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Trends in USDA Foods Ordered for Child Nutrition Programs Before and After Updated Nutrition Standards

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Trends in USDA Foods Ordered for Child Nutrition Programs Before and After Updated Nutrition Standards

Michael Ollinger and Joanne Guthrie

Abstract

Nutrition standards for the USDA's National School Lunch program were updated in 2012, with changes requiring more fruit and vegetables. Most of the foods served in school meals come from commercial sources, but USDA also offers foods to schools in a program called USDA Foods. In this program, schools acquire foods procured by USDA using entitlement funds assigned to each State. USDA Foods assists schools financially and may help schools meet nutrition standards. This report examines changes in food choices in the USDA Foods program during 2006–17 in response to revised nutrition standards. The report finds that (nationally) the value of fresh fruits and vegetables ordered from USDA Foods and distributed by the U.S. Department of Defense (DoD) (under the USDA DoD Fresh Fruit and Vegetable Program (DoD Fresh)) rose from 5 to 15 percent of the value of all USDA Foods orders. The value of fruits ordered through USDA Foods—mainly canned and frozen—rose from 9 to 15 percent of the value of USDA Foods orders during 2012–17—while the value of cheese, meat, and poultry as a percent of entitlement funds—dropped 10 percent. There were also other changes in food choice supportive of revised nutrition standards.

Keywords: The United States Department of Agriculture (USDA) Department of Defense (DoD) Fresh Fruit and Vegetable Program, Foods in Schools program, Healthy Hunger-Free Kids Act, National School Lunch Program, NSLP, Child Nutrition, USDA Foods, USDA commodities, nutrition standards

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Trends in USDA Foods Ordered for Child Nutrition Programs Before and After Updated Nutrition Standards

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What Is the Issue?

In addition to cash meal reimbursements, USDA helps compensate schools for the cost of meals served through the National School Lunch Program (NSLP) through a program called USDA Foods in Schools (USDA Foods). Under the USDA Foods Program, USDA purchases foods from suppliers on behalf of schools, using entitlement funds made available for that purpose on the basis of the number of school lunches served in the previous year. Foods offered in the USDA Foods Program include foods typically included in school meals—such as cheese, meat, fruits and vegetables, and grain products—and are selected with input from Federal, State and local program staff. Each year, States select from foods available and can obtain fresh fruits and vegetables from the USDA Department of Defense (DoD) Fresh Fruit and Vegetable (DoD Fresh) Program. DoD Fresh permits States participating in USDA Foods to obtain fresh fruits and vegetables from the DoD Defense Logistics Agency (DLA) of Philadelphia.

USDA Foods provided 11 percent of the value of foods obtained by USDA school meal programs in school year 2009–10 (the most recent available data on school food purchasing). In 2021 dollars, this number would translate to a value of about \$1.40 billion for the 50 States and the District of Columbia. USDA budget figures indicate that spending on USDA Foods has not changed in real terms from 2011 to 2018 (the last available budgetary data). Besides the financial support, USDA Foods also increased school food service access to healthy options that align with USDA school meal nutrition standards (USDA, FNS, 2021) and can help school food authorities (SFAs) meet nutrition standards.

Passage of the Healthy, Hunger-Free Kids Act in 2010 resulted in major updates in school meal nutrition standards that began to be implemented in 2012. These updates required USDA school meals to include whole-grain-rich foods, more fruits and legumes, and a broader mix of vegetables (including dark green and red/orange vegetables). The purpose of this report is to examine changes in food choices in the USDA Foods program during 2006–2017 in response to revised nutrition standards implemented in 2012.



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What Did the Study Find?

- In the years following implementation of updated nutrition standards, foods made available to schools through the USDA Foods Program included more products that supported achievement of the standards, such as dark green vegetables and whole grains. Product offerings were also included with reduced fat, sodium, and sugar content.
- The percent of fruits and vegetables distributed through the USDA Department of Defense (DoD) Fresh program rose sharply, from 6 percent of total USDA Foods distributed in 2012 to 15 percent of total USDA Foods entitlement funds used in 2017.
- Fruit from USDA Foods—mainly canned and frozen—as a percent of total USDA Foods entitlement funds used, rose 66 percent, from 9 percent in 2012 to 15 percent in 2017.
- Cheese, poultry, and red meat obtained with USDA entitlement funds dropped to a range of 60–70 percent of USDA Foods entitlement funds used during 2012–17 (from 65 to 75 percent of USDA Foods entitlement funds used during 2006–11).

How Was the Study Conducted?

Data were compiled from USDA Budget Explanatory Notes, as provided by the USDA Food and Nutrition Service (FNS) for fiscal years (FYs) 2008–19. These notes indicate past, current, and proposed budgets, past expenditures, and agency and program information. The Budgetary Notes for FNS identify food obtained with USDA Food entitlement funds under the USDA Foods program. For this study, foods were categorized by food type and quality. For example, green beans were placed in the other-vegetable category, consistent with their classification in school meal guidelines. Data were then summarized graphically and evaluated, with means tests between the periods before and after changes in nutrition standards and trend analysis during 2006–17.

Trends in USDA Foods Ordered for Child Nutrition Programs Before and After Updated Nutrition Standards

Introduction

How USDA Foods Program Supports USDA Child Nutrition Programs

Across the United States, approximately 100,000 public and private nonprofit schools participated in USDA's National School Lunch Program (NSLP) in FY 2019, served about 4.9 billion lunches and 2.45 billion breakfasts (USDA, ERS, 2021).¹ Schools participating in the NSLP must serve meals that meet Federal nutrition standards and make the meals available to all students, with low-income students receiving meals for free or at a reduced price.² In return, USDA provides schools with cash meal reimbursements (that are established annually) with varied reimbursement levels, depending on whether meals are served for free or at a reduced or full price. USDA also provides schools participating in the NSLP with entitlement funds that can be used to order foods called USDA Foods (Ralston et al., 2008). Under the USDA Foods Program, USDA purchases foods from suppliers (on behalf of State agencies) that distribute foods to schools; schools pay for the foods with entitlement funds assigned to each State based on the number of lunches served.

USDA Foods (per-meal) support levels are established annually based on the number of lunches served the previous year but do not vary by whether a meal is free, at a reduced price, or at full price. Although cash reimbursements comprise the majority of USDA financial support to schools, USDA Foods offers an additional resource for local school food authorities (SFAs) who plan menus, purchase foods, and oversee food service and are usually part of the local school district and are usually part of the local school district. The use of USDA Foods entitlement funds also supports U.S. agriculture because those foods must be grown and processed within the United States. USDA Foods are nutritious foods that meet USDA's nutrition standards and fit within typical school menus. Schools have responded to the USDA Foods product offerings by making USDA Foods a major part of their school meal programs. In SY 2009–10, USDA Foods comprised 11 percent of the value of all food obtained by schools, and USDA Foods played a large role in supplying cheese, meat, poultry, and fruit and vegetables—accounting for 51 percent of cheese, 37.5 percent of red meat, 43.8 percent of poultry, 31 percent of fruit, and 17 percent of vegetables. Fruits and vegetables were primarily canned or frozen. USDA Foods provided less than 5 percent of bread/baked products, dairy other than cheese, desserts, grains, juices, and prepared foods (Young et al., 2012). The contribution of USDA Foods to student meals makes the nutritional content of these foods important to the meal's overall diet quality, prompting USDA to adjust its food offerings when nutrition standards change. Beginning in the mid-1990s, USDA reformulated USDA Foods products to lower the levels of fat, sodium, and sugars—and has added products such as whole-grain pasta and brown rice that can be used by school food services to meet USDA nutrition standards (USDA, FNS, 2020). Following a pilot study in school year (SY) 1994–95, USDA

¹ The ongoing pandemic has stressed the food system, reducing the number of meal servings in 2020 and 2021. The pandemic has encouraged States to take innovative approaches to make meals available to eligible participants by offering take-home meals from community centers, churches, and other centralized facilities and by providing home delivery, multiple-meals in one pick-up or delivery, 7-day service, etc. (Kinsey, 2020).

² About two-thirds of National School Lunch Program (NSLP) participants qualify for free meals because the participants live in a household with an income below 185 percent of the Federal poverty level, making the program the second largest anti-hunger program offered by USDA (Tiehen, 2020).

started a program within USDA Foods called the USDA DoD Fresh Fruit and Vegetable Program (DoD Fresh), which permits States to obtain fresh fruits and vegetables from the Department of Defense’s (DoD) Defense Logistics Agency (DLA).³

USDA began a major update of its food offerings after the Healthy, Hunger-Free Kids Act (HHFKA) became law in 2010 and the updated school meal standards it required began to be implemented in 2012. USDA Foods offerings began to emphasize low- or no-salt added canned vegetables, canned fruits packed in extra-light syrup or water, and dark green vegetables (see the box called “Highlights of updated standards for school lunches and breakfasts after implementation of the Healthy, Hunger-Free Kids Act in 2012 compared to prior standards” for a detailed description). The use of revised food offerings from USDA Foods and changes in foods purchased from commercial vendors resulted in meals that met updated standards and improved the diets of children participating in USDA school meal programs. Kenney et al. (2020) found the prevalence of obesity would have been 47 percent higher in 2018 for children in poverty if HHFKA had not become law. More broadly, Smith et al. (2021) showed that participation in USDA school food programs improved the overall quality of participating children’s diets.

The updated standards include: (1) A reduction in the amount of sodium and saturated fats permitted in meals offered to students, (2) an elimination of the use of trans fats, (3) and a requirement of the regular inclusion of whole fruit, dark green and red/orange vegetables, legumes, and whole grains (Guthrie and Newman, 2013).

We use national data given in the Budgetary Explanatory Notes for the USDA budgets (fiscal years (FYs) 2008–19) to illustrate how the use of entitlement funds from USDA Foods changed over 2006–17. Results inform our understanding of how the USDA Foods program supports SFAs in providing nutritious school meals to U.S. children while staying within their budget constraints.

The Historical Context and Value of USDA Foods

USDA has provided foods—often referred to as commodity foods—to schools since 1936, when USDA was authorized to purchase surplus farm commodities and distribute them to local school lunch programs (Ralston, 2008). The USDA Foods program has continued to this day, benefitting childhood nutrition by providing low-cost foods for student meals and supporting U.S. agriculture by requiring all purchases be grown and processed in the United States or its territories.

Congress dramatically changed its support of funding for school meals when it enacted the National School Lunch Act of 1946. Under this legislation, USDA provided cash reimbursements to schools that participated in the USDA National School Lunch Program (NSLP). This program was in addition to the pre-existing USDA Foods program and currently comprises the lion’s share of USDA support for the local SFAs that provide meals and snacks through the NSLP and the School Breakfast Program (SBP). Cash reimbursements provided 57 percent of SFA revenues in school year (SY) 2014–15 while USDA Foods contributed an additional 6 percent of revenues (Logan et al., 2019).

³ Under the USDA Department of Defense (DoD) Fresh Fruit and Vegetable Program, States contact the Defense Logistics Agency (DLA) to place an order for produce. The States pay for the food with entitlement funds and receive supplies from the same supplier that serve military bases.

Each SFA is entitled to use USDA Foods entitlement funds to obtain products available from the USDA Foods “Foods Available List.” Each State is offered an entitlement amount equal to the number of lunches served in the previous year times a per-meal dollar amount established annually by USDA based on changes in the Price Index of foods used in schools and institutions (USDA, 2016). In 2019, the entitlement mandated by law was valued at \$0.235 per lunch.⁴ This serves as a guaranteed minimum.

NSLP authorizing legislation also requires that total USDA Foods assistance (i.e., the value of the entitlement) equals at least 12 percent of all NSLP reimbursements (USDA, FNS, 2020). Thus, schools receive the higher of either the entitlement established by law (and adjusted by USDA for inflation) or 12 percent of all NSLP reimbursements. Because the effective cash value at the 12-percent rate was \$0.3625 per lunch in 2019, States received \$0.3625 per lunch.⁵ There is one national value that does not vary geographically and serves as a minimum value per lunch that States receive. States can receive more funding if conditions warrant. SFAs do not receive additional USDA Foods entitlements for SBP breakfasts served, but SFAs can select foods from USDA Foods for use in breakfasts.

In addition to the annually budgeted funds for USDA foods, USDA can make “bonus foods” available to schools. These are specific foods deemed to need market support at a given moment in time because of over-supply. The foods are offered to States on a fair-share basis and do not count against a State’s regular entitlement dollars.

The Food Ordering Process

School food authorities (SFAs) and State agencies work together to order USDA Foods based on a list of foods published on the Foods Available List (FAL), which is provided annually by USDA’s Food and Nutrition Service (FNS), and the entitlement value of the orders. USDA Foods available on the FAL are identified by FNS with input from State and local SFAs and other stakeholders. Food offerings are intended to help schools meet meal pattern requirements (Kriviski and Castro, 2015).

USDA Foods are purchased on behalf of States and SFAs by USDA’s Agricultural Marketing Service (AMS), which gathers competitive bids or negotiates contracts with suppliers that provide shipping to the destination. Foods can be delivered for use in the form offered to States or can be diverted to commercial food processors for use in products that will be used in school meals. For example, cheese can be used for making pizza, or bulk chicken can be used for preparing chicken nuggets or breaded patties. Shipping basic commodities, such as whole chickens, to processors to produce chicken nuggets and other foods has proven to be very popular—accounting for more than 42 percent of all USDA Foods obtained with entitlement funds in SY 2009–2010 (Young et al, 2012).

Each State agency coordinates delivery of USDA Foods for use within its State and is responsible for all storage and transportation costs after the State receives shipments from the supplier. FNS encourages State agencies to offer SFAs direct shipments of USDA Foods (USDA, FNS, 2012).

Prior research indicates that AMS purchasing practices enabled SFAs to acquire USDA Foods at prices—in entitlement value—that are often lower than those available on the open market. The studies are dated and need to be re-examined, but they do provide evidence of price differences. MacDonald et al. (1998) found that USDA’s purchase price was about 30 percent lower than the price of the six commercially available

⁴ The webpage entitled “Value of Donated Foods” on the FNS website has values over 2009–2020.

⁵ Exceptions were Kansas and 56 commodity letter of credit (CLOC) districts that were part of a pilot study, providing cash in lieu of commodities in the 1980s. They received cash in lieu of a USDA Foods entitlement, with the requirement that they spend the money to support specific agricultural markets. The pilot study was discontinued, but States were given the option of receiving the cash value. Kansas is the only State that retained this status.

products sampled in the study. Peterson (2009) provides more nuanced evidence of price differences, finding that while commercial foods in Minnesota were on average 17 percent more expensive than USDA Foods, 25 percent of USDA Foods items were more expensive than equivalent locally available commercial items and that transportation and storage costs were typically higher for USDA Foods than their commercial equivalents. Finally, Young et al. (2012) indicates that 54 percent of SFAs believed that USDA Foods were a good value and reduced their overall food costs.

FNS provides State agencies with guidelines to follow when establishing their purchasing practices. These guidelines suggest that States offer SFAs the full variety of USDA Foods on the FNS USDA Foods Available List to the extent practical. If agencies do not offer all foods, they should take the food preferences of SFAs into account. According to data collected by FNS from State agencies in school year (SY) 2013–14, 36 percent of State agencies allowed SFAs in their State to order from the full list of foods available; the remainder offered a subset based on input from their SFAs (Murdoch et al., 2016). According to Standing et al. (2016) in table VI-3.1, State agencies that did not allow SFAs to order from the full list of USDA Foods used multiple mechanisms to offer SFAs the foods they wanted. About three-fourths (76.5 percent) of State agencies obtained feedback from SFAs about which foods to offer by surveying all SFA directors; nearly two-thirds (64.7 percent) of State agencies used an advisory council comprised of SFA directors; and more than half (58.8 percent) of State agencies obtained feedback from SFA directors at annual State distribution meetings.

FNS also encourages State agencies to allow SFAs to submit USDA Foods orders throughout the school year. In practice, in SY 2012–2013, 28 percent of SFAs allowed ordering once yearly, 9 percent allowed ordering twice yearly, and 63 percent allowed it more than twice (Standing et al., 2016). Finally, FNS permits States to carry USDA Food entitlements forward to the following year. In SY 2013–14, 60 percent of State agencies reallocated or carried forward unused USDA Food entitlements at the end of the school year (Murdoch et al., 2016).

USDA Foods Change to Support Nutrition Standards

The USDA Foods that are offered to schools have changed over time with changes in the *Dietary Guidelines for Americans*. As part of the 1995 School Meals Initiative, USDA established limits on the fat and saturated fat content of school meals (USDA, 1995). USDA Foods began offering lower fat meat, poultry, and cheese products (Ralston et al., 2008). A study of USDA Foods used in California schools recommended continued efforts to offer products that aligned with Federal dietary recommendations (Hecht et al., 2008). FNS now offers numerous fruits and vegetable options with low or no added salt or sugars (USDA, FNS, 2016).⁶ Those changes are illustrated in the next section.

USDA Foods has traditionally offered commodity products that can be prepared in the school or processed at a food manufacturer into a product compatible with local and ethnic tastes. In recent years, changes to product offerings were made to better accommodate cultural influences and changes in tastes. For example, SFAs have been ordering salsa, taco fillings, and refried beans since 2006 and tortillas since 2010.

USDA Foods is also attempting to provide more fresh produce. The Farm Security and Rural Investment Act of 2002 allocated \$50 million in entitlement funds to be used annually for direct acquisitions of fresh fruits and vegetables in the DoD Fresh program for SYs 2003–06 (Ralston et al., 2008).⁷ In this program, SFAs use entitlements funds to obtain fresh fruits and vegetables directly from the Defense Logistics Agency (DLA).

⁶ USDA Foods offers fresh (usually in bulk), frozen, canned, and dried fruits and vegetables. Bulk foods obtained using entitlement funds are often shipped to processors for making into french fries and other processed products. Other products are received directly from the vendor. Fresh fruits and vegetables also come from the USDA DoD Fresh Fruit and Vegetable Program (DoD Fresh).

⁷ We have data on the total use of USDA Foods entitlement funds for fruits and vegetables in the USDA DoD Fresh program and use these data later in the report. We do not have disaggregated data.

Frozen, canned, and other semi-processed vegetables typically come from USDA Foods through its established food procurement program. In SY 2009–10, 30.5 percent of SFAs used USDA Foods entitlement funds to obtain USDA DoD fresh fruits and vegetables (Young et al., 2012).

In 2010, the National Academy of Sciences (NAS) report *School Meals: Building Blocks for Healthy Children* provided recommendations to USDA for updates to the NSLP and SBP meal patterns and nutrition standards in order to conform with the *Dietary Guidelines for Americans*. These recommendations stressed the need for regular inclusion of dark green and red/orange vegetables, whole fruit, whole grains, legumes, and other fruits and vegetables (Stallings et al., 2010). When USDA proposed updated menu standards for the NSLP and SBP (based on these recommendations and the Healthy, Hunger-Free Kids Act (HHFKA)), it received comments expressing concerns regarding the availability and cost of some of the products that would be needed to meet the new standards—for example, whole grain products.⁸ As part of its response to these comments, the USDA, Food and Nutrition Service (FNS) noted that USDA Foods offered many such products. For example, for grains, they offered brown rice; rolled oats; whole-wheat flour; whole-grain kernel corn; and whole-grain rotini, spaghetti, and macaroni (USDA, FNS, 2012).

Updated menu standards were implemented gradually, and USDA Foods consistently included foods selected to assist SFAs in serving meals that meet standards.⁹ Products are offered in a variety of forms, including individualized servings for convenient preparation and service—such as applesauce cups and frozen fruit cups—and bulk products—such as drums of tomato paste—for districts that do more scratch cooking (USDA, FNS, 2016). Product offerings include lean meat and poultry products, reduced-fat cheeses, and a wide range of whole-grain options (as aforementioned). Artificial trans fats are not permitted in any USDA Foods products. Low- and no-salt added canned and frozen vegetables and legumes replaced their more traditional counterparts with added salt. The fruits component includes fresh, frozen, dried fruit, canned fruit packed in extra-light syrup or water, and pasteurized 100-percent full-strength fruit juice. All fruits except dried are credited based on volume (cups); dried fruits are credited as twice the volume served, e.g., one-fourth cup of raisins credits as one-half cup of the fruit component. Fruit juice cannot exceed half of the weekly fruit offerings.

⁸ USDA's national survey of school food authority (SFA) directors in school year (SY) 2012–13 found 25 percent of them identified the availability of food products that met standards to be a very or extremely challenging, ongoing issue, while 34 percent considered it a minor or moderate challenge (Standing et al., 2016).

⁹ In SY 2013–14, the USDA FNS Foods Available List (FAL) included a color-coded key indicating how items fit menu requirements.

Table 1

Highlights of updated standards for school lunches and breakfasts after implementation of the Healthy, Hunger-Free Kids Act in 2012, compared to prior standards¹

	Lunch		Breakfast	
	Updated nutrition standards	Prior nutrition standards (food-based option)	Updated nutrition standards	Prior nutrition standards (food-based option)
Milk	Must be 1 percent fat or fat-free	Whole, reduced-fat, low-fat, fat-free milks (plain or flavored)	Must be 1 percent fat or fat-free	Whole, reduced-fat, low-fat, fat-free milks (plain or flavored)
Fruit	Increased servings: Must be served daily, no more than half of servings can be from juice	Considered as part of a single "Fruit and Vegetable" group with fewer required servings; no restrictions on juice	In school year 2014–15, begin offering increased servings that must be served daily, with no more than half of servings from juice	Fewer required servings; no restrictions on juice
Vegetables	More variety, with weekly minimum requirements for dark green, red/orange vegetables; beans/peas (legumes); starchy and other vegetables to meet weekly amount required	Considered as part of a single "Fruit and Vegetable" group with fewer required servings; no specific requirements for the type of vegetable	May be offered in place of fruit	Considered as part of a single "Fruit and Vegetable" group with fewer required servings; no specific requirements for the type of vegetable
Grains	At least one-half of all grains must be whole grain rich ² ; in school year 2014–15, all grains offered must be whole-grain rich	No requirement for whole grains	At least one-half of all grains must be whole-grain rich: In school year 2014–15, all grains offered must be whole-grain rich	Not requirement for whole grains
Meat/meat alternates	Weekly maximum (for older students) reduced from 15 ounces to 12 ounces; schools have flexibility in implementing this standard through school year 2013–14; they should consider it a goal but are not required to limit amounts to weekly maximum ³	Weekly maximum of 15 ounces	May be served in place of grains once daily grain minimum is met	Could be served as an alternative to grain servings

¹ Unless otherwise noted, lunch changes were required by school year (SY) 2012–13 and breakfast changes were required starting SY 2013–14. New standards also required limits on the sodium content of meals, whereas prior standards did not include sodium limits.

² USDA relaxed the whole-grain standard to a requirement that half of all grains served weekly had to be whole-grain rich. The original regulation required all grains be whole-grain rich by SY 2014–2015.

³ The maximums were later waived for compliance (same with grains).

Source: USDA, Economic Research Service. Information on new standards is adapted from Guthrie and Newman, 2013; information on prior standards is adapted from Stallings et al., 2010.

In SY 2012–13, approximately 70 percent of SFAs reported changing the types and amounts of USDA Foods they ordered to meet the new nutrition standards (Standing et al., 2016).¹⁰ Some specific changes reported by SFA directors included making additional fruit and vegetable orders through USDA Foods and/or USDA DoD Fresh (Standing et al., 2016), ordering whole grain-rich products from USDA Foods more often (Murdoch et al., 2016), and ordering low-sodium products more often (Murdoch et al., 2016).

Changes in USDA Foods Obtained With Entitlement Funds During 2006–17

To our knowledge, there have been no empirical studies of changes in the use of USDA Foods over time as nutrition standards have changed. To help fill this void, we use data from the USDA Budget Summaries in the USDA Budget Explanatory Notes, as provided by USDA, FNS, for fiscal years (FYs) 2008–19. Among other things, the notes indicate past, current, and proposed USDA budgets—past expenditures, and agency and program information. The part pertinent to USDA Foods identifies the food types and their values at the national level. We used that information to examine changes in the foods obtained with USDA Foods entitlement funds over 2006–17, a period that allows time to evaluate the impact of updated nutrition standards (implemented in 2012) on food choices. Data from 2017 were the most recent available from FNS documents at the time of the study. These national data include the name(s), value(s), and shipment volume of all USDA Foods commodities and the value only of USDA DoD Fresh fruits and vegetables obtained with USDA Foods entitlement funds. For purposes of analysis, commodities listed in the USDA Budget Explanatory Notes were assigned to separate food groups that included dairy (more than 90 percent was cheese), red meat, poultry, fruits, vegetables, legumes, and staples—including grains, oils, nut spreads, and other food items not included elsewhere. Additionally, we identify types of vegetables as dark green, other, red/orange, and starchy because USDA school meal nutrition standards give recommendations for vegetables classified in this manner. Fruits and vegetables were also categorized as canned, fresh, or frozen and as low- or no-salt added, in extra-light syrup or water, and single-serve or bulk. Cheese was classified as low-salt and reduced-fat. The USDA Budget Explanatory Notes for USDA, FNS also gives expenditures for all food obtained with entitlement funds from USDA DoD Fresh but do not specify those foods by type.

Changes in the Value of USDA Foods Using Entitlement Dollars

Data from the Budget Explanatory Notes indicate the total value of USDA Foods supplied to the school meals program increased nearly 45 percent, from \$933 million to nearly \$1.36 billion during 2006–17 in 2003 dollars. In 2006, cheese, poultry, and red meat accounted for nearly 71 percent of all USDA Foods entitlement funds expenditures. Figure 1 shows that purchasing of cheese, red meat, and poultry varied from 4 percent above to about 9 percent below the 2006 level with no discernible trend until 2013, and then descended to about 10 percent below the 2006 level by 2017, reaching about 60 percent of entitlement funds. The percentage of entitlement funds used to obtain fruits and vegetables from USDA DoD Fresh, on the other hand, increased at a sharper rate, rising from 5.3 percent in 2006 to 6 percent in 2012, and by 2017, to 14.9 percent, almost triple what it had been in 2006. Fruit from USDA Foods also rose substantially, rising from 9 percent in 2012 to 15 percent of USDA Foods entitlement funds expenditures in 2017. Figure 1 also shows that expenditures for vegetables held steady. Table A.1 in the appendix has the precise percentages per food category and provides the percent of cheese, poultry, and red meat for all years.

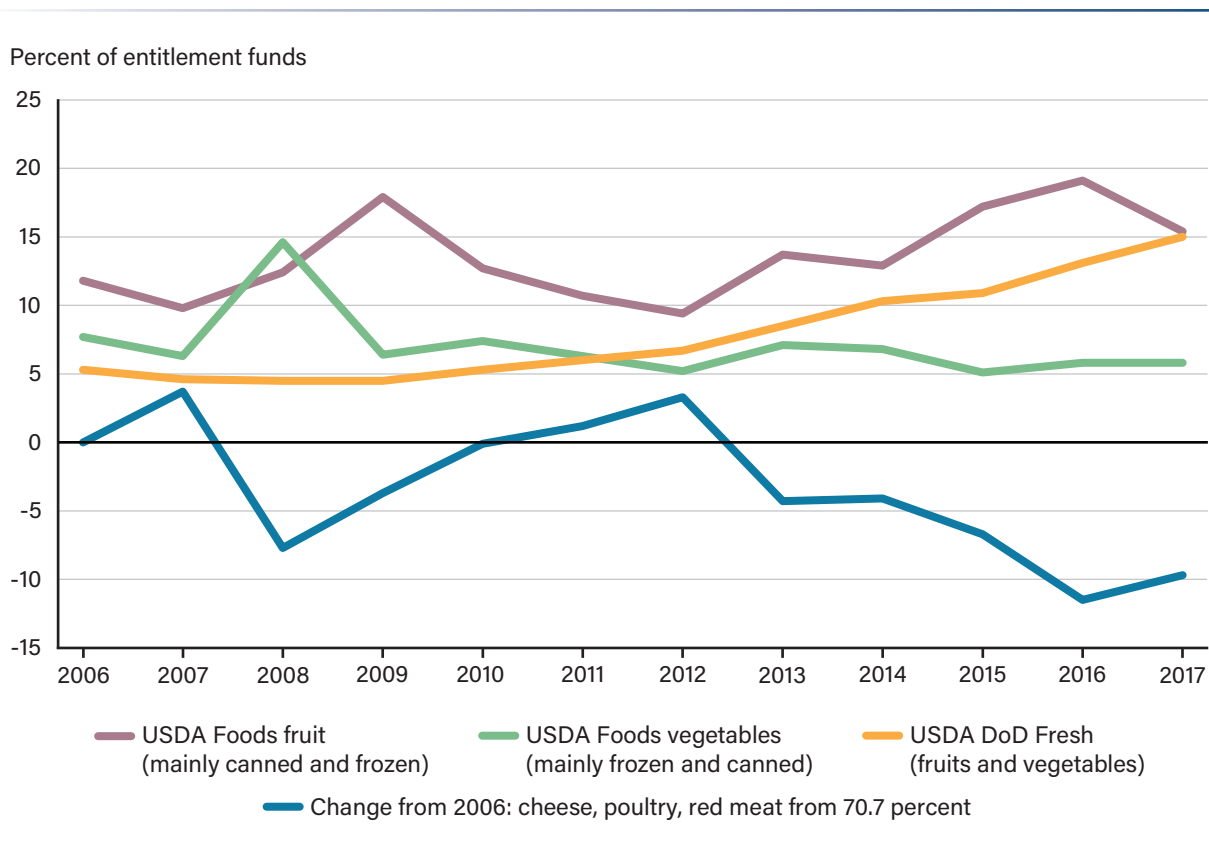
Table 2 puts the data into a statistical context. It includes a means test comparing mean values for food categories for the period before the revision to the nutrition standards in 2012 (column 1) to the mean values for food categories for the period after 2011 (column 2). The change across the 2 time periods—before 2012 and after 2011—is provided in column 3. Table 2 also provides trend values (column 4), which is the variable of

¹⁰ According to the National Center for Education Statistics, there were 18,328 school districts in the United States in school year 2015–16. SFAs generally serve one district but some may serve more than one district.

interest (in the item column), regressed on the number of years for which data are available (2005). Column 5 lists the R^2 value (explained in table 2) for the regression, and column 6 lists the number of observations. There are very few observations; thus, the values are for discussion only.

The means test shown in table 2 indicates that changes in USDA DoD Fresh were significant, rising about 5.7 percent after the change in nutrition standards; the trend variable is also significant, suggesting that USDA DoD Fresh rose nearly 1 percent (0.934). The means test for USDA Foods fruits and vegetables and cheese, meat, and poultry show insignificant rises and declines. The trends are significant and positive for fruit from USDA Foods, rising 0.467 percent per year—whereas trends are significant and negative for cheese, dropping 0.90 percent per year.¹¹ By 2017, the percent of fruits and vegetables (all fresh) from USDA DoD Fresh were about the same as fruits (mostly canned and frozen) from USDA Foods. Moreover, the combined total of fruits and vegetables from USDA DoD Fresh and USDA Foods were about 50 percent higher than in 2012. Combined, these changes are consistent with the revised nutrition standards (USDA, FNS 7, 2012) and the call for the use of more fruits and vegetables.

Figure 1
Percent of USDA Foods entitlement funds per food class, fiscal years 2006–2017¹



¹ Grains, legumes, staples, and other foods account for the residual amount, usually less than 10 percent of entitlement funds and are not included in the figure.

Source: USDA, Economic Research Service estimates are based on data from USDA Budget Explanatory Notes to the USDA Budget Summaries submitted during fiscal years 2008–19.

¹¹ Trends were determined from a regression of the percent of the food group on the year. Negative R^2 are possible in poorly specified regressions.

Table 2

Trends in the data and changes in percentages of USDA DoD Fresh and selected USDA Foods food categories, and the use of USDA Foods entitlement funds before and after revisions to nutrition standards

Reference (units)	Item	Mean before 2012	Mean after 2011	Change across periods	Trends over time	R ²	Observations
		(1)	(2)	(3)	(4)	(5)	(6)
		Percent			Percent change per year		Number
Figure 1 (percent)	USDA Foods Fruit	12.55	14.62	2.07	0.467* (0.236)	.21	11
Figure 1 (percent)	USDA Foods Vegetable	8.12	5.97	-2.15	-0.321 (0.196)	.13	12
Figure 1 (percent)	USDA DoD Fresh	5.03	10.75	5.72***	.934*** (0.119)	.85	12
Figure 1 (percent)	Cheese, red meat, poultry	69.6	65.2	-4.40	-.009** (0.003)	.33	12
Figure 2 (percent)	Single-serve fruits	6.87	34.97	28.1***	4.11*** (0.630)	.79	12
Figure 3 (percent)	Starchy vegetables	52.2	45.3	-6.9	-1.09 (0.78)	.08	12
Figure 3 (percent)	Dark green vegetables	0.00	14.78	NA	1.820 (1.05)	.33	5
Figure 3 (percent)	Other vegetables	22.0	13.5	-8.5	-1.24 (1.03)	.04	12
Figure 3 (percent)	Red/orange vegetables	25.78	28.88	3.10	0.415 (0.47)	-.02	12
Figure 4 (percent)	Low-fat cheese, not mozzarella	7.20	13.1	5.9***	0.841*** (0.240)	.11	12
Figure 4 (percent)	Low-fat mozzarella and other low-fat cheese	13.8	57.5	43.7***	6.085*** (1.028)	.76	12
Figure 5 (percent)	Whole grains	17.0	63.5	46.5***	7.2*** (0.81)	.87	12

* = 90 percent significant

** = 95 percent significant

*** = 99 percent significant

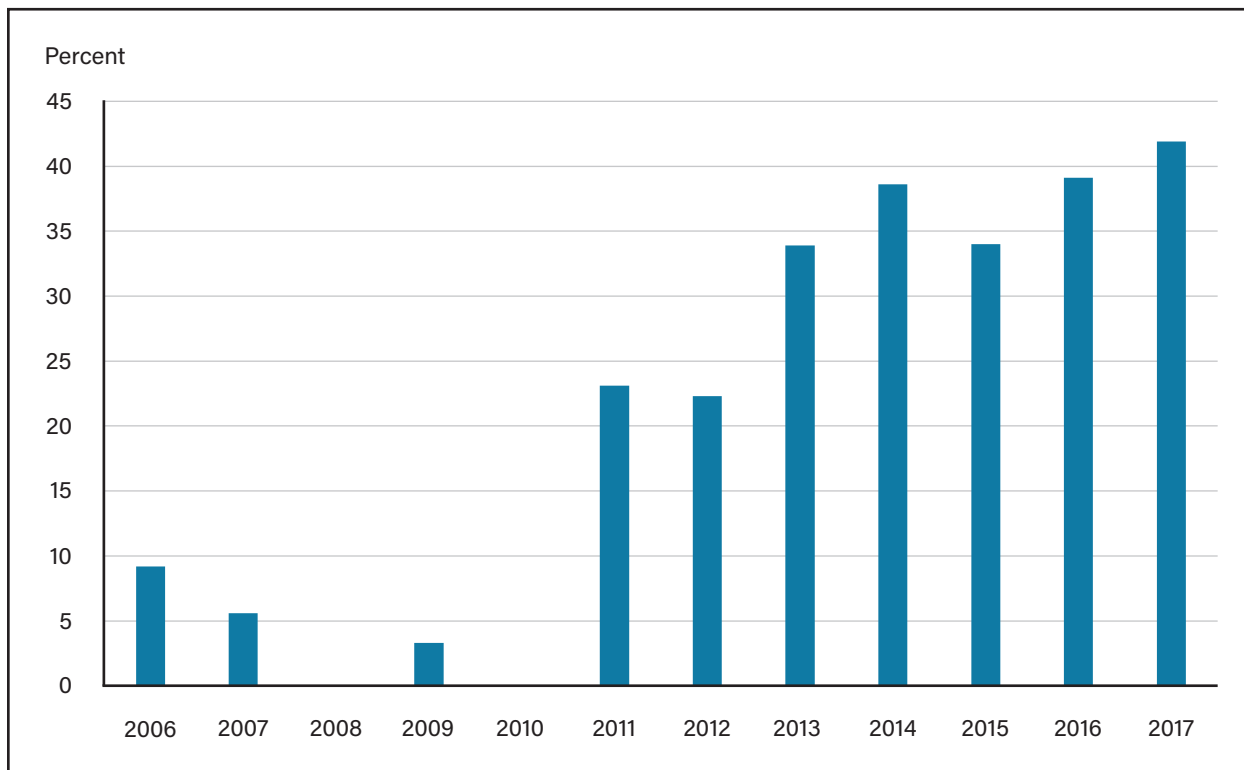
NA = not available

R² = R-squared, a measure of goodness of fit that is given as percent of variation of the dependent variable (item) that is explained by the trend.

Source: USDA, Economic Research Service estimates using information from the USDA Budget Explanatory Notes, fiscal years 2008-19.

Increases in the use of entitlement funds to obtain USDA DoD Fresh and USDA Foods fruits and vegetables may have been encouraged by the revised nutrition standards. Convenient fruit products, such as single-serve fruit cups, offered by USDA Foods that met nutrition standards proved to be particularly popular. Figure 2 shows that single-serve fruit was never more than 10 percent of fruit by value before 2011, but by 2017, those products accounted for nearly 42 percent of all USDA Foods fruit by value. The means test in table 2 indicates the changes were significant after the change in nutrition standards. The trend (4.1-percent increase per year) was also significant.

Figure 2
Percent of fruit purchased as single serve, fiscal years 2006-17¹



¹ There were no reported orders for single-serve fruit in 2008 and 2010.

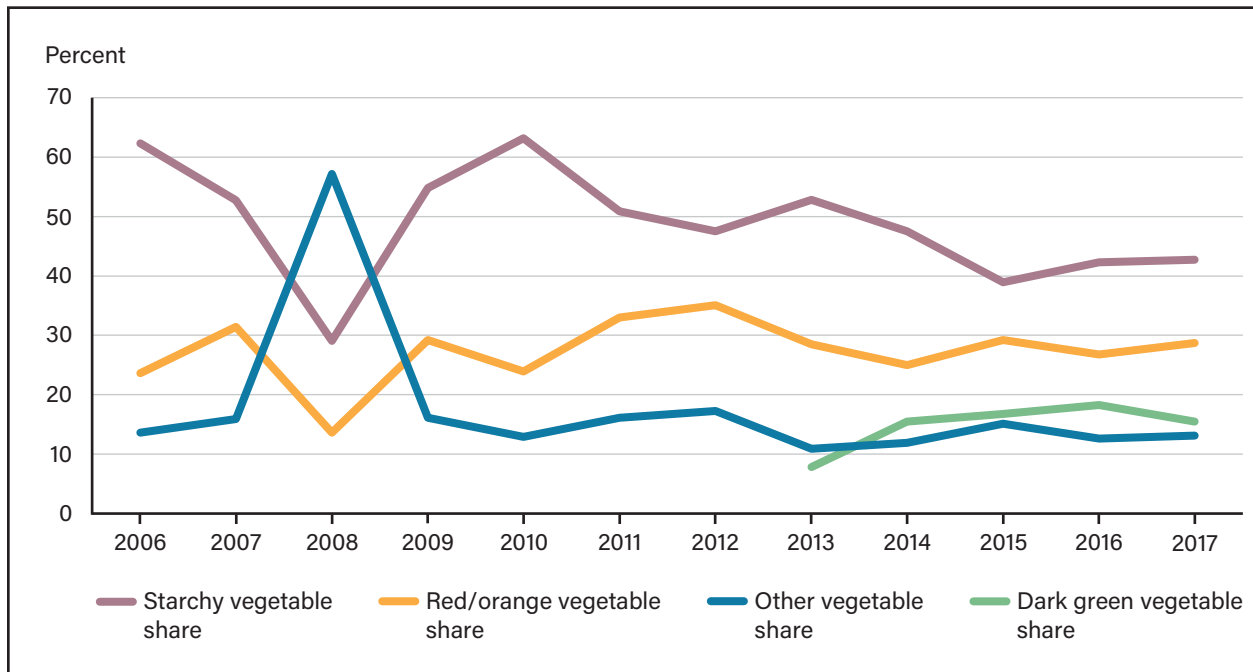
Source: USDA, Economic Research Service estimates using information from the USDA Budget Explanatory Notes, fiscal years 2008-19.

The updated standards of 2012 called for more variety in vegetables with weekly requirements for red/orange, dark green, other, and starchy vegetables. Figure 3 and table A.2 show that in 2012, school food authorities (SFAs) did not obtain any dark green vegetables, but this changed when FNS added spinach and broccoli to the USDA Foods Available List in 2013. Schools responded immediately by using entitlement funds to make dark green vegetables 8 percent of their USDA Foods vegetables by value in 2013 and 16–18 percent of their USDA Foods vegetables by value thereafter.¹² This increase in dark green vegetables came largely at the expense of starchy vegetables, such as french-fried potatoes, which dropped from 52 percent of the value of all vegetables during FYs 2006–11 to 45 percent during FYs 2012–17; the percentage of tomatoes and other red/orange vegetables rose from 26 to 29 percent, while green beans and other vegetables declined from 22 to 13.5 percent. The means test indicates there were no significant changes in means after the change in nutrition standards, and the trend analysis shows insignificant trends across the four vegetable subgroups (table 2). The vegetables include only those from the USDA Foods Available List and not those from USDA DoD Fresh.

¹² Schools also may have obtained fresh dark green vegetables (with entitlement funds) through the USDA DoD Fresh program. We do not have individual product use from that program.

Figure 3

USDA Foods vegetable subgroups as a percent of total USDA Foods vegetable purchases, fiscal years 2006-17



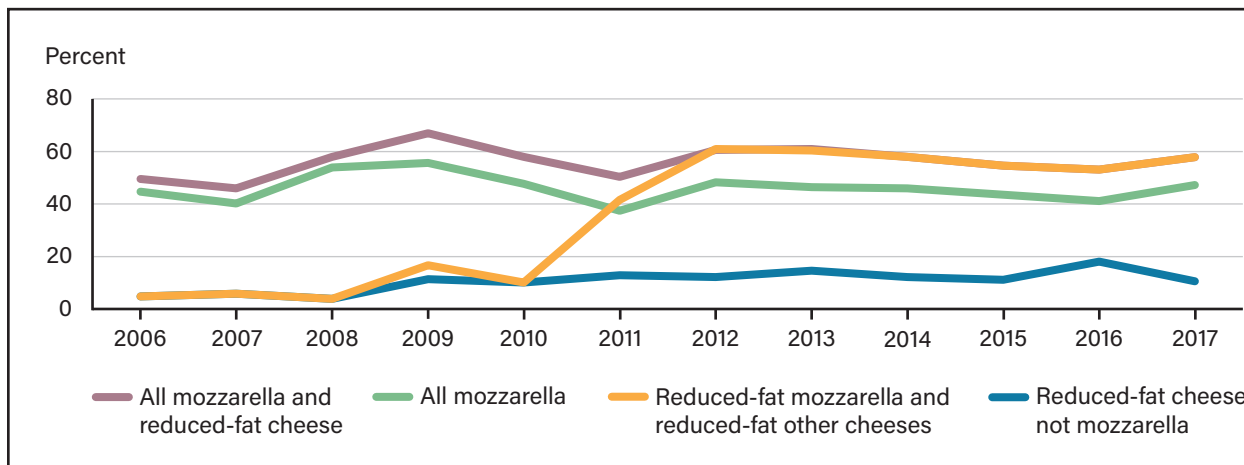
Source: USDA, Economic Research Service estimates based on data from USDA Budget Explanatory Notes to USDA Budget Summaries submitted during fiscal years 2008-19.

The revised nutrition standards set limits on sodium, calories, and saturated fats; called for the elimination of trans-fats; discouraged the use of added sugars; and demanded the regular inclusion of whole-fruit, dark green and red/orange vegetables, legumes, and whole grains (Guthrie and Newman, 2013). The data show that FNS offered only low- or no-salt added legumes and vegetables and that use of USDA Foods entitlement funds to obtain these foods was steady. The data also show that FNS only offered canned fruit that was either packed in extra light syrup or water and frozen fruit that was either unsweetened or had specifications limiting the level of added sugar. The changes were well received, as orders for USDA Foods fruit increased.

Reduced-fat cheese was offered and obtained (with entitlement funds) before 2011. Figure 4 shows the value of reduced fat cheese in entitlement funds ranged from 4 to 10 percent of USDA Foods cheese before 2011 and ranged from 11 to 18 percent of USDA Foods cheese obtained after 2010. Combined, the categories of reduced-fat other cheeses and reduced-fat mozzarella increased sharply after 2010, reaching a high of 61 percent of the value of cheese in 2012 before stabilizing at around 60 percent. Table 2 shows a significant trend in the difference in the value of reduced-fat cheese, with or without inclusion of mozzarella, using USDA Foods entitlement funds across the change in nutrition standards. When mozzarella is included, the change is much greater. Notice the mozzarella share of cheese acquisitions did not change over time. There was, however, a dramatic change in the type of mozzarella obtained as FNS offered only low-fat mozzarella after 2010.

Figure 4

Reduced- and low-fat cheese and mozzarella cheeses as percentages of all cheese purchases, fiscal years 2006-17

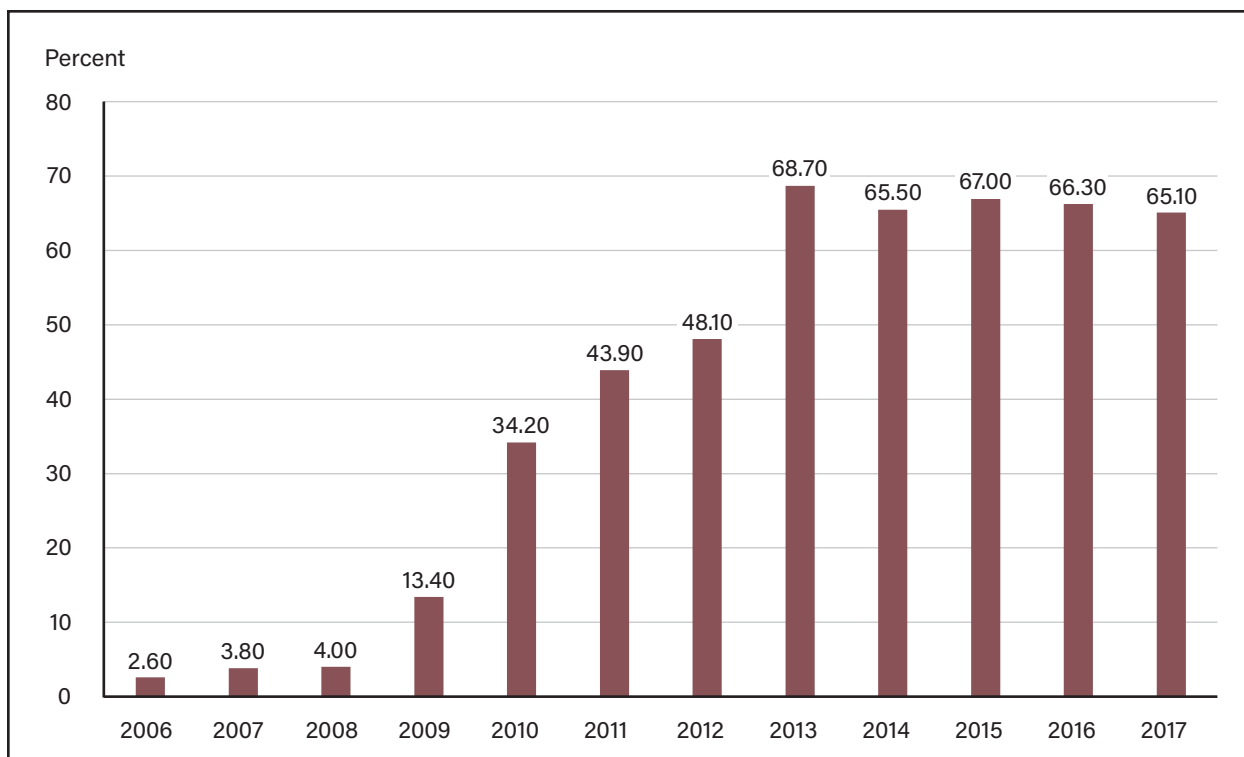


Source: USDA, Economic Research Service estimates based on data from USDA Budget Explanatory Notes in the USDA Budget Summaries submitted over the 2008-19 fiscal years.

Standing et al., 2016 indicates that SFAs reported difficulty in meeting requirements for serving whole grain-rich items. These foods were offered by USDA Foods, and (in accord with the revised nutrition standards) the share of whole grains obtained with entitlement funds increased considerably after 2011, making up more than 60 percent of USDA Foods grain by value each year beginning in 2013 (figure 5). This change was significant as was the trend of a 7.2-percent increase per year. However, SFAs relied on commercial vendors for most of their grain-based foods; thus, the change was significant, but it made only a very small impact because SFAs used USDA Foods for only a small share of their needs for grain products. Over 2012-17, for example, fewer than 20 States used more than 5 percent of USDA Foods funds to obtain whole grain foods.

Figure 5

USDA Foods whole grain purchases as a percent of all USDA Foods grain purchases, 2006-17



Source: USDA, Economic Research Service estimates based on USDA Budget Explanatory Notes in the USDA Budget Summaries submitted during fiscal years 2008-19.

Conclusion

This paper examines changes in the use of entitlement funds from USDA Foods for school meal programs over 2006–17, a period in which USDA school meal nutrition standards changed dramatically. The data show a substantial change. Standing et al. (2016) indicates that nearly 75 percent of SFAs reported changing their orders of USDA Foods so they could meet the revised standards for school year 2012–13. Examining national data, we find a shift away from the use of entitlement funds to obtain cheese, poultry, and red meat and an increase in the use of entitlement funds to obtain fruits and vegetables, especially produce from the USDA DoD Fresh program. Fresh produce obtained with entitlement funds through USDA DoD Fresh tripled between 2006 and 2017, going from 5 percent in 2006 to 15 percent in 2017. Meanwhile, the percent of USDA Foods fruits obtained with entitlement funds rose by about 33 percent, while the percent of USDA vegetables held steady over 2012–17. The increase in USDA Foods fruit obtained with entitlement funds appear to have been driven, in part, by single-serve frozen fruit cups, which accounted for more than 40 percent of the value of USDA Foods fruit.

Changes also occurred in other products. For instance, traditional offerings, such as canned vegetables, were offered in formulations that made them more compatible with revised standards. Two examples were low-salt canned vegetables and fruits packed in extra-light syrup. New products were introduced such as frozen broccoli and spinach and frozen fruit cups. These foods met nutritional standards and helped offset the cost of school meals.

Logan et al. (2019) indicates that more than 90 percent of SFAs met school lunch menu dark green, red/orange, other, and starchy vegetable standards in school year 2013–14. The evidence presented here suggests that USDA Foods helped them meet those standards. However, SFAs reported difficulty meeting requirements for serving whole grain-rich items.¹³ These foods were offered by USDA Foods, but uptake was low—fewer than 20 States used more than \$0.01 share in entitlement funds to obtain whole grain foods over 2012–17. More investigation of how to encourage use of whole grain-rich products may be helpful.

¹³ USDA relaxed the whole-grain standard to a requirement that half of all grains served weekly had to be whole-grain rich. The original regulation required all grains be whole-grain rich by school year 2014–15.

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Appendix

Table A.1

Percent of USDA Foods Entitlement Funds use per food class: 2006-17 (values support figure 1)

Year	Cheese, poultry, red meat	Change: Cheese, poultry, red meat from 2006	USDA Foods Fruit ¹	USDA Foods Vegetables ¹	USDA DoD Fresh ²
	Percent-of all USDA foods by value				
2006	70.7	0	11.8	7.7	5.3
2007	74.4	3.7	9.8	6.3	4.6
2008	63.0	-7.7	12.4	14.6	4.5
2009	67.0	-3.7	17.9	6.4	4.5
2010	70.6	-0.1	12.7	7.4	5.3
2011	71.9	1.2	10.7	6.3	6
2012	74.0	3.3	9.4	5.2	6.7
2013	66.4	-4.3	13.7	7.1	8.5
2014	66.6	-4.1	12.9	6.8	10.3
2015	64.0	-6.7	17.2	5.1	10.9
2016	59.2	-11.5	19.1	5.8	13.1
2017	61.0	-9.7	15.4	5.8	15

¹ USDA Foods fruit and vegetables are mainly either frozen or canned.

² USDA DoD Fresh fruits and vegetables are fresh.

Source: USDA, Economic Research Service estimates based on data from explanatory notes to the USDA Budgets submitted over the 2008-19 years.

Table A.2

USDA Foods vegetable subgroups as a percent of total USDA Foods vegetable obtained using entitlement funds: 2006-17 (values support figure 2)

Year	Starchy	Red/Orange	Dark green	Other
	Percent of all USDA Foods vegetables by value			
2006	62.3	23.6	Not offered	14.1
2007	52.7	31.4	Not offered	15.9
2008	29.1	13.6	Not offered	57.3
2009	54.8	29.2	Not offered	16.0
2010	63.2	23.9	Not offered	12.9
2011	50.9	33.0	Not offered	16.1
2012	47.5	35.1	Not offered	17.4
2013	52.8	28.5	7.8	10.9
2014	47.5	25.0	15.5	12.0
2015	38.9	29.2	16.8	15.1
2016	42.3	26.8	18.3	12.6
2017	42.7	28.7	15.5	13.1

Source: USDA, Economic Research Service estimates based on data from explanatory notes to the USDA Budgets submitted over the 2008-19 years.