDA and HHS have joint responsibility for managing the federal government's responses to the challenges raised by the costly, deadly relationship between inadequate diets and major chronic diseases. By and large, as documented in the 2010 Gap Analysis, public officials from both departments have been verbally supportive of the need to close the fruit and vegetable consumption gap.

“Helping families purchase more fresh produce is clearly good for families’ health, helps contribute to lower health costs for the country, and increases local food sales for family farmers.”

- USDA Secretary, Tom Vilsack. “USDA Announces up to \$31 Million to Empower People to Make Healthy Eating Choices,” Press Release. September 29, 2014.

A recent quote from USDA Secretary, Tom Vilsack, indicates that USDA officials are still verbally recognizing the importance to the nation of increasing fruit and vegetable consumption.¹⁶ This section of the report, however, moves beyond the rhetoric of federal officials to assess recent real-world actions by USDA that have affected the production and consumption of fruits and vegetables.

The underlying assumption of this analysis is that an examination of USDA's spending patterns will offer a robust indicator of the degree to which USDA officials' rhetoric about diet and health has been translated into action. USDA spending provides one of the major mechanisms through which the priorities of that department and relevant agencies are expressed. USDA spent an average of \$148 billion during the 2012 and 2013 fiscal years.



Methodology Used to Calculate Food-Group Spending

The analysis in this section is designed to determine the extent to which the allocation of USDA spending among the five major food groups coincides with the nation's diet and health priorities as expressed in the food pattern recommendations of the 2010 Dietary Guidelines. In addition to the fruits and vegetables,¹⁷ the major food groups included food grains, protein (or meat) category (e.g., beef, pork, poultry, fish, legumes, and nut products), dairy products, and oils.

In the analysis, the 2010 Dietary Guidelines' allocation of recommended daily food servings among the major food groups was used as a proxy for the nation's diet-and-health priorities. It was assumed that a close match between the allocation of USDA resources among food groups, on the one hand, and the distribution of recommended food group servings, on the other, indicated that federal priorities were synchronized with the diet and health mandate reflected in the Guidelines. The converse would also be true. For example, suppose that a specific food group accounted for a large proportion of the total recommended daily servings, but consumption of that food group fell far short of recommended levels. Federal spending associated with that food group would be expected to account for a relatively high percentage of total spending for all the food groups if closing the consumption gap was a major federal priority.

It is important to note that although this section of the report focuses on USDA spending, a great deal of the responsibility for the allocation of USDA's resources is the result of policy and spending decisions made by Congress in its multi-year farm bills and annual appropriations bills. For example, while income-subsidy, crop-insurance, and commodity oriented promotion programs are administered by USDA, program spending parameters are dictated largely by policies enacted by Congress.

Four types of USDA spending that support the production and consumption of the major food groups were included in the analysis:

- Production subsidy programs and commodity oriented promotion programs;
- Commodity specific food and agricultural research, education and extension;
- Food-group-specific purchases or subsidies by the Agricultural Marketing Service (AMS), Farm Service Agency (FSA), and Food and Nutrition Service (FNS) for nutrition assistance programs, such as food purchasing vouchers for participants in the Special Supplemental Nutrition Program for Women, Infants and Children i.e., WIC; and
- Administrative and other implementation expenses for commodity specific programs, such as the AMS' dairy program.



The time period of the data used in the analysis covers federal fiscal years 2012 and 2013. All findings reported in the tables in the rest of this section represent average annual values for the two fiscal years. Two years were selected for the analysis of spending to smooth and avoid the bias from any exceptional spending that might be incurred in a single year such as happened in FY 2012 when crop insurance payments for grains and oilseeds surged. Also, FY 2013 was the most-recent year for which spending data used in the analysis were available from federal government and other sources.

Spending data for commodity-program subsidies, research and program administration were adjusted to account for the fact that substantial portions of food group commodities were removed from domestic consumption via export markets and were also converted to multiple domestic uses. Corn subsidies, for example, were allocated to corn's multiple uses, based largely on USDA supply and disappearance data, including food grain, feed grain, vegetable oil, sweetener and ethanol. Only that portion of each food use that was consumed domestically was counted as USDA food-group spending since the focus of this report is domestic food consumption. In addition, the proportion of corn subsidies assigned to domestic feed grain use was counted as spending that subsidized production in the protein food group. Similar computations were performed to allocate spending for research and for administration of programs that benefit specific food groups from grain and oilseed crops to the protein food group.

The Place of Each Food Group in the 2010 Dietary Guidelines

Table 6 reveals the estimated daily number of servings recommended in the 2010 Dietary Guidelines for each of the major food groups. As with fruits and vegetables in **Table 1**, portion sizes recommended in the 2010 Guidelines' USDA Food Pattern in terms of ounces, cups and grams were converted to servings for a person with the average daily caloric intake to normalize the data across all food groups.¹⁸ As in the 2010 Gap Analysis, the number of recommended servings for each of the food groups was then converted into the percentage share of the total number of daily servings for the five major food groups combined as shown in **Table 7**.

Fruits and vegetables are the dominant food group in terms of 2010 Dietary Guidelines consumption frequency, comprising more than 40% of total recommended servings as indicated in **Table 7**. Food grains represent a close second with the protein food group accounting for only 20% of the number of recommended servings of fruits and vegetables. In accordance with the approach used in this section, USDA spending for fruits and vegetables would be five times the level of its spending for the protein food group if the Department were driven primarily by public health.

USDA Commodity Program and Consumer Subsidies

Commodity subsidies that encourage crop production place downward pressure on farm commodity prices and stimulate a higher level of consumption than would otherwise occur, all other things equal. For this section of the spending analysis, a range

of traditional commodity program production subsidies were included, such as direct payments to farmers, as well as federal crop insurance expenditures, which have played an increasingly large role in subsidizing farmer incomes since the 2008 Farm Bill. USDA, through its commodity programs, subsidizes the production of food and feed grains (such as corn, sorghum, barley, wheat and rice), oilseeds (such as soybeans, canola and sunflower seeds), milk, and peanuts. Federally subsidized crop insurance covers a multitude of crops. Other programs covered by the federal farm bill that promote specific industries, such as farmers' market promotion, the Fresh Fruit and Vegetable Program, and the Specialty Crops Block Grant program, were also included.²⁰

Table 8 reports the annual average USDA spending per food group for the FY 2012/2013 period. As the table shows, the amount of spending on the protein food group and the fruit and vegetable group are the reverse of the rankings of the groups with

TABLE 7.
SHARE OF SERVINGS RECOMMENDED FOR MAJOR FOOD GROUPS

	Percent of Total Recommended Servings
GRAINS	28.2%
DAIRY	13.3%
PROTEIN FOOD GROUP	8.4%
OILS	8.8%
FRUITS AND VEGETABLES	41.4%

TABLE 6.
RECOMMENDED NUMBER OF FOOD GROUP SERVINGS FOR VARIOUS DAILY CALORIC INTAKES

FOOD GROUP	2,000 Calories	2,073 Calories ¹⁹	2,200 Calories
GRAINS	6.0	6.37	7.0
DAIRY	3.0	3.00	3.0
PROTEIN FOOD GROUP	1.8	1.89	2.0
OILS	1.9	1.98	2.1
FRUITS	4.0	4.00	4.0
VEGETABLES	5.0	5.37	6.0

TABLE 8.
USDA SPENDING ON FOOD GROUP COMMODITY SUBSIDIES, FY 2012/FY 2013

	Spending (\$ Millions)	% of Total Spending
GRAINS	1.976	22.5%
DAIRY	0.647	7.3%
PROTEIN FOOD GROUP	4.641	52.7%
OILS	1.122	12.7%
FRUITS AND VEGETABLES	0.415	4.7%
ALL FOOD GROUPS	8.801	100%

respect to their roles in the daily diets recommended in the 2010 Dietary Guidelines. For spending, the protein food group moved to the very top, far exceeding the percentage share of other food groups, while fruits and vegetables had the lowest percentage share.

The following findings can be derived from [Table 7](#) and [Table 8](#).

- Although fruits and vegetables represent more than 40% of recommended daily food servings, their federal commodity subsidies comprised \$415 million, or a mere 4.7% of the \$8.8 billion in annual commodity subsidies for all food groups combined ([Figure 1](#)).
- Despite comprising only 8% of recommended daily servings, the protein food group accounted for \$4.6 billion, or more than half, of federal commodity subsidies ([Figure 1](#)).
- Ninety-eight percent of the commodity subsidy total for the protein food group is the result of grain and oilseed subsidies.

USDA Spending on Research, Education, and Extension

Food-group spending on research, education and extension activities by USDA and satellite institutions, such as the state agricultural experiment stations, were analyzed. This spending category is the smallest of the four examined in this analysis. Nonetheless, its impact is significant since public sector research and related spending to assist food and agricultural production has a significant impact on productivity, which in turn can have a significant impact on the price and consumption of those products.

Data were obtained for FY 2012 and FY 2013 from USDA's Current Research Information System (CRIS). The national summaries provided through CRIS produce spending by type of crop and livestock, and by specializations that support livestock production, such as rangeland management.²¹

[Table 9](#) reveals the amounts and shares of total spending captured by each food group. The share of spending for fruits and vegetables (26.6%) was more in line with the fruit and vegetable food group's share of 2010 Dietary Guidelines' recommended daily servings (41.4%) than was its share of commodity subsidies. Nonetheless, its share of spending still fell significantly short of the 2010 Dietary Guidelines' benchmark. As shown in [Figure 2](#), despite comprising only 8% of 2010 Dietary Guidelines' recommended daily servings, the protein food group captured more than half (51.2%) of USDA food-group spending in this category.

TABLE 9.
USDA SPENDING ON FOOD AND AGRICULTURAL RESEARCH, EDUCATION AND EXTENSION, FY 2012/2013

	Spending (\$ Millions)	% of Total Spending
GRAINS	143.1	9.5%
DAIRY	124.3	8.2%
PROTEIN FOOD GROUP	771.6	51.2%
OILS	66.4	4.4%
FRUITS AND VEGETABLES	401.6	26.6%
ALL FOOD GROUPS	1,507.1	100%

FIGURE 1.
DAILY RECOMMENDED SERVINGS VS. USDA SUBSIDY SPENDING BY FOOD GROUP, FY 2012/2013

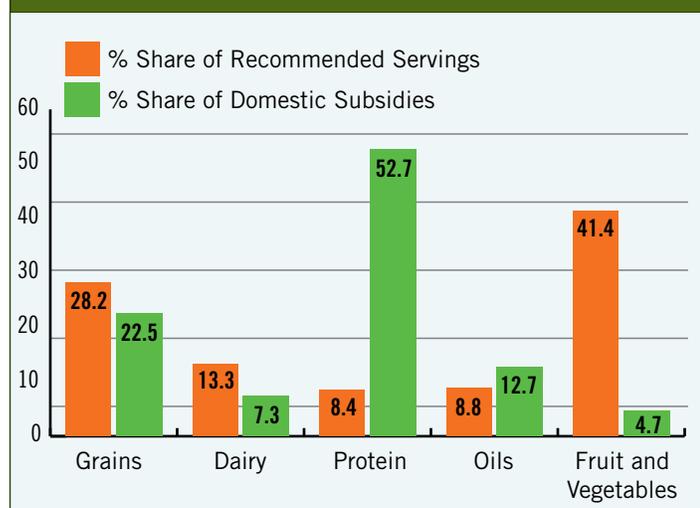
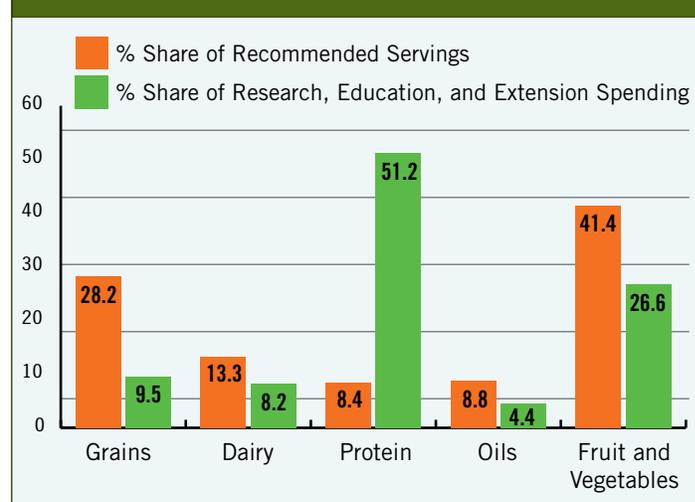


FIGURE 2.
DAILY RECOMMENDED SERVINGS VS. USDA RESEARCH, EDUCATION, & EXTENSION SPENDING, FY 2012/2013



USDA Spending on Nutrition Assistance Programs

USDA food-group spending on the federal domestic feeding programs, which serve tens of millions of low-income families, is reported in **Table 10**. Although this is the second-largest spending category examined in this study, food-group-specific expenditures represent only a small percentage of the annual total cost of the federal nutrition assistance programs.²²

Food-group spending for the nutrition assistance programs includes direct purchases of food by USDA agencies and consumer subsidies for program participants, which lead directly to greater consumption of food products than would have occurred in their absence. Specifically, AMS²³ and FSA²⁴ food purchases for programs such as the National School Lunch Program, the National School Breakfast Program, and the commodity distribution programs, in addition to consumer subsidies provided through the WIC program, were examined.

As **Table 10** indicates, the proportion of total food-group nutrition-assistance spending allocated to fruits and vegetables is on par with that food group's share of research although it falls significantly short of the share of recommended servings in the 2010 Dietary Guidelines. Once again, as shown in **Figure 3**, the protein food group's share of total food-groups spending for nutrition assistance programs (39.9%) far exceeded its share of daily recommended servings (8.4%).

Spending for the WIC program accounted for 68% of total spending (\$1.16 billion) of the \$1.7 billion of nutrition assistance program spending on fruits and vegetables. To compute WIC spending, the same approach was used as in the 2010 Gap Analysis Report report. The estimates were derived from USDA's

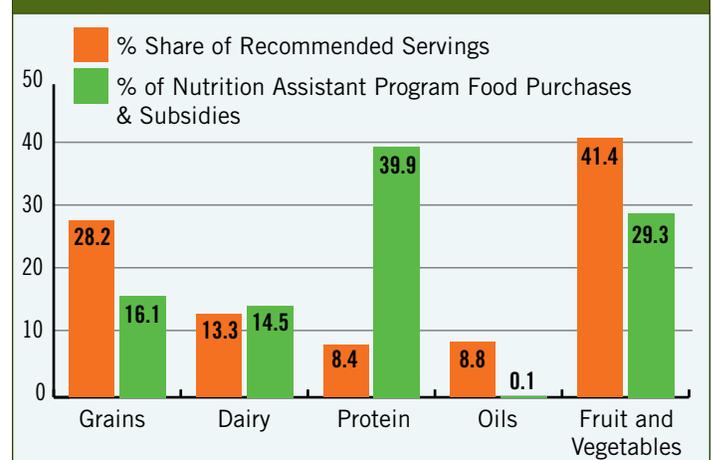
estimates of WIC participants' prescribed spending for specific food products (e.g., juice, milk, cheese, bread, peanut butter) and the value of vouchers for fruit and vegetable purchases in documents accompanying USDA's rule for revisions of WIC food packages. Those 2009 cost estimates were adjusted for inflation, based on Consumer Price Index data for relevant food products, and participant levels between then and the FY 2012/2013 period.²⁵



TABLE 10.
USDA FOOD PURCHASES AND CONSUMER SUBSIDIES, NUTRITION ASSISTANCE PROGRAMS, FY 2012/2013

	Total Purchases (\$ Billions)	% of Total Purchases
GRAIN	0.934	16.1%
DAIRY	0.838	14.5%
PROTEIN FOOD GROUP	2.312	39.9%
OIL	0.008	0.1%
FRUITS AND VEGETABLES	1.697	29.3%
ALL FOOD GROUPS	5.789	100%

FIGURE 3.
DAILY RECOMMENDED SERVINGS VS. USDA NUTRITION ASSISTANCE PROGRAM FOOD PURCHASES & SUBSIDIES, FY 2012/2013



USDA Spending to Administer Food-Group-Specific Programs

USDA spending on the administration of programs designed to benefit specific food groups is reported in **Table 11**. Those programs include: management of the crop insurance program by the Risk Management Agency (RMA); management of the income support programs by FSA; livestock grazing management programs;²⁶ the grain and livestock inspection programs of the Grains, Packers and Stockyards Administration; commodity

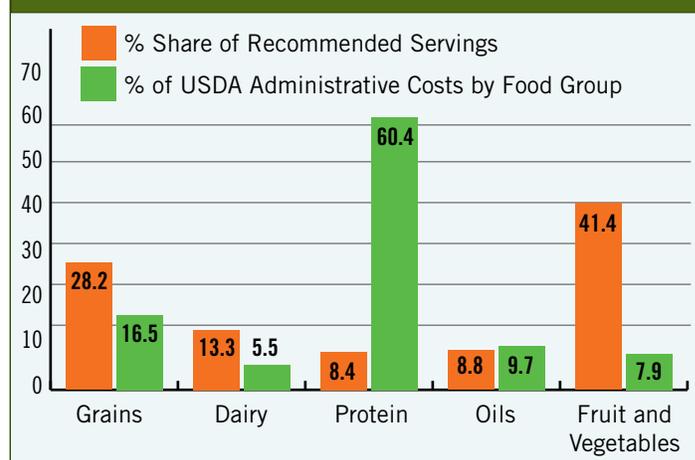
specific programs of the Animal and Plant Health Inspection Service (APHIS); and AMS' dairy, meat and poultry, and fruit and vegetable programs.²⁷

As **Table 11** illustrates, relatively little spending (less than 8% of spending for all food groups) was allocated to fruits and vegetables for the management and execution of programs designated to support specific commodities and food groups. Once again, the protein food group dominated spending, accounting for 60% of total spending for those types of programs, despite comprising only 8% of recommended daily servings (**Figure 4**.)

TABLE 11.
USDA ADMIN. COSTS FOR PROGRAMS BENEFITTING SPECIFIC FOOD GROUPS, FY 2012/2013

	Program Spending (\$ Millions)	% of Total Spending
GRAIN	369.8	16.5%
DAIRY	123.0	5.5%
PROTEIN FOOD GROUP	1,352.0	60.4%
OILS	216.5	9.7%
FRUITS AND VEGETABLES	177.9	7.9%
ALL FOOD GROUPS	2,239.2	100%

FIGURE 4.
DAILY RECOMMENDED SERVINGS VS. USDA SPENDING TO ADMINISTER FOOD GROUP SPECIFIC PROGRAMS, FY 2012/2013



Summarizing the Gaps in USDA's Spending on Fruit and Vegetables

Tables 12 and 13 provide two composite views of the data in Tables 8 through 11. Table 12 provides a summary from the perspective of the four program areas, while Table 13 combines the data from a food-group vantage point.

Key findings from the two tables include:

- For all four program areas combined, USDA spending on fruits and vegetables equaled \$2.69 billion, or only about 1.8% of USDA's total budget and 4.3% of the economic cost of the fruit and vegetable consumption gap.
- That spending level, as a percentage of total food-group spending by USDA, is inconsistent with the importance of fruits and vegetables in the 2010 Dietary Guidelines. Overall, the share of total spending for fruits and vegetables (14.7%) was only about one-third of the share of servings in the daily diet recommended by the 2010 Dietary Guidelines (41.4%).
- By contrast, the protein food group dominated USDA spending despite comprising only a small percentage of total daily recommended servings. The protein food group captured half (49.5%) of all food-group spending in the FY 2012/2013 period even though it represents only 8.4% of recommended daily servings. In other words, its share of USDA spending was almost six (5.9) times its share of recommended daily food servings. As a result, the spending shares of dominant foods in the 2010 Dietary Guidelines, fruits, vegetables and grains, fell far below their shares of recommended daily food servings.



TABLE 13.
USDA SPENDING FOR ALL 4 PROGRAM AREAS, BY FOOD GROUP, FY 2012/2013

	% Share of Recommended Daily Servings	% Share of FY 2008/2009 Spending	% Share of FY 2012/2013 Spending ²⁸
GRAINS	28.2%	16.3%	18.7%
DAIRY	13.3%	16.3%	9.4%
PROTEIN FOOD GROUP	8.4%	43.6%	49.5%
OILS	8.8%	3.9%	7.7%
FRUITS AND VEGETABLES	41.4%	19.8%	14.7%

TABLE 12.
USDA FRUIT AND VEGETABLE SPENDING, BY PROGRAM AREAS, FY 2012/2013

	Fruits and Vegetables (\$ Billions)	All Food Groups Combined (\$ Billions)	Fruit and Vegetable Spending as a % of Total Food Group Spending
COMMODITY SUBSIDIES	0.415	8.801	4.7%
RESEARCH, EDUCATION AND EXTENSION	0.402	1.507	26.6%
PROGRAM ADMINISTRATION	0.178	2.239	7.9%
NUTRITION ASSISTANCE PROGRAMS	1.697	5.789	29.3%
ALL 4 PROGRAM AREAS	2.692	18.336	14.7%

A comparison of the results for this report and the 2010 Gap Analysis report is also cause for concern from a public health standpoint. As seen in **Figure 5**, the results of the two studies indicate that USDA has not elevated fruits and vegetables as a spending priority since 2008. USDA fruit and vegetable spending, as a percentage of its total food-group spending, declined between the FY 2008/2009 period (19.8%) and the FY 2012/2013 period (14.7%). In addition, the share of spending captured by the protein food group grew by six percentage points between the FY 2008/2009 and FY 2012/2013 periods.

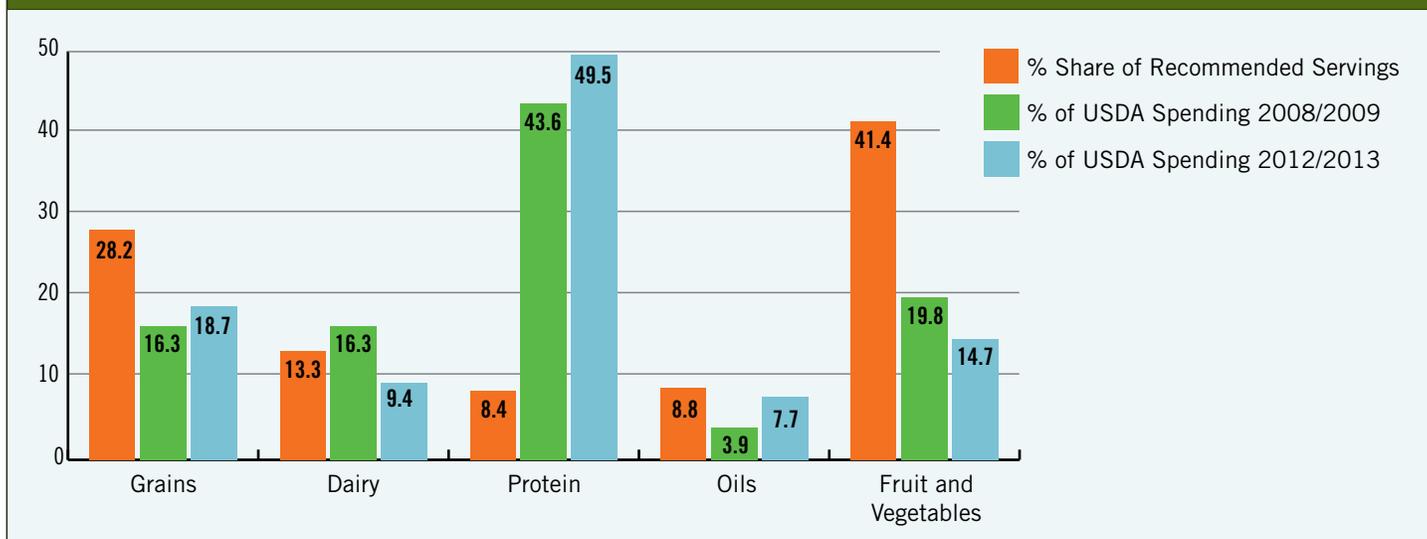
The declining share and dollar amounts²⁹ of fruit and vegetable spending by USDA between the FY 2008/2009 and FY 2012/2013 periods appears to be largely the results of food price movements and changes in crop insurance spending. During the years between those two periods, the prices of meat products purchased and subsidized for the nutrition assistance programs rose substantially relative to the prices of fruits and vegetables. Also, the federal government’s crop insurance costs for grains and oilseeds surged in 2012.

Conclusion

The results of the analysis of recent USDA food-group spending are sobering from a public-health perspective. They demonstrate that fruits and vegetables continue to be a very low priority for USDA and Congress, relative to spending for other food groups, despite the fruit-and-vegetable-friendly rhetoric of USDA officials and the recommendations in the 2010 Dietary Guidelines issued by USDA in partnership with HHS. As a later section of this report will show, closing the fruit and vegetable spending gap will require a substantial shift in de facto priorities for the Department.



FIGURE 5.
DAILY RECOMMENDED SERVINGS VS. ALL USDA SPENDING OVER TIME



The Federal Government's Nutrition Education Spending Gap

Another indicator of the federal government's commitment to the 2010 Dietary Guidelines' recommendations and the need to close the fruit and vegetable consumption gap is the Department's spending on nutrition education.

USDA's nutrition education programs are targeted to low-income Americans who participate in federal nutrition assistance programs. These programs include:

- EFNEP, the Expanded Food and Nutrition Education Program;
- FDPIR Nutrition Aides, the nutrition education program for the Food Distribution Program for Indian Reservations;
- SNAP-Ed, the nutrition education arm of the Supplemental Nutrition Assistance Program, formerly known as the Food Stamp Program;
- Team Nutrition, which is responsible for nutrition education efforts accompanying the school meals programs; and
- The WIC Nutrition Ed program, which provides nutrition education to women in the Special Supplemental Program for Women, Infants and Children.

In addition, HHS, through the Centers for Disease Control and Prevention's (CDC) Division of Nutrition, Physical Activity and Obesity (DNPAO) program, also administers initiatives that support state-level public outreach programs and provides non-monetary support for the Fruits & Veggies—More Matters® program, which used to be known as “5 A Day”.

Investment in Nutrition Education Remains a Low Level Priority

Nutrition assistance programs reach tens of millions of Americans each year that could benefit substantially from well-funded, effective nutrition education programming. As **Table 14** indicates, however, nutrition education spending represented less than one percent of total spending for nutrition assistance programs during the FY 2012/2013 period.

Given the size of the fruit and vegetable consumption gap and the number of families reached by the nutrition assistance programs, the findings reported in **Tables 14 and 15** suggest an area of substantial under-spending with great potential to enhance fruit and vegetable consumption.

Results of tracking studies of consumption by nutrition education participants indicate that investing in nutrition education can have a large payoff in terms of shrinking the fruit and vegetable consumption gap. During the FY 2008 to FY 2013 period, EFNEP resulted in an average increase in fruit and vegetable consumption of 0.8 of a cup per day per participant. The consumption increases were equal to 55% of EFNEP participants' consumption gap for fruits and 26% of the gap for vegetables. In addition, a recent study of the California WIC program indicates that more focused fruit and vegetable-oriented interventions

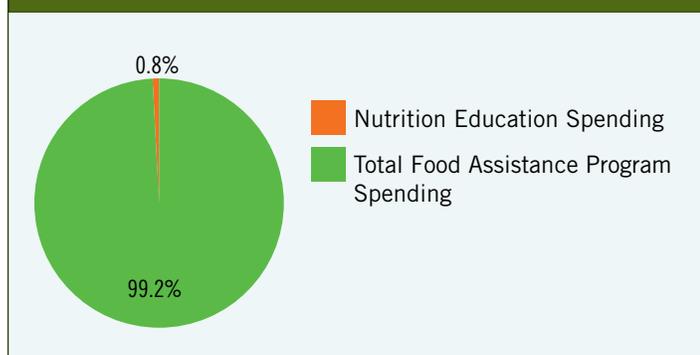
TABLE 14.
NUTRITION EDUCATION'S SHARE OF NUTRITION ASSISTANCE PROGRAM SPENDING, FY 2012/2013

USDA Program	Nutrition Education Spending (\$ Millions)	Total Food Assistance Program Spending (\$ Billions)	Nutrition Education as a % of Nutrition Assistance Spending
EFNEP ³⁰	65.3	Not Applicable	Not Applicable
FDPIR	1.0	0.101	1.0%
SNAP	342.5	79.170	0.4%
TEAM NUTRITION (SCHOOL MEALS)	16.5	15.306	0.1%
WIC	405.8	6.639	6.1%
TOTAL	831.1	101.216	0.8%

TABLE 15.
FEDERAL SPENDING ON NUTRITION EDUCATION PROGRAMS, FY 2012/2013

Federal Program	Spending (\$ Millions)	Participants	Dollars Per Participant
CDC - NPAO	20.2	Not Applicable	Not Applicable
EFNEP ³³	65.3	544,014	47.93
FDPIR	1.0	76,050	13.14
SNAP	342.5	47,122,545	7.28
TEAM NUTRITION	16.5	31,200,000	0.53
WIC	405.8	8,785,500	46.20
TOTAL	851.3		

FIGURE 6.
NUTRITION EDUCATION'S SHARE OF NUTRITION ASSISTANCE PROGRAM SPENDING, FY 2012/2013



with WIC participants, designed to leverage the new regulations that provide WIC vouchers to purchase fruits and vegetables, are having a greater impact than previous multi-component interventions.³¹

To its credit, USDA increased spending on nutrition education for the nutrition assistance programs by 21% from \$687 million in FY 2008 to an annual average of \$831 million for the FY 2012/2013 period. As [Table 15](#) indicates, however, the average spending on nutrition education per participant in the SNAP and school meals' programs, which are the country's two largest nutrition assistance programs, lags far behind the EFNEP benchmark.

Nonetheless, recent impact analyses commissioned by USDA of a number of local SNAP-ED projects demonstrate that money alone will not close the nutrition education gap. Only two of the seven programs evaluated resulted in robust increases in fruit and vegetable consumption by the participants. The highest increase

identified was 0.52 cups, well below the average EFNEP increase during the FY 2008-to-FY 2013 period reported above.³² Moreover, the costs per participant for the two SNAP-Ed programs with robust impacts were both more than double the cost per participant for EFNEP. For these reasons, the EFNEP approach was used as a standard of comparison for assessing the federal nutrition education spending gap that is outlined later in this report ([Table 23](#), page 28).

[Tables 14 and 15](#) provide additional evidence of a large USDA nutrition-education spending gap:

- During the FY 2012/2013 period, average spending per participant varied tremendously from program to program, from \$47.93 for the high-impact EFNEP to \$7.28 for SNAP, which reaches 47 million individuals, and \$.53 for the school meals programs, which reach 31 million youth.
- Nutrition education spending for school meals participants was just 1% of the spending per participant by EFNEP. For each SNAP program beneficiary, it was only 15% of EFNEP spending.
- WIC, which spends nearly as much as EFNEP on nutrition education per participant, allocated about 6% of total program spending for nutrition education. SNAP and the school meals programs, on the other hand, allocated only 0.4% and 0.1% respectively to nutrition education.
- Taken together, all the nutrition assistance programs that provide nutrition education, allocated less than 1% of their combined budgets to nutrition education ([Figure 6](#)). The small nutrition education expenditures per participant in SNAP and school meals programs, which comprised 93% of total nutrition assistance program spending, were largely responsible for the limited overall performance.

Conclusion

From the findings of the analysis in this section, there is an enormous amount of room for expansion of USDA spending on nutrition education within the nutrition-assistance programs. Despite the size and cost of the fruit and vegetable consumption gap, recent USDA spending on nutrition education failed to reach most nutrition assistance program participants. There is consistent evidence from the EFNEP program tracking reports that well-funded, effective nutrition education programs can help close the fruit and vegetable consumption gap. Given the enormous investment by the federal government in enhancing food access for low-income families, it makes sense to also invest in effective nutrition education programs to ensure a greater public-health bang for the nutrition-assistance buck.

NIH Spending Fails to Reflect Health Risks and Recommendations

Like USDA, HHS has a critical role to play in addressing the relationship between diet and health. Two HHS agencies, the CDC and the NIH, are at the heart of the federal government's public-health research and disease-prevention complex. Their project mixes and spending patterns offer two additional lenses through which to view federal priorities regarding the nation's fruit and vegetable consumption gap. This section relies on data from the *NIH RePORTER*,³⁴ the NIH's online database of the medical research it conducts and funds, and federal budget materials³⁵ to estimate the extent to which HHS spending on fruit and vegetable-related projects reflects the 2010 Dietary Guidelines and the health risks associated with low fruit and vegetable consumption.

Table 16 and Table 17 document the number of, and spending on, NIH fruit and vegetable research projects. The data reported in both tables indicate that, for three major chronic diseases, the scope of NIH fruit and vegetable research was not consistent with the contribution that inadequate fruit and vegetable consumption plays in the risks for those diseases. For the three diet-related diseases combined, only one percent of those projects were related to fruits and vegetables, despite the fact that the fruit and vegetable consumption gap contributes between 5.6% and 22.2% of the risk for those diseases (see also **Figure 7**). Spending on fruit and vegetable projects accounted for less than one percent of NIH spending.

TABLE 16.
NIH SPENDING ON FRUIT AND VEGETABLE PROJECTS FOR 3 DIET-RELATED DISEASES, FY 2012/2013

	All Research Projects (\$)	Fruit and Vegetable Research Projects (\$)	Fruit and Vegetable Spending as a % of Total Spending	% of Disease Risk Due to Fruit and Vegetable Consumption Gap ³⁶
CANCER	5,504,327,732	51,021,016	0.9%	5.6%
CORONARY HEART DISEASE	436,293,537	3,182,621	0.7%	18.6%
STROKE	299,616,711	2,710,395	0.9%	22.2%
ALL 3 DISEASES	6,240,237,980	56,914,031	0.9%	

TABLE 17.
NUMBER OF NIH FRUIT AND VEGETABLE PROJECTS FOR 3 DIET-RELATED DISEASES, FY 2012/2013

	NIH Research Projects (#)	NIH Fruit and Vegetable Research Projects (#)	Fruit and Vegetable Projects as a % of NIH Projects
CANCER	14,818	194	1.3%
CORONARY HEART DISEASE	935	6	0.6%
STROKE	727	10	1.4%
TOTAL 3 DISEASES	16,480	210	1.3%

FIGURE 7.
PERCENT OF NIH SPENDING ON FRUIT & VEGETABLE PROJECTS VS. PERCENT RISK OF DISEASE DUE TO FRUIT & VEGETABLE CONSUMPTION GAP, FY 2012/2013

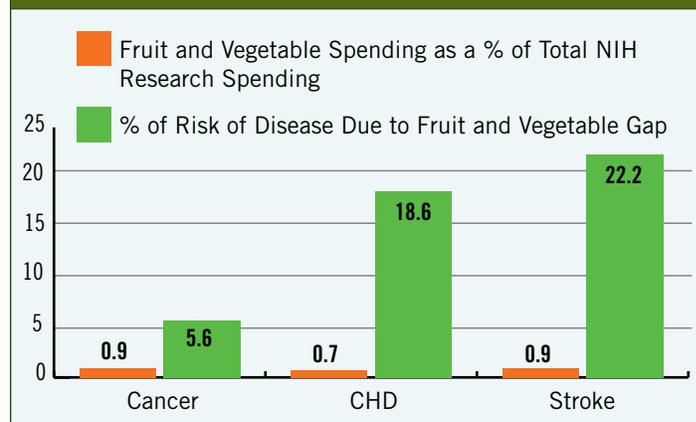


Table 18 shows that, even when only NIH disease *prevention* projects are considered, the percentage of NIH spending for fruits and vegetable prevention projects is far below the percent of the risk of chronic illness attributable to inadequate fruit and vegetable consumption. For example, the percent of stroke risk due to the fruit and vegetable consumption gap was 22 times as large as the percent of NIH fruit and vegetable spending related to stroke prevention spending in the FY 2012/2013 period.

When the focus of the inquiry is shifted to include only NIH *nutrition* projects, similar outcomes occur. As **Table 19** indicates, both the share of NIH projects devoted to fruits and vegetables (5.4%) and share of NIH spending for nutrition captured by fruit

and vegetable projects (7.0%) are far below the share of fruits and vegetables in the 2010 Dietary Guidelines daily food recommendations (41.4%).

To assess the direction of NIH's fruit and vegetable portfolio over time, **Table 20** compares NIH prioritization of fruit and vegetable projects for the FY 2008 and FY 2012/2013 periods. The comparison indicates that: 1) fruits and vegetables were very low priorities during both periods; and 2) little changed between 2008 and 2013 regardless of whether the frame of reference for the analysis of spending on the three chronic diseases is overall research projects, nutrition projects only, or disease-prevention projects only.

TABLE 18.
RISK AND NIH SPENDING ON FRUIT AND VEGETABLE DISEASE PREVENTION PROJECTS, FY 2012/2013

	Total Prevention Projects (\$)	Fruit and Vegetable Prevention Projects (\$)	Fruit and Vegetable Prevention Spending as a % of All Prevention Spending	% of Disease Risk Due to Fruit and Vegetable Consumption Gap
CANCER	1,863,740,746	51,021,016	2.7%	5.6%
CORONARY HEART DISEASE	165,972,618	3,182,621	1.9%	18.6%
STROKE	269,401,359	2,710,395	1.0%	22.2%
TOTAL	2,299,114,722	56,914,031	2.5%	

TABLE 19.
NIH PRIORITIZATION OF FRUIT AND VEGETABLE NUTRITION PROJECTS, FY 2012/2013

	NIH Nutrition Projects	NIH Fruit and Vegetable Nutrition Projects (All Diseases)	NIH Fruit and Vegetable Nutrition Projects as a % of NIH Nutrition Projects
NUMBER OF PROJECTS	4,241	230	5.4%
SPENDING ON PROJECTS (\$)	1,599,596,047	112,545,905	7.0%

TABLE 20.
CHANGES IN NIH RESEARCH PORTFOLIO FOR THE 3 CHRONIC DISEASES, FY 2008 AND FY 2012/2013

	% Dedicated to Fruits and Vegetables, FY 2008	% Dedicated to Fruits and Vegetables, FY 2012/2013
SPENDING ON NIH RESEARCH PROJECTS	0.8%	0.9%
NUMBER OF NIH RESEARCH PROJECTS	0.6%	1.3%
SPENDING ON NIH PREVENTION PROJECTS	3.2%	2.5%
NUMBER OF NIH NUTRITION PROJECTS	6.1%	5.4%

CDC Spending Priorities are Also Inconsistent with Disease Risk Factors

Table 21 compares CDC spending for tobacco prevention with fruit and vegetable spending from the perspective of the risks associated with tobacco use and the fruit and vegetable consumption gap. The combined risks for the three chronic diseases (i.e., cancer, coronary heart disease and stroke) that are attributable to each of the two causal factors are reported in rows (3) and (4) respectively.³⁷ Row (5) presents the ratio of the *disease risks* of the two causal factors while row (6) reports the ratio of the *CDC spending* for the two factors. A comparison of the two ratios indicates that actual spending for fruits and vegetables is inconsistent with the relative public health threats of the two disease-causing factors.

In the FY 2012/2013 period, tobacco prevention spending at the CDC was about 27 times the level of estimated CDC spending for the fruit and vegetable consumption gap in the agency's

Nutrition, Physical Activity and Obesity Division. However, tobacco's contribution to cancer, coronary heart disease and stroke risk was only 2.4 times the disease risk attributable to the fruit and vegetable consumption gap. Given the relative risks of the two causal factors, to bring fruit and vegetable spending in line with tobacco spending, fruit and vegetable spending would have to be equal to 42.3% of tobacco spending (row 5). In reality, it was only 3.7% of tobacco spending (row 6).

In other words, a risk-based approach to spending on fruits and vegetables that reflects FY 2012/2013 spending by CDC on tobacco prevention would require more than ten times the actual spending on fruits and vegetables that was estimated for the FY 2012/2013 period.

TABLE 21.
RISK-BASED ANALYSIS OF CDC SPENDING ON TOBACCO AND FRUITS AND VEGETABLES, FY 2012/2013

	Spending ³⁸ (\$ Millions)	Contribution to Risk of 3 Chronic Diseases	Ratios
(1) CDC estimated spending on fruits and vegetables	7.3		
(2) CDC actual spending on tobacco prevention	194.8		
(3) Percent of risk of 3 diseases attributable to fruit and vegetable consumption gap		12.0%	
(4) Percent of risk of 3 diseases attributable to tobacco use		28.4%	
(5) Fruit and vegetable risk compared to tobacco risk = (3)/(4)			0.423
(6) Fruit and vegetable spending compared to tobacco spending = (1)/(2)			0.037



Closing USDA's and HHS' Fruit and Vegetable Spending Gaps

Introduction

In previous sections of this report, USDA and HHS spending on fruits and vegetables and on nutrition education were found to fall far short of levels that would be needed to reflect chronic disease risks and Dietary Guideline recommendations for food-group intake. In this section, spending gaps and new levels of spending that would reflect closure of the gaps are estimated for the four major areas of inquiry in the previous sections: 1) overall USDA spending on fruits and vegetables; 2) USDA spending for nutrition education; 3) NIH spending on fruit and vegetable research projects; and 4) CDC spending for nutrition-related activities that promote fruit and vegetable consumption.



Closing USDA's Fruit and Vegetable Spending Gap

The second row of [Table 22](#) presents findings from [Tables 12 and 13](#) regarding the USDA fruit and vegetable spending gap. Although fruits and vegetables comprise 41.4% of daily food-group servings recommended in the 2010 Dietary Guidelines, fruits and vegetables represented only 14.7% of USDA spending on major food groups during the FY 2012/2013 period.

TABLE 22.
THE USDA FRUIT AND VEGETABLE SPENDING GAP, FY 2012/2013

PROGRAMS	Fruits and Vegetables (\$ Billions)	All Food Groups Combined (\$ Billions)	Fruit and Vegetable Spending as a % of Total Food Group Spending
ALL 4 PROGRAM AREAS, FY 2012/2013	2.692	18.336	14.7%
ESTIMATED SPENDING GAP	8.360	Not Applicable	Not Applicable
SPENDING AFTER CLOSING GAP	11.052	26.696	41.4%

If policy makers were to add money to USDA's overall budget or reallocate money from non-food group areas to the food-group budget to close the gap, an additional \$8.36 billion in spending on fruit and vegetable projects would be needed to bring the share of total spending allocated to fruits and vegetables to 41.4%. That spending gap is 3.1 times the size of actual annual fruit and vegetable spending in the FY 2012/2013 period. USDA spending on fruits and vegetables would have to more than quadruple from \$2.69 billion to \$11.1 billion.

Even though this would represent a large jump in food-group spending, especially in comparison to the NIH and CDC gaps, the USDA fruit and vegetable spending gap would equal only 5.7% of the entire annual average USDA budget (i.e., \$148 billion) for the FY 2012/2013 period.³⁹ Also, if USDA reallocated spending *among food groups*, for example, by cutting spending for the protein food group and shifting it to fruits and vegetables to increase the share of fruit and vegetable spending to 41.4%, the spending gap would be much lower (i.e., \$4.9 billion) and would be equal to only 3.3% of USDA total budget. A smaller spending gap occurs because the base from which the 41.4% share for fruits and vegetables would be calculated would shrink from \$26.7 billion to \$18.3 billion.

Closing USDA's Nutrition Education Spending Gap for SNAP

To produce an estimate of the kind of spending increase on nutrition education that would be needed at USDA to generate significant increases in fruit and vegetable consumption, the effective EFNEP program was used as the benchmark for recommended spending. SNAP participants were selected as the target audience for nutrition education program expansion and enhancement.

The total spending gap was calculated as the number of SNAP participants who did not participate in EFNEP or WIC times the difference in spending per program participant for nutrition education. It was also assumed that EFNEP-quality nutrition education programming could be provided to SNAP participants. Relevant data, some of which are drawn from [Tables 14 and 15](#), and the results of the calculation are reported in [Table 23](#).

As the table indicates, the added cost of bringing EFNEP-level nutrition education to all SNAP participants was estimated to be \$1.63 billion for the FY 2012/2013 period. Filling that spending gap would have required a nearly six-fold spending increase from \$342 million to \$1.97 billion. However, that increase would have been equal to only 2.1% of the \$79.2 billion average annual cost of the SNAP program in the FY 2012/2013 period.



TABLE 23.
THE SNAP NUTRITION EDUCATION SPENDING GAP,
FY 2012/2013

SNAP Nutrition Education Spending	\$342 million
Nutrition Education Spending per SNAP Participant	\$8.34
Nutrition Education Spending per EFNEP Participant	\$47.93
SNAP Nutrition Education Spending Gap per Participant = (EFNEP-SNAP)	\$39.59
SNAP Total Nutrition Education Spending Gap	\$1.627 billion
New SNAP Nutrition Education Spending if Filled Gap	\$1.969 billion
Nutrition Education Gap as a Percent of Total SNAP Budget	2.1%

Closing the NIH Fruit and Vegetable Spending Gap

To estimate the NIH fruit and vegetable spending gap, closure of the gap was defined as the point at which the ratio of NIH fruit and vegetable spending to prevention spending equaled the percentage of risk of cancer, coronary heart disease and stroke attributable to the fruit and vegetable consumption gap.

Table 24 reports the values of the relevant variables used to calculate the spending gaps for each disease, some of which are drawn from **Table 18**, and the outcomes of the calculations. NIH's fruit and vegetable spending gap, while much smaller than the USDA gaps, was equal to 7.1% of FY 2012/2013 spending for prevention projects covering cancer, coronary heart disease and stroke. It was also 2.9 times actual spending for prevention projects for the three diseases related to fruits and vegetables. However, closing the gap would require an additional expenditure by NIH equal to only 0.5% of the NIH budget.

Like the NIH fruit and vegetable spending gap, the estimate of the CDC fruit and vegetable spending is based on the risks of the three chronic diseases attributable to the fruit and vegetable consumption gap. In this case, as in the analysis of CDC spending in a previous section — see **Table 21** — CDC spending on tobacco prevention is used as the benchmark for an acceptable level of CDC prevention spending.

Table 25 contains the relevant data and outcomes. The first three rows of data in the table were drawn from **Table 21**. Row (3) represents the ratio of fruit and vegetable to tobacco spending that would occur if fruit and vegetable spending had been calibrated according to the risk of the three chronic illnesses attributable to the fruit and vegetable consumption gap.

Table 21 indicates that CDC's spending on fruits and vegetables was inconsistent with its disease-prevention spending related to tobacco use. To bring the CDC's fruit and vegetable spending in line with its tobacco prevention spending, from a risk perspective, would have required filling a spending gap that was 10.3 times as large as spending estimated for the FY 2012/2013 period. Closing the gap, however, would have required spending an amount equal to only 0.7% of average annual total CDC spending for the FY 2012/2013 period.

TABLE 25.
THE CDC FRUIT AND VEGETABLE SPENDING GAP,
FY 2012/2013

	CDC Spending (\$ Millions)
(1) CDC Actual Spending on Tobacco Prevention	194.8
(2) CDC Estimated Spending on Fruits and Vegetables	7.3
(3) Risk-Based Ratio of Fruit and Vegetable Spending to Tobacco Spending	0.423
(4) Risk-Based Spending for Fruits and Vegetables = (1) x (3)	82.4
(5) Fruit and Vegetable Spending Gap = (4) – (2)	75.1

TABLE 24.
NIH FRUIT AND VEGETABLE SPENDING GAP, FY 2012/2013

	Total Prevention Projects (\$)	Fruit and Vegetable Prevention Projects (\$)	Fruit and Vegetable Prevention Spending as a % of All Prevention Spending	% of Disease Risk Due to Fruit and Vegetable Consumption Gap	Risk-Based Share for Fruit and Vegetables	Additional Spending Needed to Close Risk-Based Gap
CANCER	1,863,740,746	51,021,016	2.7%	5.6%	107,534,221	56,513,205
CORONARY HEART DISEASE	165,972,618	3,182,621	1.9%	18.6%	37,197,714	34,015,094
STROKE	269,401,359	2,710,395	1.0%	22.2%	76,099,478	73,389,084
TOTAL	2,299,114,722	56,914,031			220,831,414	163,917,383

The Combined USDA and HHS Fruit and Vegetable Spending Gaps

Table 26 combines the outcomes reported in **Tables 22 through 25** regarding the spending gaps estimated in this report. The spending gaps are reported in the table in terms of dollar values and as a percentage of total USDA, NIH and CDC spending. **Figure 8** graphically depicts the fruit and vegetable spending gap.

The combination of the four, food-group-based, fruit and vegetable spending gaps analyzed in this report (see **Table 12**) were large in comparison to the actual spending that occurred during the FY 2012/2013 period. On average, the spending gaps were 3.3 times as large as actual spending if USDA increases food-group spending. If, on the other hand, USDA reallocated

food-group spending from other food groups to fruits and vegetables, the combined spending gaps would be 2.2 times as large as actual spending. (Had the USDA nutrition education spending gap for SNAP been included, those ratios of spending gaps-to-actual spending would have been considerably higher.) The ratios of spending gap-to-actual spending varied from 2.9 for NIH to 10.3 for CDC.



FIGURE 8.
SUMMARY OF FEDERAL FRUIT AND VEGETABLE SPENDING GAPS, FY 2012/2013

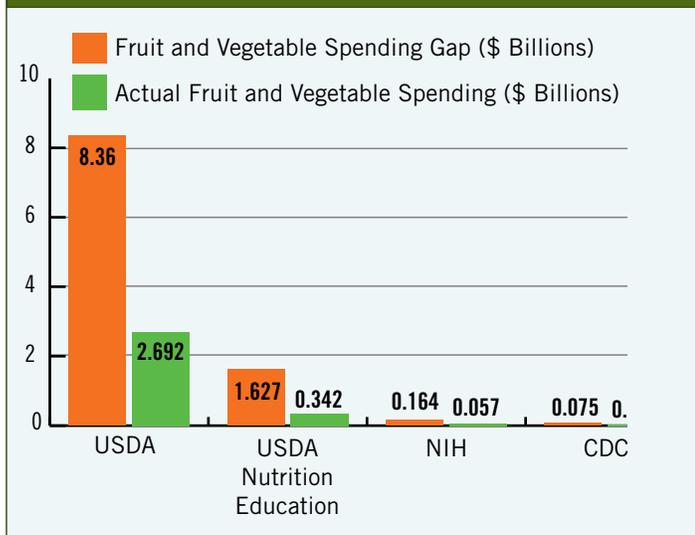


TABLE 26. SUMMARY OF FEDERAL FRUIT AND VEGETABLE SPENDING GAPS, FY 2012/2013

	FY 2012/2013 Budget (\$ Billions)	Actual Fruit and Vegetable Spending (\$ Billions)	Fruit and Vegetable Spending Gap (\$ Billions)	Spending Gap as a % of Total Budget
USDA	147.795	2.692	4.899 to 8.360	4.4% to 6.8%
USDA NUTRITION EDUCATION		0.342	1.627	
NIH	31.879	0.057	0.164	0.5%
CDC	10.718	.007	0.075	0.7%
TOTAL	190.392	3.098	6.765 to 10.226	3.6% to 5.4%

Summary and Conclusions

Although the combined total of the annual fruit and vegetable spending gaps estimated in this report appears quite large (\$6.77 billion to \$10.23 billion, [Table 26](#)), they need to be placed within the context of total federal agency spending. That spending gap was only a small portion (3.6% to 5.4%) of the total spending of USDA, NIH and CDC in the FY 2012/2013 period. This suggests that if policy makers redefined spending priorities and aligned them with public health realities, progress could be made in addressing the gaps without major disruptions.

The spending gaps identified in this report provide a benchmark for policy makers to understand the extent to which recent federal spending is out of synch with critical national public health challenges and recommendations. There is no guarantee that closing federal spending gaps will result in complete closure of the consumption gap. The precise relationship between federal spending and consumption has not been determined and is beyond the scope of this study. However, basic economic logic dictates that greater federal spending that encourages and subsidizes consumption and production of fruits and vegetables is bound to contribute to greater intake of those food products by Americans.

Similarly, although a comprehensive cost-benefit analysis is beyond the scope of this report, rapid progress in closing the spending gaps would almost certainly represent a solid investment for the nation given the potential gains in fruit and vegetable consumption. The combined spending gaps analyzed in this report equaled just 11% to 16% of the \$63.3 billion total economic cost of the fruit and vegetable consumption gap. And, that cost is expected to continue rising at a fairly rapid rate.

The 2014 Farm Bill: More of the Same or Breakthrough Legislation?

2014 Farm Bill Increases Fruit and Vegetable Spending

In the 2014 farm bill, Congress authorized increased spending for a number of existing fruit and vegetable programs, such as the Specialty Crop Research Initiative, the Farmers Market Promotion Program, the Specialty Crop Block Grant Program, pest and disease management, and higher levels of coverage under the federal crop insurance program. A new program, the Food Insecurity Nutrition Incentive Program (FINI) was also added to fruit and vegetable consumption by SNAP participants.⁴⁰ Those developments prompted the glowing comments of USDA Secretary Vilsack, in the box above, just two months after the new law was enacted.

“The 2014 Farm Bill has already set in motion and accomplished so much for our country. With historic support for specialty crop producers across the country, the bill will touch every one of our lives through one of the most basic of human needs: food. Specialty crops make up the bulk of what we eat — all of our fruits and vegetables, tree nuts and dried fruits — as well as things like cut flowers and nursery crops. They are half of MyPlate at every meal, and the daily source for most of our vitamins and nutrients.”

- USDA Secretary, Tom Vilsack. “Farm Bill Supports Specialty Crop Growers, Improves Access to Healthy Food,”
USDA Blog. April 18, 2014

The new additions to USDA’s fruit and vegetable spending are welcome steps in the right direction. They illustrate some of the kinds of actions that can be taken to rebalance USDA’s spending portfolio in favor of public health priorities. In the final analysis, however, they are not nearly large enough to have a significant impact on USDA’s fruit and vegetable spending gap.

While the impact of the new fruit and vegetable crop insurance provisions is unknown, the rest of the changes are estimated to add about \$120 million a year to USDA’s dedicated fruit and vegetable spending, which is equal to only about 1.4% of the high-end estimate of USDA’s annual fruit and vegetable spending gap for the FY 2012/2013 period reported in [Table 26](#). At that rate, since farm bills occur only once every five years, closure of the spending gap would take many decades. In the meantime, the nation would incur trillions of dollars in avoidable economic damage given the roughly \$300 billion five-year cost of the fruit and vegetable consumption gap.

“For years, fruits and vegetables have been treated as afterthoughts in agriculture policy, but with each farm bill comes a little more help.”

- Elahe Izadi. “Congress Starting to Pay More Attention to Fruits and Vegetables,” National Journal. September 18, 2013

Spotlight on the Food Insecurity Nutrition Incentive Program

The FINI program provides \$100 million over five years for SNAP participants to spend on fruits and vegetables at farmers markets and other outlets that provide an equal value of fruits and vegetables for free. If the entire \$100 million in federal funds is matched by other funding entities, the program would generate \$200 million worth of new fruit and vegetable purchases by SNAP participants, or an average of \$40 million a year in additional purchases.

This clever program has the potential to have a significant impact on the eating patterns of those SNAP participants who have access to the program. When compared with existing federal spending and the size of the spending gap, however, it is difficult not to conclude that the program will barely scratch the surface of the consumption gaps for the vast majority of SNAP participants.

Take the WIC program, for example, WIC’s contribution to fruit and vegetable purchasing power totaled an estimated \$1.16 billion per year for the FY 2012/2013 period, or \$132 per WIC participant.⁴¹ That funding accounts for 28% of the \$469 estimated to close the average American’s fruit and vegetable consumption gap.⁴²

In stark contrast to WIC, the \$40 million a year in additional purchasing power provided by FINI is equal to an average of \$.85 per SNAP participant. Even if the funding were allocated in a way that enabled it to fully close the consumption gaps of recipients, there would be enough for only 0.2% of SNAP participants (assuming they started with the average U.S. consumption gap). If spending available to each SNAP participant benefiting from the new program was equivalent to the fruit and vegetable purchasing power added by WIC, then funding for the new program would still cover only 0.6% of SNAP participants.

In short, funding provided by the 2014 Farm Bill for this innovative program, while insufficient at present, appears to have great potential to help close the consumption gap for SNAP participants, enabling the program to have a strong and widespread impact on the fruit and vegetable consumption gap, however, federal funding and matching funds would have to be increased by orders of magnitude.

The Research Questions Revisited: Summary of Key Findings of This Gap Analysis

As the country awaits the *Dietary Guidelines for Americans, 2015*, this report determined the extent to which recent federal spending during the FY 2012/2013 period was consistent with the 2010 Dietary Guidelines’ food consumption recommendations and the public-health risks of major diet-based chronic diseases. The report was framed in terms of seven empirical research questions, concerning fruit and vegetable consumption, the costs of under-consumption of fruits and vegetables, and federal spending on fruit and vegetable programs and projects.

The analyses in the previous sections of this report generated the following answers to those questions:

- Actual consumption of fruits and vegetables in the U.S. is far below the levels recommended in the 2010 Dietary Guidelines and those consumption levels have declined in recent years. Closing the consumption gap of the average American would require a 173% increase in daily fruit consumption and 77% increase in daily vegetable intake.
- Inadequate fruit and vegetable consumption increases the risks of widespread, deadly chronic diseases, such as cancer, stroke and coronary heart disease at an annual cost of more than \$60 billion during the FY 2012/2013 period and about \$300 billion for the five years between 2008 and 2013.
- Recent USDA spending that promotes production and consumption of major food groups is inconsistent with food consumption recommendations in the 2010 Dietary Guidelines. Fruits and vegetables, which account for more than 40% of all recommended servings accounted for only 15% of USDA food-group spending. The meat-dominated protein food group, which accounts for only 8% of all recommended servings accounted for half of USDA food-group spending.
- USDA spending on nutrition education, as part of nutrition assistance programs, such as SNAP and school meals, is grossly under-funded when viewed in the light of the EFNEP program, which has led to substantial increases in fruit and vegetable consumption by its participants.
- HHS spending on fruit and vegetable projects, through NIH and the CDC, fell far short of reflecting the risks of serious chronic illnesses associated with the fruit and vegetable consumption gap.
- No significant recent increases in federal spending to enhance fruit and vegetable production and consumption have been identified. The shortfalls in USDA and HHS spending

identified for the FY 2012/2013 period were the same or worse than the spending gaps identified in the 2010 Gap Analysis for FY 2008/2009. Moreover, the increases in dedicated fruit and vegetable spending in the 2014 Farm Bill represent a very small percentage of the USDA spending gap.

- The estimated nutrition education and fruit and vegetable spending gaps greatly exceed actual spending. For USDA, NIH and CDC combined, the total gap equaled 2.2 to 3.3 times actual spending levels. However that gap represented only 3.6% to 5.4% of their combined budgets. For NIH and CDC, the gaps were 0.5% and 0.7% of their budgets respectively.

These answers to the report's research questions demonstrate that federal spending continues to be inconsistent with expert public health recommendations and the public health challenges posed by the fruit and vegetable consumption gap. The persistence of

a large fruit and vegetable consumption gap combined with the heavy health risks and high costs associated with insufficient consumption should send a strong signal to policy makers that current food-group spending patterns need to be substantially shifted.

The findings of this report, the third of the series, also leave little doubt that current spending patterns reflect a failure to elevate closure of the fruit and vegetable consumption gap to a high-level federal government priority. Despite the continuing rhetoric by public policy officials in support of healthier diets and greater consumption of fruits and vegetables, little has changed in terms of federal spending. Although the fruit and vegetable spending increase in the 2014 Farm Bill was a step in the right direction, it was not large enough to make a significant impact on the fruit and vegetable spending gap.



Endnotes

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 - 2015 Dietary Guidelines Advisory Committee (DGAC). *Scientific Report of the 2015 Dietary Guidelines Advisory Committee, Part A - Executive Summary*. February, 2015. <http://www.health.gov/dietaryguidelines/2015-scientific-report/PDFs/Scientific-Report-of-the-2015-Dietary-Guidelines-Advisory-Committee.pdf> ("The dietary pattern characteristics being recommended by the 2015 DGAC reaffirm the dietary pattern characteristics recommended by the 2010 DGAC.")
 - Specific references and more-detailed explanations of methods used to estimate the performance indicators are provided in later sections of this report.
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 - See Rosenfeld, 2010.
 - USDA and HHS. "USDA Food Patterns," Appendix 7, *Dietary Guidelines for Americans, 2010*. 7th Edition. December, 2010. (See also: Table 5-1. "Eating Pattern Comparisons.")
 - Recent *National Health and Nutrition Examination Survey* (NHANES) findings were used to estimate an average U.S. daily caloric intake of 2,073. Recommended fruit and vegetable consumption for that caloric intake level was then estimated, using the 2010 Dietary Guidelines' recommendations for the 2,000 and 2,200 calorie daily diet.
 - For an expanded discussion of these relationships, see Rosenfeld, 2010.
 - Paolo Boffetta, Couto E., Wichmann, J. Ferrari, P. et al. "Fruit and Vegetable Intake and Overall Cancer Risk in the European Prospective Investigation Into Cancer and Nutrition (EPIC)," *Journal of the National Cancer Institute* 2010, 102(8).
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 - National Association of State Budget Officers. "State Expenditure Report: Examining Fiscal 2012-2014 State Spending." 2014. <http://www.nasbo.org/sites/default/files/State%20Expenditure%20Report%20%28Fiscal%202012-2014%29S.pdf>
 - <http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=2014/09/0215.xml>
 - The 2010 Dietary Guidelines consider fruits and vegetables as separate groups. In this report, they are combined into a single food group.
 - USDA and HHS, December 2010.
 - The recommendations for individuals with 2000-calorie and 2,200 calorie average daily intake in the 2010 Dietary Guidelines were used to determine recommendations for the average American, who had an estimated daily caloric intake of 2,073. The caloric intake of the average American was estimated in this report from 2006-07 NHANES survey results for consumers over 19 years of age and 2009-10 NHANES results for consumers 19 and under. These were the latest data available.
 - Sources for subsidy spending and data to allocate spending among uses of food commodities include: USDA, National Agricultural Statistics Service, *Agricultural Statistics*. 2013. http://www.nass.usda.gov/Publications/Ag_Statistics/2013/Agricultural_Statistics_2013.pdf. U.S. Office of Management and Budget (OMB). "Appendix: Budget of the U.S. Government, Fiscal Year 2015." March, 2014. <http://www.gpo.gov/fdsys/pkg/BUDGET-2015-APP/pdf/BUDGET-2015-APP.pdf> (Actual spending, FY 2013).
- For FY 2012 actual spending, see: <http://www.gpo.gov/fdsys/pkg/BUDGET-2014-APP/pdf/BUDGET-2014-APP.pdf>; USDA, Farm Service Agency. "Commodity Estimates Book: FY 2016 President's Budget." February, 2015. http://www.fsa.usda.gov/Internet/FSA_File/pb16_commodity_estimates.pdf (Actual spending, FY 2013) For actual spending, FY 2012, see: http://www.apfo.usda.gov/Internet/FSA_File/msr14_commodity_estimates.pdf. USDA, Risk Management Agency, Federal Crop Insurance Corporation. "Crop Statistics for 2012: Nationwide Summary by Crop." March, 2015. http://www3.rma.usda.gov/apps/sob/current_week/crop2013.pdf For 2013 crop insurance statistics, see: http://www3.rma.usda.gov/apps/sob/current_week/crop2012.pdf. USDA, Economic Research Service. "Oil Crops Yearbook." <http://www.ers.usda.gov/data-products/oil-crops-yearbook.aspx>. USDA, Economic Research Service. "Feed Grains: Yearbook Tables." <http://ers.usda.gov/data-products/feed-grains-database/feed-grains-yearbook-tables.aspx>. USDA, Economic Research Service. "Livestock and Meat Domestic Data." <http://www.ers.usda.gov/data-products/livestock-meat-domestic-data.aspx>.
- USDA, Cooperative State Research Education and Extension Service. Table C: National Summary USDA, SAES, and Other Institutions, by Subject of Investigation, Fiscal Year 2012 Funds." *Current Research Information System (CRIS)*. March, 2013. <http://cris.csrees.usda.gov/crisfin/2012/12tablec.pdf> For FY 2013 funding data, see: <http://cris.csrees.usda.gov/crisfin/2013/13tablec.pdf>

22. USDA spending on SNAP, formerly known as the Food Stamp Program, was not included in the analysis of USDA food-group spending. This section of the report includes only spending allocations made directly by Congress and USDA that divide available funding among the primary food groups. SNAP dollars are allocated among the major food groups by the purchasing decisions of program participants, rather than decisions by policy makers.
23. USDA, AMS. For access to AMS FY 2012 and FY 2013 "Purchase Summary Reports", see: <http://www.ams.usda.gov/AMSV1.0/ams.fetchTemplateData.do?template=-TemplateJ&page=CPDAnnualPurchaseSummary>
24. A summary of total annual spending per commodity purchased by the FSA for nutrition assistance programs during FY 2012 and FY 2013 (e.g., grains, and grain, dairy, vegetable-oil, and peanut products) was obtained from FSA thanks to its timely response to a FOIA request in February 2015.
25. WIC spending estimates were derived from cost estimates found at <http://www.fns.usda.gov/wic/regspublished/WICfoodpkg-additionaldataforRIA.pdf> and participation data found in USDA, Food and Nutrition Service, Office of Policy Support. "WIC Participant and Program Characteristics, 2012, Final Report." December, 2013. <http://www.fns.usda.gov/sites/default/files/WICPC2012.pdf>. For details on the rule that established the fruit and vegetable voucher program, see: <http://www.fns.usda.gov/wic/regspublished/wicfoodpkginterimrulepdf.pdf>.
26. The net cost of federal management of programs to support livestock grazing on federal lands was calculated as program spending minus grazing fees paid by ranchers. The calculation included grazing programs on U.S. Forest Service and Bureau of Land Management lands. See: Glazer, Christine, et al. "Costs and Consequences: The Real Price of Livestock Grazing on Public lands." *Center for Biological Diversity*. January, 2015.
27. Spending data for administration of commodity-specific programs were drawn primarily from: OMB, March, 2014; OMB, April, 2013; USDA, Office of Budget and Program Analysis. "2014 Explanatory Notes Animal and Plant Health Inspection Service." <http://www.obpa.usda.gov/exnotes/FY2014/18aphis2014notes.pdf>
28. FY 2012/2013 spending for grains, dairy, protein foods, oils, and fruits and vegetables were \$3.423 billion, \$1.731 billion, \$9.076 billion, \$1.412 billion, and \$2.692 billion, respectively.
29. USDA fruit and vegetable spending declined from \$3.4 to \$2.7 billion between the FY 2008/2009 and FY 2012/2013 periods.
30. EFNEP serves low-income Americans. However, it is not part of any other nutrition assistance program.
31. Lorrene Ritchie, Whaley, S., Spector, P., Gomez, J., Crawford, P. et al. "Favorable Impact of Nutrition Education on California WIC Families," *Journal of Nutrition Education and Behavior*. (42)3(May/June) 2010.
32. Some local SNAP-Ed nutrition education programs spend far more than the average EFNEP program. However, their impacts on fruit and vegetable consumption are typically far lower than EFNEP's impacts. (For SNAP-Ed impacts, see, for example, the reports produced for USDA's Food and Nutrition Service: Gabor, Vivian, et al. "SNAP Education and Evaluation Study: Final Report (Wave I)," *Nutrition Assistance Program Report*. January, 2012 <https://origin.drupal.fns.usda.gov/snap-education-and-evaluation-study-wave-i-final-report>; and Long, Valerie, et al. "SNAP Education and Evaluation Study: Final Report (Wave II)," *Nutrition Assistance Program Report*. December, 2013 <http://www.fns.usda.gov/sites/default/files/SNAPEdWaveII.pdf>. The very low per-participant spending level for SNAP is the result of spreading the available \$343 million in SNAP-Ed funding across 47.1 million SNAP program participants.
33. The EFNEP program includes 5 topical areas. Two of these categories, or 40%, were considered nutrition education. Therefore, only 40% of spending per participant is reflected in this table. See <http://nifa.usda.gov/efnep-national-datta-reports> for details.
34. NIH, HHS. NIH RePORTER website. <http://projectreporter.nih.gov/reporter.cfm>
35. OMB, March, 2014; and OMB, April, 2013.
36. These estimates were taken from Table 3.
37. Tobacco-related diseases risks were obtained from: American Cancer Society. "Tobacco-related Cancer Fact Sheet." <http://www.cancer.org/cancer/cancercauses/tobaccocancer/tobacco-related-cancer-fact-sheet>; U.S. Surgeon General, HHS. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. 2014. <http://www.surgeongeneral.gov/library/reports/50-years-of-progress/Campaign-for-Tobacco-Free-Kids-Health-Harms-from-Smoking-and-Other-Tobacco-Use.pdf>. July, 2014. <http://www.tobaccofreekids.org/research/factsheets/pdf/0194.pdf>. The risks reported in this table have been weighted by the percentage of the combined deaths due to each disease. See: CDC, HHS. "2012 Mortality Multiple Cause Micro-data Files." http://www.cdc.gov/nchs/data_access/Vitalstatsonline.htm.
38. CDC, HHS. "Fiscal Year 2015 Justification of Estimates for Appropriation Committees." 2013. (FY 2013 spending data) http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2015_CJ_CDC_FINAL.pdf. For the FY 2014 version, which contains FY 2012 spending data, see: http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2014_CJ_CDC_FINAL.pdf
39. For USDA's total budget, see: OMB, March, 2014; and OMB, April, 2013. The spending gap would also be equal to 10.6% of annual average spending for SNAP.
40. USDA. "2014 Farm Bill Highlights." <http://www.usda.gov/documents/usda-2014-farm-bill-highlights.pdf>; USDA. "USDA Provides Greater Protection for Fruit, Vegetable and Other Specialty Crop Growers," *Press Release*. December 12, 2014. <http://www.usda.gov/wps/portal/usda/usdahome?contentid=2014/12/0269.xml>
41. See the discussion and endnotes concerning Table 10 on page 18.
42. According to USDA, in 2008, it took between \$2.00 and \$2.50 in fruit and vegetable purchases to buy enough to meet the US 2010 Dietary Guidelines recommendations for fruits and vegetables for a person with a 2,000 calorie daily diet. The CPI for fruits and vegetables in 2013 was 1.071 times the fruit and vegetable CPI for 2008. The average caloric intake in the U.S. was estimated to be 2,073 calories or 1.041 times 2,000 calories. The average fruit and vegetable consumption gap was equal to 51.2% of the US 2010 Dietary Guidelines recommendation. Based on USDA's 2008 cost estimate, an average daily cost of \$2.25 is assumed. Multiplying these terms yields a cost of \$469 per year in spending for fruits and vegetables for an individual to close the average U.S. consumption gap.





7465 Lancaster Pike, Suite J, 2nd Floor | Hockessin, DE 19707
Phone: 302.235.2329 | Fax: 302.235.5555
PBHFoundation.org | FruitsAndVeggiesMoreMatters.org

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