Regulatory Impact Analysis

Title: **Nutrition Standards in the National School Lunch and School Breakfast Programs**

Action

a. Nature: Final Rule

b. Need: Section 103 of the Child Nutrition and WIC Reauthorization Act of 2004 inserted Section 9(a)(4) into the National School Lunch Act requiring the Secretary to promulgate rules revising nutrition requirements, based on the most recent Dietary Guidelines for Americans, that reflect specific recommendations, expressed in serving recommendations, for increased consumption of foods and food ingredients offered in school nutrition. This final rule amends Sections 210 and 220 of the regulations that govern the National School Lunch Program (NSLP) and the School Breakfast Program (SBP). The rule implements many of the recommendations of the National Academies' Institute of Medicine (IOM). Under contract to the United States Department of Agriculture (USDA), IOM proposed changes to NSLP and SBP meal pattern requirements consistent with the 2005 Dietary Guidelines and IOM's Dietary Reference Intakes. The final rule advances the mission of the Food and Nutrition Service (FNS) to provide children access to food, a healthful diet, and nutrition education in a manner that promotes American agriculture and inspires public confidence.

c. Affected Parties: The programs affected by this rule are the NSLP and the SBP. The parties affected by this regulation are USDA's Food and Nutrition Service, State education agencies, local school food authorities, schools, students, and the food production, distribution and service industry.

This impact analysis does not reflect changes for expected language in appropriations legislation addressing limits on vegetables in school meals programs.

Contents

Abbreviations

The following abbreviations are used throughout this document:

CN	Child Nutrition Programs
CPI	Consumer Price Index
CRE	Coordinated Review Effort
DRI	Dietary Reference Intake
FNS	Food and Nutrition Service
FY	Fiscal Year
IOM	Institute of Medicine
NSLA	National School Lunch Act
NSLP	National School Lunch Program
RDA	Recommended Dietary Allowance
SA	State Agency
SBP	School Breakfast Program
SY	School Year
SFA	School Food Authority
SLBCS-II	School Lunch and Breakfast Cost Study II
SMI	USDA School Meals Initiative for Healthy Children
SNDA-III	School Nutrition Dietary Assessment III
USDA	United States Department of Agriculture

I. Background

The National School Lunch Program (NSLP) is available to over 50 million children each school day; an average of 31.7 million children per day ate a reimbursable lunch in fiscal year (FY) 2010. The School Breakfast Program (SBP) served an average of 11.7 million children daily. Schools that participate in the NSLP and SBP receive Federal reimbursement and USDA Foods (donated commodities) for lunches and breakfasts that meet program requirements. In exchange for this assistance schools serve meals at no cost or at reduced price to income-eligible children. Federal meal reimbursements and USDA Foods totaled $13.7 billion in FY 2010. FNS projections of the number of meals served and Federal program costs are summarized in Table 1.[1]

Table 1: Projected Number of Meals Served and Total Federal Program Costs (in millions)

	Fiscal Year					
	2011	**2012**	**2013**	**2014**	**2015**	**2016**
NSLP						
Lunches Served	5,386.7	5,465.3	5,530.9	5,586.2	5,630.9	5,675.9
Program Cost	$11,822.8	$12,373.0	$12,499.8	$12,584.9	$12,679.3	$12,782.4
SBP						
Breakfasts Served	2,090.9	2,187.0	2,252.7	2,297.7	2,332.2	2,367.2
Program Cost	$3,115.3	$3,337.7	$3,469.8	$3,556.7	$3,628.6	$3,721.0

In FY 2010, schools served 2.9 billion free NSLP lunches, 0.5 billion reduced price lunches, and 1.8 billion full price or "paid" lunches. Schools served 1.5 billion free breakfasts, 0.2 billion reduced price breakfasts, and 0.3 billion paid breakfasts. These figures do not include non-Federally reimbursable à la carte meals or other non-program foods.[2]

Reimbursement rates for meals served under the current meal patterns are established by law and are adjusted annually for inflation. For school year (SY) 2011-2012, the Federal reimbursement for a free breakfast for schools in the contiguous United States and "not in severe need" is $1.51; the Federal reimbursement for a free lunch to schools in SFAs in the contiguous United States that served fewer than 60 percent free and reduced price lunches was $2.77. Schools that participate in the NSLP also receive USDA Foods for each free, reduced price, and paid lunch served, as provided by Section 6 of the Richard B. Russell National School Lunch Act (NSLA). Table 2 provides a breakdown of breakfast and lunch reimbursements in SY 2011-2012, including USDA Foods.

[1] The figures in Table 1 are USDA projections of the number of program meals served and the value of USDA reimbursements for those meals. These figures are baseline Federal government costs of the NSLP and the SBP estimated for the President's budget proposal for FY 2012. Elsewhere in this document, baseline costs refer to the cost to schools of serving meals that satisfy current program requirements.

[2] USDA program data

Table 2: Federal Per-Meal Reimbursement and Minimum Value of USDA Foods, SY 2011-2012[3]

	Breakfast Reimbursement		Lunch Reimbursement		Minimum Value of Donated Foods
	Schools in "Severe Need"	Schools not in "Severe Need"	SFAs that serve at least 60% of lunches free or at reduced price	SFAs that serve fewer than 60% of lunches free or at reduced price	Additional Federal assistance for each NSLP lunch served
Contiguous States					
Free	$1.80	$1.51	$2.79	$2.77	$0.2225
Reduced Price	1.50	1.21	2.39	2.37	0.2225
Paid	0.27	0.27	0.28	0.26	0.2225
Alaska					
Free	$2.88	$2.41	$4.52	$4.50	$0.2225
Reduced Price	2.58	2.11	4.12	4.10	0.2225
Paid	0.40	0.40	0.45	0.43	0.2225
Hawaii					
Free	$2.10	$1.76	$3.27	$3.25	$0.2225
Reduced Price	1.80	1.46	2.87	2.85	0.2225
Paid	0.30	0.30	0.33	0.31	0.2225

Under Section 9(a)(4) and Section 9(f)(1) of the NSLA, schools that participate in the NSLP or SBP must offer lunches and breakfasts that are consistent with the goals of the most recent Dietary Guidelines for Americans. School lunches must provide one-third of the Recommended Dietary Allowances (RDA) for protein, calcium, iron, and vitamins A and C, on average over the course of a week; school breakfasts must satisfy one-fourth of the RDAs for the same nutrients. Current nutrition requirements for school lunches and breakfasts are based on the 1995 Dietary Guidelines and the 1989 RDAs. (School lunches and breakfasts were not updated when the 2000 Dietary Guidelines were issued because those recommendations did not require significant changes to the school meal patterns.) The 2005 and 2010 Dietary Guidelines, provide more prescriptive and specific nutrition guidance than earlier releases, and require significant changes to school meal requirements.

The United States Department of Agriculture's Food and Nutrition Service (FNS) contracted with the National Academies' Institute of Medicine (IOM) in 2008 to examine current NSLP and SBP nutrition requirements. IOM formed an expert committee tasked with comparing current school meal requirements to the 2005 Dietary Guidelines and to current Dietary Reference Intakes. The committee released its recommendations in late 2009 (IOM 2009). For a summary discussion of the scientific standards that guided the committee, and the development of recommended targets for micro- and macronutrients, see the preamble to the proposed rule.[4]

[3] School year 2011-2012 NSLP and SBP reimbursement rates, and the minimum value of donated foods, can be found in the July 20, 2011 *Federal Register*, Vol. 76, No. 139, pp. 43256 and 43258.
[4] *Federal Register*, Vol. 76, No. 9, pp. 2494-2570.

II. Summary of Final Rule Meal Requirements

The proposed rule, published in January 2011, made only minor changes to the IOM recommendations. This final rule makes more significant changes. These changes respond primarily to comments received from school and State officials, nutrition and child advocates, industry groups, parents of schoolchildren, and the general public. Additional changes respond to recommendations contained in the 2010 Dietary Guidelines which were released after development of the proposed rule. As a group, these changes reduce program costs relative to the proposed rule. The final rule is effective at the start of SY 2012-2013.

The final rule, like the proposed rule, makes the following changes to current NSLP and SBP meal standards:

- increases the amount and variety of fruits, vegetables, and whole grains;
- sets minimum and maximum levels of calories; and
- increases the focus on reducing the amounts of saturated fat and sodium provided in school meals.

Table 3 summarizes the breakfast and lunch meal standards with all provisions fully phased in. The following provisions are subject to a phased implementation; all other provisions are effective July 1, 2012:

- minimum breakfast fruit requirement is effective July 1, 2014,
- minimum breakfast grain requirement is effective July 1, 2013,
- starchy vegetable maximum at lunch is 2 cups per week for grades K-8, and 2½ cups per week for grades 9-12 for school years beginning July 1, 2012 and July 1, 2013; the 1½ cup limit on starchy vegetables in Table 3 is effective July 1, 2014,
- intermediate sodium targets take effect on July 1, 2014 and July 1, 2017; the final sodium target (in Table 3) takes effect on July 1, 2022. (See Table 3a.)

Table 3: Summary of Final Rule Meal Requirements[5]

Meal Pattern	Breakfast Meal Pattern			Lunch Meal Pattern		
	Grades K-5[a]	Grades 6-8[a]	Grades 9-12[a]	Grades K-5	Grades 6-8	Grades 9-12
	Amount of Food[b] Per Week (Minimum Per Day)					
Fruits (cups)[c,d]	5 (1)[e]	5 (1)[e]	5 (1)[e]	2½ (½)	2½ (½)	5 (1)
Vegetables (cups)[c,d]	0	0	0	3¾ (¾)	3¾ (¾)	5 (1)
Dark green[f]	0	0	0	½	½	½
Red/Orange[f]	0	0	0	¾	¾	1¼
Beans/Peas (Legumes)[f]	0	0	0	½	½	½
Starchy[g]	0	0	0	1½	1½	1½
Other[f,h]	0	0	0	½	½	1¼
Grains (oz eq)[i]	7-10 (1)[j]	8-10 (1)[j]	9-10 (1)[j]	8-9 (1)	8-10 (1)	10-12 (2)
Meats/Meat Alternates (oz eq)	0[k]	0[k]	0[k]	8-10 (1)	9-10 (1)	10-12 (2)
Fluid milk (cups)[l]	5 (1)	5 (1)	5 (1)	5 (1)	5 (1)	5 (1)
Other Specifications: Daily Amount Based on the Average for a 5-Day Week						
Min-max calories (kcal)[m,n,o]	350-500	400-550	450-600	550-650	600-700	750-850
Saturated fat (% of total calories)[n,o]	< 10	< 10	< 10	< 10	< 10	< 10
Sodium (mg)[n, p]	≤ 430	≤ 470	≤ 500	≤ 640	≤ 710	≤ 740
Trans fat[n,o]	Nutrition label or manufacturer specifications must indicate zero grams of trans fat per serving.					

[a] In the SBP, the above age-grade groups -are required beginning July 1, 2013 (SY 2013-14). In SY 2012-2013 only, schools may continue to use the meal pattern for grades K-12, now under §220.23.

[b] Food items included in each food group and subgroup and amount equivalents. Minimum creditable serving is ⅛ cup.

[c] One quarter-cup of dried fruit counts as ½ cup of fruit; 1 cup of leafy greens counts as ½ cup of vegetables. No more than half of the fruit or vegetable offerings may be in the form of juice. All juice must be 100% full-strength.

[d] For breakfast, non-starchy vegetables may be substituted for fruits. One half-cup of non-starchy vegetables credits equivalent to ½ cup of fruits.

[e] The fruit quantity requirement for the SBP (5 cups/week or a minimum of 1 cup/day) is effective July 1, 2014 (SY 2014-2015).

[f] Larger amounts of these vegetables may be served.

[g] All schools must offer no more than 1½ cups of starchy vegetables per week beginning July 1, 2014 (SY 2014-2015). In SY 2012-2013 and SY 2013-2014, schools may offer age-grade groups K-5 and 6-8 up to 2 cups of starchy vegetables per week and offer the age-grade group 9-12 up to 2½ cups of starchy vegetables per week. Schools that choose to offer more starchy vegetables in those two years are still required to offer weekly the minimum amounts of all other vegetable subgroups.

[h] If the total weekly vegetable requirement is met, overages in Dark green, Red/orange, and Beans/Peas (Legumes) may compensate for a shortage in "Other" vegetables.

[i] At least half of the grains offered must be whole grain-rich in the NSLP beginning July 1, 2012 (SY 2012-2013), and in the SBP beginning July 1, 2013 (SY 2013-2014). Aiming for a higher proportion of whole grain-rich foods is

[5] Table taken from preamble to the final rule.

encouraged. All grains must be whole grain-rich in both the NSLP and the SBP beginning July 1, 2014 (SY 2014-15).

[j] In the SBP, the above grain ranges must be offered beginning July 1, 2013 (SY 2013-2014).

[k] There is no separate meat/meat alternate component in the SBP. Beginning July 1, 2013 (SY 2013-2014), schools may substitute 1 oz. eq. of meat/meat alternate for 1 oz. eq. of grains after the minimum daily grains requirement is met.

[l] Fluid milk must be low-fat (1 percent milk fat or less, unflavored) or fat-free (unflavored or flavored).

[m] The average daily amount of calories for a 5-day school week must be within the range (at least the minimum and no more than the maximum values).

[n] Discretionary sources of calories (solid fats and added sugars) may be added to the meal pattern if within the specifications for calories, saturated fat, trans fat, and sodium. Foods of minimal nutritional value and fluid milk with fat content greater than 1 percent milk fat are not allowed.

[o] In the SBP, calories and trans fat specifications take effect beginning July 1, 2013 (SY 2013-2014).

[p] Final sodium specifications are to be reached by SY 2022-2023 or July 1, 2022. Intermediate sodium specifications are established for SY 2014-2015 and 2017-2018. See required intermediate specifications in §210.10(f)(3) for lunches and §220.8(f)(3) for breakfasts.

Table 3a: Intermediate and Final Sodium Targets

Age/Grade Group	Sodium Reduction: Timeline & Amount		
	Target 1: July 1, 2014 (SY 2014-2015) (mg)	**Target 2: July 1, 2017 (SY 2017-2018) (mg)**	**Final Target: July 1, 2022 (SY 2022-2023) (mg)**
K-5	≤ 1,230	≤ 935	≤ 640
6-8	≤ 1,360	≤ 1,035	≤ 710
9-12	≤ 1,420	≤ 1,080	≤ 740

Key differences between current meal pattern requirements and the final rule include:

- The number of fruit and vegetable servings offered to students over the course of a week would double at breakfast and would rise substantially at lunch.
- Schools would no longer be permitted to substitute between fruits and vegetables; each has its own requirement, ensuring that students are offered both fruits and vegetables every day.
- A minimum number of vegetable servings would be required from each of four vegetable subgroups. The proposed rule included tomatoes in the "other" vegetable category, consistent with the 2005 Dietary Guidelines. The 2010 Dietary Guidelines and this final rule create a new "red/orange" group that combines tomatoes with all of the vegetables in the previous "orange" category.
- Initially, half of grains offered to students would have to be whole grain rich. Two years after implementation, all grain products offered would have to be whole grain rich.
- Schools would be required to substitute low fat and fat free milk for higher fat content milk. This is a separate requirement of the Healthy Hunger-Free Kids Act of 2010 (HHFKA). Section 202 of HHFKA requires schools to offer a variety of fluid milk consistent with the

recommendations of the most recent Dietary Guidelines for Americans. The 2010 Dietary Guidelines recommends fat free or low fat milk (1 percent milkfat) for children ages 2 and older.

Table 4: School breakfast Program – Current Requirements Compared to Final Rule Requirements for a 5-Day School Week[a]

	Current Requirements	Final Rule		
Grade Levels	K-12	K-5	6-8	9-12
Fruit (cups)	2.5	5	5	5
Vegetable (cups)	0	0	0	0
Grain/Bread (oz eq)	0-10[b,c]	7-10	8-10	9-10
Meat/Meat Alternates (oz eq)	0-10[c]	0[d]	0[d]	0[d]
Milk (cups)	5	5	5	5

[a] Requirements and recommendations are for meals as offered for a 5-day school week. Requirements are minimum portion sizes based on the Traditional Food-Based Menu Planning approach.

[b] Must be enriched or whole grain.

[c] Requirements call for two grains, two meats, or one of each

[d] Schools retain ability to substitute meat for grains. See Table 3, footnote k for additional detail.

Table 5: National School Lunch Program: Current Requirements Compared to Final Rule Requirements for a 5-Day School Week[a]

	Current Requirements: Traditional Food-Based Approach			Current Requirements: Enhanced Food-Based Approach			Final rule[e]		
Grade Levels	K-3[b]	4-12[b]	7-12[c,d]	K-3[b,d]	4-12[b]	7-12	K-5	6-8	9-12
Fruit (cups)	2.5[f]	3.75[f]	3.75[f]	3.75[f]	4.25[h]	5[f]	2.5	2.5	5
Vegetable (cups)							3.75	3.75	5
Dark Green	NS	NS	NS	NS	NS	NS	0.5	0.5	0.5
Orange	NS	NS	NS	NS	NS	NS	0.75	0.75	1.25
Legumes	NS	NS	NS	NS	NS	NS	0.5	0.5	0.5
Starchy	NS	NS	NS	NS	NS	NS	1.5	1.5	1.5
Other	NS	NS	NS	NS	NS	NS	0.5	0.5	1.25
Grain/Bread (oz eq)	8 (min 1/day)[g]	8 (min 1/day)[g]	8 (min 1/day)[g]	10 (min 1/day)[g]	12 (min 1/day)[g]	15 (min 1/day)[g]	8-9	8-10	10-12
Meat/Meat Alternates (oz eq)	7.5	10	15	7.5	10	10	8-10	9-10	10-12
Milk (cups)	5	5	5	5	5	5	5	5	5

[a] Requirements and recommendations are for meals *as offered* for a 5-day school week.

[b] Minimum portion sizes.

[c] Recommended potion sizes for the Traditional Food-Based Menu Planning approach.

[d] Optional grade configuration.

[e] See Table 3 and Table 3 footnotes for additional detail. Final rule standards shown in this table are after full phase-in (SY 2014-2015).

[f] Two or more servings of fruit, vegetables, or both a day.

[g] Must be enriched or whole grain.

[h] Two or more servings of fruit, vegetables, or both a day, plus an extra half-cup over the 5-day school week.

III. Cost/Benefit Assessment

A. Summary

1. Costs

The final rule will more closely align school meal pattern requirements with the science-based recommendations of the 2005 and 2010 Dietary Guidelines. These changes will increase the amount of fruits, vegetables, and whole grains offered to participants in the NSLP and SBP.[6] The final rule meal patterns will also limit certain fats and reduce calories and sodium in school meals. Because some foods that meet these requirements are more expensive than foods served in the school meal programs today, the food cost component of preparing and serving school meals will increase.

The biggest contributors to this increase are the costs of serving more vegetables and more fruit, and replacing refined grains with whole grains. We estimate that food costs will increase by 2.6 cents per lunch served, as compared with prior requirements, on initial implementation of the final rule requirements. There is no immediate increase in breakfast food costs. Two years after implementation, when the fruit requirement is phased in for breakfast, and when all grains served at breakfast and lunch must be whole grain rich, we estimate that food costs will increase by 5 cents per lunch served and 14 cents per breakfast, as compared with prior requirements.[7] In aggregate, we estimate that the rule may increase SFA food costs by $1.6 billion from FY 2012 through FY 2016. The annual increase in food costs relative to current standards is estimated to be about $0.6 billion by FY 2015.

The rule sets sodium targets that will not be fully implemented in the five year period covered by this analysis. The rule's initial sodium targets take effect in SY 2014-2015. Our cost estimate does not include an explicit adjustment to meet those targets. The rule's initial sodium targets

[6] Although a separate rulemaking will propose changes to the meal patterns for preschoolers, this rule makes one significant change for that age/grade group. Section 202 of the Healthy Hunger-Free Kids Act (P.L. 11-296) requires that schools offer a variety of milk, and that the milk offered comply with the recommendations of the most recent Dietary Guidelines. Consistent with that statutory requirement, this rule requires that schools serve only fat-free and low-fat milk in school lunches and breakfasts. That requirement applies to meals served by schools to children ages 3-4 as well as to older children in grades K-12. Because low-fat and fat-free milk tend to cost less than milk with higher fat content, that change will have a small negative effect on the cost of meals served to pre-K children. In addition to that change, the rule requires that schools serving meals to pre-K children adopt food-based menu planning (FBMP) for consistency with the rule's FBMP requirement for meals served to older children. Because the switch to FBMP, where necessary, makes no substantive change to the pre-K meal requirements, our analysis assumes that this provision of the rule has no impact on the cost of serving meals to these children. More than 2/3 of elementary schools used traditional or enhanced FBMP in SY 2004-2005 (USDA 2008, vol. 1, p. 36) and would need to make no changes at all to comply with the rule's pre-K menu planning requirement. For elementary schools that serve meals to pre-K children using a nutrient based menu planning system, the rule would require a change to FBMP. But that change is required for meals served to older children as well, and the administrative cost of that change is incorporated into the labor cost estimate of this analysis.

[7] The 5 cent per lunch figure is an estimate for the end of FY 2012 (the start of SY 2012-2013). The higher numbers are for FY 2015.

impose relatively modest reductions from levels observed in SY 2004-2005.[8] Our estimate assumes that schools will meet the rule's initial targets as they reformulate recipes to meet the rule's food group requirements; that cost is contained in our estimate's food group and labor components.

Compliance with this rule is likely to increase labor costs. Serving healthier school meals that are acceptable to students may require more on-site preparation, and less reliance on prepared foods. IOM did not estimate the overall required increase in labor costs to implement its recommended changes in meal requirements, but noted an analysis of data from some Minnesota school districts that showed that "healthier" meals had higher labor costs – principally because of increased use of on-site preparation[9].

For purposes of this impact analysis, labor costs are assumed to grow so that they maintain a constant ratio with food costs, consistent with findings from a national study of school lunch and breakfast meal costs (USDA 2008). In practice, this suggests that food and labor costs may increase by nearly equal amounts relative to current costs. Additional costs of compliance with the rule are discussed in subsections III C and III D of this analysis.[10]

The estimated overall costs of compliance are summarized in Table 6. For purposes of this analysis, the rule is assumed to take effect on July 1, 2012, the start of school year (SY) 2012-2013. The additional requirement to offer only whole grain rich grain products is assumed to begin in SY 2014-2015.

The analysis estimates that total costs may increase by $3.3 billion through fiscal year (FY) 2016, or roughly 8.3 percent when the rule's food group requirements are fully implemented in FY 2015. The estimated increases in food and labor costs are equivalent to about 11 cents for each reimbursable school lunch and about 28 cents for each reimbursable breakfast in FY 2015. These costs would be incurred by the local and State agencies that control school food service accounts.

Table 6: Projected Cost of Final Rule (dollars in millions)

	Fiscal Year					
	2012	**2013**	**2014**	**2015**	**2016**	**Total**
Food Costs	$21.1	$137.4	$183.0	$630.3	$661.2	**$1,633.0**
Labor Costs	21.5	147.9	178.6	615.1	645.3	**1,608.3**
State AgencyAdministrative Costs	0.1	8.9	9.1	9.4	9.7	**37.1**
Total	**$42.8**	**$294.2**	**$370.6**	**$1,254.7**	**$1,316.2**	**$3,278.5**
Percent Change Over Baseline	**2.0%**	**2.1%**	**2.5%**	**8.3%**	**8.4%**	**5.3%**

[8] USDA 2008, volume 1, pp. 162 and 196
[9] IOM 2009, p. 148.
[10] The SLBCS-II found that costs other than food and labor accounted for 9.9 percent of reported SFA costs. These costs include "supplies, contract services, capital expenditures, indirect charges by the school district, etc." (USDA 2008, pp. 3-5)

2. Benefits

The primary benefit of this rule is to align the regulations with the requirements placed on schools under NSLA to ensure that meals are consistent with the goals of the most recent Dietary Guidelines and the Dietary Reference Intakes. In increasing access to children for such meals it will address key inconsistencies between the diets of school children and Dietary Guidelines by 1) increasing servings of fruits and vegetables, 2) replacing refined-grain foods with whole-grain rich foods, and 3) replacing higher-fat dairy products with low-fat varieties. It also results in a number of additional benefits, including alignment between Federal program benefits and national nutrition policy, improved confidence by parents and families in the nutritional quality of school meals, and the contribution that improved school meals can make to the overall school nutrition environment.

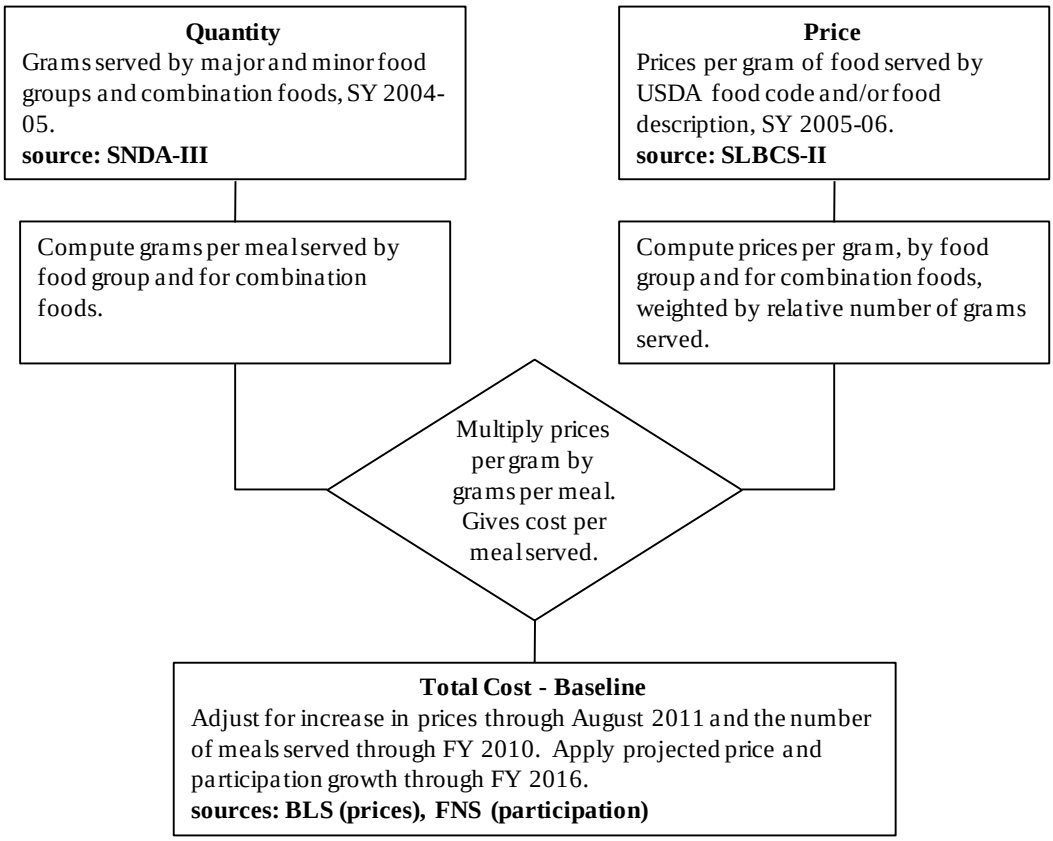
B. Food and Labor Costs

1. Baseline Cost Estimate

Food Costs: The analysis begins with an assessment of the cost of purchasing food to meet the rule's food-based meal requirements. The estimated increase in food cost is the difference between the cost of serving the quantities and types of foods used to meet current requirements and the cost of serving the quantities and types of foods outlined in the rule.

Figure 1: Baseline Food Cost Estimate under Current Requirements and Practices

Objective: Use price and quantity data collected from schools to compute the total cost of NSLP and SBP meals served under current program rules.



The data sources that we use in this analysis, and their contribution to our food cost estimate, are summarized in Table 7.

Table 7: Summary of Food Cost Estimate Data Sources

Data Source	Contribution to Food Cost Estimate
School Nutrition Dietary Assessment Study III (USDA 2007)	• Food codes and descriptions and food quantities served to students in SY 2004-05. Prices are applied to these food quantities to determine baseline food costs. • Meals served, quantities served, and quantities offered ("offer weights") by food type, by school type (elementary, middle, and high). Used to determine students' inclinations to take an offered menu item ("take rates"). Take rates are applied to the types and quantities of food that must be offered to students under the rule to estimate quantities served.
School Lunch and Breakfast Cost Study II (USDA 2008)	• Food codes and descriptions, number of servings, average gram weight per serving, total grams served, cost per serving. These are used, along with other data sources, to estimate the cost per cup or ounce equivalent of each of the rule's required food types and combination entrées. • Also used to estimate the relative cost of food group subtypes: whole versus refined grain products, and the various vegetable varieties with separate serving requirements under the rule.
USDA Child Nutrition Food Labels	• USDA food labels contain information on food group crediting for child nutrition program administrators. USDA maintains a collection of food labels for thousands of commercially-prepared entrees. Food group crediting information is used to determine the cup or ounce equivalents of meat, meat alternate, grain, vegetable, and fruit that may be credited by schools for a particular entrée. • Food group crediting is used to determine how much of the rule's food group requirements are satisfied by prepared foods offered by schools, and how much remains to be met with single food or non-entrée items.
USDA, National Food Service Management Institute, Recipe Database	• The recipe database is used to supplement the information from USDA food labels. The recipe records, like the food labels, contain food group crediting information used to determine how much of the rule's food group requirements are satisfied by particular food items.
USDA Food Buying Guide	• The Food Buying Guide also contains information on food group crediting. The crediting information for various grain products is used in this estimate.

Data Source	Contribution to Food Cost Estimate
USDA, Agricultural Research Service, National Nutrient Database for Standard Reference, SR22	• The SR22 is used to supplement the other food group crediting resources listed above. SR22 information was used to estimate food credits for food items without a CN food label, or a USDA recipe. SR22 provides protein and fiber content per given volume of a particular food. That information is used to estimate the food group credits for foods that are similar, but not identical, to foods with CN labels or USDA recipe records. • SR22 data is also used to compute the proper conversion factor from grams to cups for various school foods.
USDA, Agricultural Research Service, *MyPyramid* Equivalents Database for USDA Food Codes, Version 1.0	• Used to determine the relative share of vegetables in combination foods and entrées by each of the varieties with separate serving requirements under the rule.
School Nutrition Dietary Assessment Study II (USDA 2001)	• Average food group crediting information for school salad bars is taken from SNDA-II.

We first totaled the value of food served by food group, as reported by schools in a national school nutrition assessment (SNDA-III), separately for lunch and breakfast. SNDA-III provides an estimate of the amount or quantity (in grams) of foods offered and served in the school lunch and breakfast programs for SY 2004-2005, based on a nationally representative sample of all participating public schools.[11] SNDA-III provides quantities of both minimally processed single foods (such as whole fruit, fruit juice, milk, and vegetables) and combination foods or entrees (such as beef stew, macaroni and cheese, and breakfast burritos). We summed the quantities of foods served to generate total gram weights for each single food and combination food category. We then divided these sums by SNDA-III's count of total meals served to generate average per-meal gram amounts for the same broad food categories.

We estimated the cost per gram within each food category using detailed price and quantity information collected as part of another nationally representative sample of public schools in SY 2005-2006 (SLBCS-II). SLBCS-II provides information on the number of servings, the average gram weight per serving, total grams served, and the cost per serving for a comprehensive list of single foods and combination entrees. The SLBCS-II dataset provides sufficient information to estimate weighted average prices for the same broad food categories identified in SNDA-III.

We computed preliminary per-meal baseline costs for breakfast and lunch as the product of the food quantities reported in SNDA-III and the unit prices computed from the SLBCS-II. Because the food prices available for this analysis are from SY 2005-2006, we inflated our estimates by

[11] If patterns of student selection of foods are different in private schools than they are in public schools, then the reliance on public school data alone may bias our results. However, enrollment in public schools accounts for 97 percent of total enrollment in NSLP participating schools. Public schools account for more than 98 percent of total enrollment in SBP participating schools (USDA program data). Because public schools account for such a large share of total enrollment by participating schools, we expect that any differences in selection patterns between public and private schools would have little impact on our analysis.

the actual and projected increase in prices since that time. We computed a set of food group inflators weighted by SNDA-III's relative mix of foods served by schools in SY 2004-2005. We used the Consumer Price Index (CPI-U) for the specific food items in our weighted group averages. Because the mix of foods served in school breakfasts differs from the mix served at lunch (the grain group, for example, is weighted more heavily with bread at lunch, and more heavily with cereal at breakfast) we computed two sets of food group inflators. Through August 2011, these inflators are constructed with actual CPI values.[12] For years after 2011, the food group inflators rely on historic 7-year averages.

Our proposed rule analysis computed 5-year historic averages through FY 2009. Price inflation for most major food groups in the two years since FY 2009 was lower than inflation in the 5 years ending in September 2009. For our final rule cost analysis we use a 7-year average to project future prices. This 7-year average adds the most recent 2 years of price data to the 5 years used in the proposed rule methodology. We use a 7-year average, retaining all of the 5 years used in the proposed rule methodology, to avoid giving too much weight to the reduction in price inflation observed during the most recent two years, a period of weak economic growth and consumer demand. Use of a 5-year average ending in FY 2011 would produce a lower cost estimate than the one presented here.[13]

Food group inflation factors are summarized in Table 8.

Table 8: Food Group Price Inflators[14]

	Cumulative Increase 2006 to 2011	7-year Historic Average (for years after 2011)
Lunch inflators		
Milk	12.33%	2.03%
Meat or Meat Alternate	17.54%	2.75%
Fruit Juice	19.18%	2.82%
Fruit (non-juice)	12.39%	2.82%
Vegetables	18.52%	3.97%
Refined & Whole Grains	25.16%	3.85%
Combination Foods/Entrees	15.62%	2.67%
Breakfast inflators		
Milk	12.33%	2.03%
Meat or Meat Alternate	16.52%	2.63%

[12] We used index values for the 11 months ending in August 2011 to estimate average index values for all of FY 2011.

[13] If, instead, we entirely discount the most recent two years of inflation, and instead used a 5-year average ending in FY 2009 to project future food prices, then our cost estimate would be higher. That scenario is discussed in Section F.

[14] Computed by USDA from CPI figures from the Bureau of Labor Statistics. The figures for combination foods are based on the CPI values for the Food at Home series.

Fruit Juice	19.18%	2.82%
Fruit (non-juice)	10.38%	2.66%
Vegetables	19.81%	4.83%
Refined & Whole Grains	17.39%	2.50%
Combination Foods/Entrees	15.62%	2.67%

The value of USDA Foods and the value of cash in lieu of such food donations enters into both our baseline and final rule cost estimates; we treat them as food "costs" in both estimates. This is the same approach used in the SLBCS-II to estimate the cost of preparing and serving school meals.

We assume in the analysis that the types of commodities offered to schools in future years may satisfy the food group requirements of the final rule as effectively as they do now. USDA's annual commodity purchase plan, developed by FNS in consultation with the Agricultural Marketing Service and the Farm Service Agency, is driven by school demand for particular products as well as by current prices, available funds, and the variable nature of agricultural surpluses.[15]

In large measure, USDA Foods offered to schools are already well positioned to support the final rule's requirements. In recent years USDA has purchased relatively more canned foods and meats with reduced levels of fat, sodium, and sugar for school distribution. As products such as butter and shortening have been removed from the USDA Foods available to schools, new products such as whole grain pasta have been added. The rule is likely to move school demand towards a greater emphasis on these new offerings as schools introduce new menus. We assume that the contribution of USDA Foods to the cost of preparing school meals will not change after implementation of the rule.

The final step in constructing the baseline cost estimate was to multiply the per-meal cost estimates by the projected number of breakfasts and lunches served through our 5-year forecast period. Projected growth in the number of NSLP and SBP meals served in the absence of the rule is shown in Table 9.

Table 9: Projected Baseline Growth in Reimbursable Meals Served[16]

		Fiscal Year					
		2011	**2012**	**2013**	**2014**	**2015**	**2016**
Lunches	**meals (billions)**	5.4	5.5	5.5	5.6	5.6	5.7
	percent change	2.4%	1.5%	1.2%	1.0%	0.8%	0.8%
Breakfasts	**meals (billions)**	2.1	2.2	2.3	2.3	2.3	2.4
	percent change	6.8%	4.6%	3.0%	2.0%	1.5%	1.5%

[15] For more information see http://www.commodityfoods.usda.gov/fd_purchasing.htm

[16] The projected growth above in meals served through FY 2011 reflects the difference between FNS estimates for FY 2011prepared for the 2012 President's Budget and actual meals served in FY 2010. The remaining percentages are FNS projections prepared for the FY 2012 President's Budget.

Appendix A contains a set of tables that detail the calculations described above. The appendix tables present baseline and final rule food prices, food quantities, and meals served for each year from FY 2012 through FY 2016.

Note that our baseline per-meal cost estimates are averages. They reflect the variety of meals served across all NSLP and SBP participating schools. Some schools may be much closer than others to serving meals that meet the requirements of the rule, and the costs of compliance with the rule may therefore vary at the school level. The use of an average baseline cost estimate is appropriate, however, for estimating the aggregate cost of compliance across all schools.

2. Final Rule Cost Estimate

Food Costs: Both our baseline and final rule food cost estimates rely on quantity and price information reported by schools in SNDA-III and SLBCS-II. These datasets contain detailed information on the quantity, variety, and unit prices of foods offered and served to students. Many of the records on these datasets describe single item foods that are served alone or are used in school recipes. But other records describe prepared or heat-and-serve entrees and other "combination foods." As described above, we developed our baseline cost estimate by multiplying the gram weight of food items served by their cost per gram. For both single item foods and combination foods, prices and quantities are given in SLBCS-II and SNDA-III; our baseline cost estimate required limited processing of these datasets.

For the final rule cost estimate we continue to rely on prices per gram from SLBCS-II. But for quantities served we need to look to the requirements of the rule rather than to SNDA-III. We use the midpoints of the rule's food group requirements, expressed in servings rather than grams, to estimate the quantities of food that schools must purchase.[17] For single foods, the number of program-creditable food group servings per gram is a function of the foods themselves (density and fat content, for example) and whether the foods (primarily vegetables) are served raw or cooked. We relied on several sources for this information, including the USDA Food Buying Guide and the National Nutrient Database for Standard Reference. For combination foods we relied on the USDA's child nutrition food labels and the USDA's recipe database; these sources contain the result of analyses performed by food manufacturers and USDA. Because the sources for program-creditable servings per gram are different for single foods and combination foods, we need to separate single foods from combination foods and estimate their costs separately.

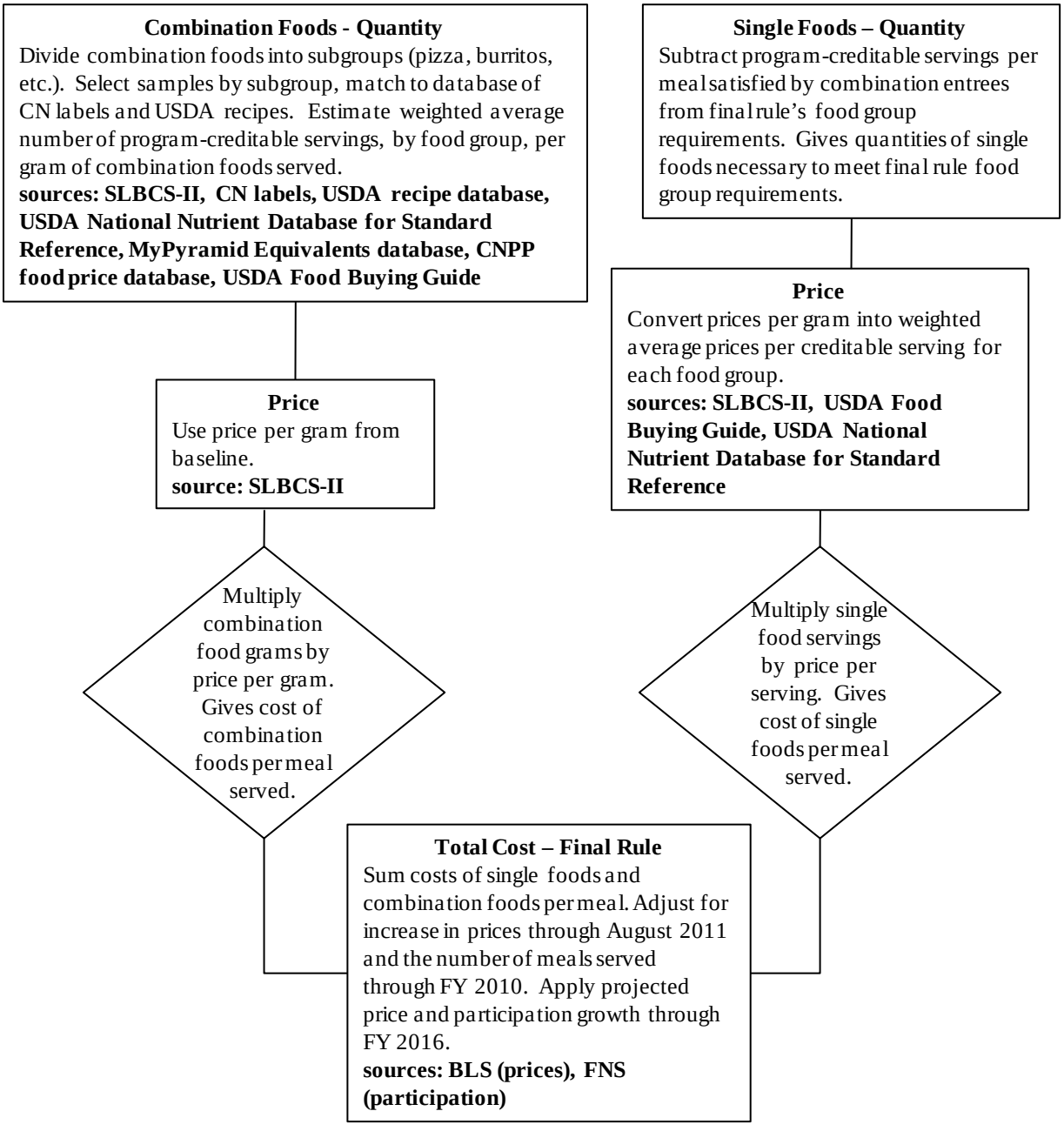
A basic assumption underlying the estimated cost of reimbursable meals under the final rule is that schools will continue to serve entrees that have proven popular with students on current school menus. Some of these entrees may be modified to replace a portion of their refined grains with whole grains, or starchy vegetables with other vegetable varieties. But, because pizza,

[17] The rule's food group requirements are expressed in servings per week. Because we are developing an average cost per meal we divide these weekly figures by 5. Some of the rule's requirements are given in ranges of servings, such as 10-12 meat or meat alternate servings (for lunches) per high school child per week (see Table 3). FNS's primary cost estimate targets the midpoints of the rule's food group requirements where requirements are expressed as ranges.

burritos, and salad bars are successful items today, this impact analysis assumes that they will remain on school menus after implementation of the rule.

Figure 2: Food Costs under Final Rule

Objective: Use price data collected from schools and new meal pattern requirements to estimate the cost of serving meals under the final rule.



We separated combination foods from single food items in the SNDA-III and SLBCS-II datasets.[18] Using USDA food codes and the descriptive food labels found on the records of both datasets, we divided the combination foods into sub-categories such as chili, beef dishes, lasagna, chicken sandwiches, macaroni and cheese, and peanut butter and jelly. Recognizing that there is variation within these groups, we selected a sample of the most commonly served varieties, and retrieved paper food labels with matching USDA food codes from USDA's Child Nutrition food label collection (CN labels).

CN labels are affixed to many of the commercially prepared and processed foods purchased by school food authorities. The labels provide information on serving size and the number of cup and ounce equivalents of meat, meat alternate (such as cheese, eggs, legumes, or soy protein), grains, or vegetables that schools may credit toward current reimbursable meal pattern requirements.[19] We averaged the crediting information for several varieties within each combination food category to generate representative food credits for the category.

CN labels are not available for some combination foods. However, foods with similar descriptions are often found in USDA's recipe database. The USDA recipe database provides the same type of food crediting information found on CN labels. We used the crediting information from the recipe database when CN labels were unavailable for sampled combination foods. FNS averaged the crediting information from labels and recipes when both sources returned data for particular combination foods.

CN labels and USDA recipes do not indicate whether creditable grain servings are refined or whole grains, nor do they specify what fraction of creditable vegetable servings are satisfied by dark green, deep yellow, starchy, or other varieties. But, USDA's *MyPyramid* database breaks down total grain and vegetable content for given foods into those subcategories or varieties. We matched USDA food codes for the sample of combination foods against the *MyPyramid* database in order to estimate relative shares of whole and refined grains, and vegetable varieties for the combination foods served.[20]

With these average food credits, and with unit prices from the SLBCS-II, we estimated a price per creditable ounce or cup equivalent of meat, grain, vegetable, and fruit for each combination food served. We then computed a weighted average price per food credit for combination foods as a whole, using the SLBCS-II's relative gram weight of each item. Finally, we multiplied the average price and food credit per gram by SNDA-III's total gram weight of combination foods served per reimbursable meal at the elementary, middle, and high school levels.

These steps generate a price, and a set of food group credits, contributed by combination foods to the average elementary, middle, and high school lunch and breakfast.

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[18] As with the baseline estimate, we prepared separate estimates of meals served under the final rule for breakfast and lunch.

[19] Many large commercial food vendors prepare their own CN labels to help market their foods to SFAs. Other labels are developed by USDA.

[20] Because CN crediting values and *MyPyramid* equivalents are not the same, information from the *MyPyramid* database was used only to determine relative shares of vegetable or grain subtypes. FNS also used the *MyPyramid* database to determine if particular combination foods contained any dark green vegetables, orange vegetables, etc.

We subtracted the food credits accrued by combination foods from a set of school-level food group targets that represent the requirements of the rule after adjustment for student selection. Under the final rule, as under current program rules, students need not take all of the food items offered to them in order for their lunch or breakfast to qualify for Federal reimbursement. The difference between what is offered to students and what they select is the "take rate." We computed average take rates by school level for milk, meat / meat alternate, fruit, vegetables, and grains from SNDA-III and applied those rates, unchanged, to the final rule's food group requirements from Tables 4 and 5.[21] These adjusted requirements are estimates of what elementary, middle, and high schools are likely to serve to students after implementation of the rule. The unadjusted requirements are what schools must offer to their students to be in compliance.

The take-rate adjusted requirements not satisfied by combination foods must be met with single offerings of meat or meat alternates, grains, fruit, vegetables, and milk. We computed weighted average prices for these broad food groups, and for dark green, deep yellow and other vegetable varieties, from the SLBCS-II dataset. We estimated the cost of whole grains relative to all grain and bread products with information contained in a food price database developed by USDA's Center for Nutrition Policy and Promotion. The prices per unit of these foods, multiplied by the balance of the rule's requirements that are not met by combination foods, give a total cost per meal for single item foods.

Note that this analytic framework uses an identical set of combination foods in the baseline and final rule cost estimates; we do not attempt to construct a reformulated set of combination foods to satisfy the rule's requirements for whole grains or dark green, yellow, and other vegetable varieties. The deficits in whole grains and in dark green and other vegetable varieties are satisfied entirely through increased offerings of single foods.[22] As a result, the cost per unit of combination foods served is unchanged in the baseline and under the final rule, and the entire cost of meeting the new rule's requirements is reflected in the cost of single foods.

In practice, we expect manufacturers will offer reformulated versions of popular combination foods, and that schools will incorporate more whole grains and vegetable varieties in their entree recipes, so that students will not be expected to consume all of their whole grains and healthier vegetables as single foods. Implicit in this modeling approach is the assumption that the cost of serving more whole grains and vegetable varieties is similar, whether those foods are part of combination recipes or single items. The reasoning behind this assumption is that the likely effect of these reformulations on the cost of combination foods is uncertain. While some varieties of combination foods may help schools meet the new requirements at lower cost than single foods, others may be developed to provide greater student acceptance or ease of preparation than single items. These products could command higher prices. We thus assume

[21] Our take rates are weighted averages computed from all school level records on SNDA-III. SNDA data allows the computation of take rates for single food items and combination entrees. We use estimates of the component foods contained in combination entrees to estimate overall take rates for each of the final rule's food groups, whether those foods are served separately or as part of a combination entrée. We cap individual school take rates for any food group at 100%. We assume that these take rates remain unchanged after implementation of the rule for two primary reasons: lack of an evidence-based alternative, and to avoid understating the costs of the rule.

[22] The amount of refined grains in combination foods in excess of final rule requirements are offset by subtracting the value of an equivalent amount of single food refined grain products from the rule's per-meal cost.

that, on average, these two propensities combine to result in no net difference in the cost of whole grains and vegetable varieties as combination foods or as single items.[23]

The final rule requires that no more than half of the fruit requirement be met with fruit juice because juice lacks fiber and may contribute to excessive calorie consumption. Schools may therefore find it necessary to offer more whole or cut-up fruit relative to fruit juice than they offer today. For this reason, this cost estimate assumes that the rule's entire increase in the fruit group requirement will be satisfied with additional servings of whole or cut-up fruit; the estimate assumes that schools will serve no more fruit juice to students under the final rule than they serve today. As a result, there is no added cost for fruit juice in Table 11.

The methodology outlined above generates a set of per-meal cost estimates for breakfast and lunch under the requirements of the final rule. Like our baseline estimates, these are multiplied by weighted food group inflation factors, then multiplied by the projected number of meals served to generate projected aggregate costs through FY 2016.

Labor costs: Compliance with this rule is also likely to increase labor costs because of the need for more on-site preparation, and less reliance on prepared foods, than current requirements. The challenge faced by schools in reducing the sodium content of school meals, one element of both the IOM recommendations and this rule, illustrates the need for additional labor hours by school kitchen staff.

> [M]ore local food preparation and the use of a greater proportion of fresh foods and frozen vegetables could result in acceptable school meals with a lower sodium content. However, many food production kitchens are designed to heat and hold food items rather than to prepare them.[24]

In addition to the implied need for new kitchen equipment, IOM notes that "switching from heat and hold to food production requires the addition of staff. Those districts that estimate meals per labor hour (MPLH) to monitor productivity may see an unfavorable decrease in their numbers."[25]

If schools choose to prepare more meals on-site to meet new requirements, IOM sees the need for "greater managerial skill," and "more skilled labor and/or training."[26] At the same time, lesser reliance on prepared foods offers some opportunity for offsetting savings.

> An empirical analysis of data from 330 Minnesota school districts found that "healthier" meals had higher labor costs (for on-site preparation) but lower costs for processed foods (Wagner, et al., 2007). The authors call for funds to be made available for labor training and kitchen upgrades. They suggest that higher federal meal reimbursement rates may be

[23] Note that we are only referring to the incremental cost of foods above the quantities already purchased by schools (singly or in combination items), not the overall cost of all foods in the final rule's meal patterns.
[24] IOM 2009, p. 110.
[25] Ibid.
[26] IOM 2009, p. 148.

> unnecessary (under the assumption that the meals do not cost more to produce because lower food costs offset higher labor costs).[27]

The effect of the final rule's meal requirements on the mix of food and labor costs is unclear. The rule requires schools to offer relatively more foods with higher unit costs than schools now offer to their students. The rule requires, for example, that schools replace many of their refined grain foods with whole grain substitutes. Because prices for whole grain products tend to exceed the prices of similar products made with refined grains, savings from eliminating a particular refined grain product is more than offset by the cost of its whole grain counterpart. Where pre-baked whole grain foods are simply substituted for pre-baked refined grain products, or whole grain flour is substituted for refined flour in existing recipes, the added cost of serving these new foods is strictly a food cost; labor costs may not increase at all.

But the rule includes other provisions that are likely to increase both food and labor costs. One is the requirement that schools offer more vegetables, from a variety of vegetable subgroups, than schools tend to offer today. Some schools may choose to meet those targets by offering vegetables in school salad bars. It is possible that the cost of installing and maintaining a salad bar could increase the overall cost of school meal production. Similarly, to meet the rule's calorie and fat requirements, schools may find it necessary to rely less on pre-purchased entrees, and hire more central kitchen or cafeteria workers to prepare healthier meals from scratch.

SLBCS-II data show that the cost of purchasing food accounted for 45.6 percent of SFA reported costs, on average. Labor accounted for an additional 44.5 percent of reported SFA costs. The remaining 9.9 percent of reported costs are attributable to "supplies, contract services, capital expenditures, indirect charges by the school district, etc."[28] Labor costs are broadly defined in the SLBCS-II to include the costs of foodservice administrative tasks such as planning, budgeting, and management, and foodservice equipment maintenance.[29] Some of these tasks are detailed in section III.C.1. These tasks include training food preparation staff, servers, and cashiers. They also include the work of individuals who plan menus and prepare recipes.

For purposes of this analysis, we assume that the relative contributions of food and labor to the total cost of preparing reimbursable school meals will remain fixed at the levels observed in the SLBCS-II. As a result, we estimate that labor costs increase on a nearly dollar for dollar basis with estimated food costs.[30] We estimate that the rule may increase schools' food costs by about 8 percent by FY 2015. Although labor costs relative to food costs have held steady over many years,[31] this approach may overstate labor costs. We explore the potential effect of labor costs growing at a somewhat lower rate in section F.

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[27] Ibid.

[28] USDA 2008, p. 3-5

[29] USDA 2008, p. 3-9

[30] The estimates contained in this analysis assume labor costs equal to food costs multiplied by (44.5/45.6), the ratio of reported labor to food costs in the SLBCS-II.

[31] Labor costs as a share of the total costs of preparing school meals were found to be 43.8 percent in FNS's SY 1992-1993 School Lunch and Breakfast Cost Study I, and 44.5 percent in the SY 2005-2006 School Lunch and Breakfast Cost Study II (a statistically insignificant difference). Food costs as a percent of total costs grew slightly from 45.6 percent in SY 1992-1993 to 48.3 percent in SY 2005-2006. But this change, too, is statistically insignificant. USDA 2008, p. 9-2.

Food and Labor Cost Summary: Table 10 summarizes the estimated increase in food and labor costs associated with the final rule through FY 2016.[32] (The final two rows of Table 10 also include the estimated administrative costs to State agencies.) Overall, we estimate that the rule may increase the total cost of reimbursable school meals by $3.3 billion over five years; the cost of food would increase by $1.6 billion, and the cost of labor would increase by $1.6 billion. In the first year of full implementation (FY 2015),[33] the combined cost of food and labor is expected to be about 8.3 percent higher under the final rule than under existing requirements. The estimated additional cost of food for a reimbursable lunch increases from about 2.6 cents in FY 2012 to 5.6 cents in FY 2016; food costs for a reimbursable breakfast grow to 14.6 cents in FY 2016. These per meal increases roughly double – to 11.0 cents and 28.8 cents – when the estimated cost of labor is included.

[32] The new standards will take effect at the start of SY 2012-2013. Because the 2012-2013 school year begins in July 2012, there is just a small cost in Federal FY 2012. Note that these figures assume no effect on student participation. We discuss the possible effects of the rule on student participation in section III.F. We examine the effect of alternate participation assumptions in section F.

[33] Two years after implementation of the rule, in SY 2014-2015, all grains servings offered to meet meal pattern requirements must be whole grain rich. The new minimum fruit requirement at breakfast also takes effect in SY 2014-2015; this is the last of the rule's major changes to the breakfast meal patterns.

Table 10: Food and Labor Cost Summary

	Fiscal Year					
	2012	**2013**	**2014**	**2015**	**2016**	**Total**
Food Costs						
Lunch						
Total Cost (millions)	$22.1	$151.5	$180.9	$298.6	$316.1	**$969.1**
Per Meal	0.026	0.027	0.032	0.053	0.056	
Breakfast						
Total Cost (millions)	-$1.0	-$14.1	$2.1	$331.7	$345.2	**$663.9**
Per Meal	-0.003	-0.006	0.001	0.142	0.146	
Lunch + Breakfast						
Total Cost (millions)	$21.1	$137.4	$183.0	$630.3	$661.2	**$1,633.0**
Per Meal	0.018	0.018	0.023	0.079	0.082	
Food + Labor Costs						
Lunch						
Total Cost (millions)	$43.6	$299.4	$357.4	$590.1	$624.5	**$1,914.9**
Per Meal	0.051	0.054	0.064	0.105	0.110	
Breakfast						
Total Cost (millions)	-$1.0	-$14.1	$4.2	$655.3	$682.0	**$1,326.4**
Per Meal	-0.003	-0.006	0.002	0.281	0.288	
Lunch + Breakfast						
Total Cost (millions)	$42.6	$285.3	$361.6	$1,245.4	$1,306.5	**$3,241.4**
Per Meal	0.036	0.037	0.046	0.156	0.162	
Food + Labor + State Administrative Costs						
Lunch + Breakfast						
Total Cost (millions)	$42.8	$294.2	$370.6	$1,254.7	$1,316.2	**$3,278.5**
Per Meal	0.036	0.038	0.047	0.158	0.164	

3. Food Cost Drivers

Table 11 provides a breakdown in the estimated food costs of the final rule by seven broad food categories. Consistent with the Dietary Guidelines, the rule will require schools to offer more fruits, vegetables, and whole grains than they currently offer today.

Changes in school demand also impact food producers. The figures in Table 11 indicate that the economic costs and benefits of the rule may not be shared equally by producer groups.

Table 11: Estimated Food Costs by Food Category
(dollars in millions)

	Fiscal Year					
Food group	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Milk	-$4.5	-$30.0	-$30.9	-$31.8	-$32.7	**-$130.0**
Meat or Meat Alternate	-25.4	-169.0	-175.3	-181.6	-188.1	**-739.4**
Fruit Juice	0.0	0.0	0.0	0.0	0.0	**0.0**
Fruit (non-juice)	0.5	3.1	47.0	295.5	307.9	**653.9**
Vegetables	76.1	512.4	538.1	563.8	590.9	**2,281.3**
Refined Grains	-80.0	-569.6	-888.9	-1,569.2	-1,639.5	**-4,747.1**
Whole Grains	54.5	390.4	693.0	1,553.5	1,622.8	**4,314.3**
Total Cost of Rule	**$21.1**	**$137.4**	**$183.0**	**$630.3**	**$661.2**	**$1,633.0**

Milk: This impact analysis estimates that the amount of milk served to students will not change after implementation of the rule.[34] However, the rule does require schools to serve only low-fat or fat-free milk in the school meals programs.[35] Because the per-unit cost of low-fat and fat-free milk is less than the average per-unit cost of the mix of milk products now served in schools, the estimated cost of serving milk under the rule is reduced. Some comments on the proposed rule noted that schools had already made the transition to fat-free and low-fat milk, and that there would be no savings as a result of this provision. We discuss this and other comments in Section E.

Fruit Juice: The estimate assumes that schools will satisfy the rule's increased fruit requirement entirely through additional servings of whole or cut-up fruit, not fruit juice. We expect that schools will have to encourage consumption of additional whole or cut-up fruit in order to satisfy this requirement. The cost estimate assumes that the amount of fruit juice served to students will not increase above the levels assumed in the baseline estimate. As a result, the relative share of whole or cut-up fruit to fruit juice servings offered to (and taken by) students will increase after implementation of the rule.

Grains: The rule initially requires that half of grains offered to students be whole grain rich. Beginning in SY 2014-2015, the rule requires that all grains served be whole grain rich. This transition is reflected in the large changes in both the whole grain and refined grain figures between FY 2014 and FY 2016.

This analysis estimates that the total amount of grain products served will be less after implementation of the final rule than the amount served in our baseline (the per-meal amount taken by students according to SNDA-III). The effect of this net reduction in total grains served

[34] See section F. for an examination of the cost implications of altering this assumption.
[35] This provision is required by Section 202 of the HHFKA and has already taken effect. Through implementation memo SP-29 – 2011, dated April 14, 2011, schools were required to offer a variety of milk that meets Dietary Guidelines recommendations. The USDA implementation memo clarifies that schools must offer at least two fat-free or low-fat (1 percent milkfat) varieties effective with the start of SY 2011-2012. This final rule includes the additional requirement that flavored milk be offered in fat-free form only.

is reflected in figures for fiscal years 2012 to 2014, where the cost decrease for refined grains exceeds the cost increase for whole grains. Throughout the estimation period, we assume that the unit cost of whole grains exceeds the unit cost of comparable refined grain products. Despite this, the net reduction in total grain products served through FY 2014 more than offsets the increased unit cost of whole grains. After FY 2014, when the rule's 100 percent whole grain rich requirement takes effect, the added cost of serving higher priced whole grain products about equals the savings from a reduction in grains products served.

4. Comparison of FNS and IOM Cost Estimates

IOM prepared its own food cost estimate for its recommended meal pattern changes. The methodology behind that estimate is discussed in *School Meals: Building Blocks for Healthy Children* (IOM 2009). While IOM relies on SLBCS-II and SNDA-III, the same primary sources used by FNS, to estimate unit costs and baseline quantities served, its methodology differs from ours in several ways.

Perhaps the most significant difference is in the establishment of baselines. We used all records on the SNDA-III dataset to estimate baseline quantities of food served and student take rates. IOM limited its analysis to a set of six representative baseline menus selected from the SNDA-III dataset. IOM selected one 5-day lunch menu and one 5-day breakfast menu for each of three age-grade groups (elementary, middle, and high school) at random from a subset that excluded practices identified as uncommon.[36] The goal of both methodologies is to estimate a baseline food cost representative of all schools that participate in the Federal school meals programs. We have not attempted to isolate and quantify the effect of this methodological difference on our cost estimates.

Another important difference between the IOM and FNS estimates is our use of different student take rates in preparing food cost estimates for the recommended meal patterns. We computed take rates from SNDA-III and applied them, largely unchanged, to the food group serving requirements of the final rule.[37] We do not increase take rates in anticipation of greater demand for better meals, nor reduce take rates in anticipation of a decline in student acceptance of new vegetable varieties, whole grains, or low fat milk relative to the starchy vegetables, refined grains, and higher fat milk on current school menus.[38] IOM modified observed take rates from SNDA-III where the expert judgment of committee members and school meal practitioners deemed it appropriate.[39] Additional differences in FNS and IOM take rates can be attributed to IOM's use of six representative school menus in its analysis; IOM computed its take rates from those schools alone. FNS take rates are computed from all schools on the SNDA-III dataset.

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[36] IOM excluded menus that did not offer a reduced fat or fat free unflavored milk, offered only one entree, offered 15 or more entree options, offered juice drinks rather than 100% fruit juice, or offered dessert every day. IOM 2009, p. 307

[37] FNS caps individual school take rates at the food group category to 100 percent. We also attempt to include the contribution of component foods in combination entrees in our estimates of take rates for the major food groups (fruit, milk, vegetables, grains, and meat / meat alternates).

[38] As discussed elsewhere in this impact analysis, our take rate assumptions are intended to avoid understating the cost of the rule given the uncertain response of both students and school foodservice workers to the new meal pattern requirements. We test the cost implications of adopting different take rates in section F.

[39] IOM 2009, p. 136

C. Administrative Impact

1. School Food Authorities (SFA)

An initial increase in administrative staff time for training and implementation is anticipated at the SFA level. Most of these impacts will be limited to the transition to the rule's new requirements as a result of:

- training staff on the required components of reimbursable lunches and breakfasts;
- changes to menus and portion size may necessitate revisions to menus and recipes currently used by SFAs;
- changes to food purchasing and commodity food use (for example, increasing purchases for fresh fruit and vegetables, whole grain products, and lower sodium products), as well as changes in the methods of preparation of food, may be necessary for many schools;
- changes in SFA financial structure, as SFAs may need to review finances in order to determine how to deal with any cost changes associated with the rule's requirements;
- forging new relationships with local farmers to supply fresh produce appealing to the tastes of school children; and
- modifying a la carte foods and other foods at school to maintain NSLP and SBP participation rates.

The rule also increases the scope of State Agency administrative reviews of SFAs by combining the current Coordinated Review Effort (CRE) with the requirements of School Meals Initiative (SMI) reviews, and increases their frequency to once every three years. SFAs that previously held separate CREs and SMIs may experience a decrease in burden, because they will undergo just one State Agency administrative review every three years, rather than two reviews (one CRE and one SMI) every five years.

FNS expects these additional burdens on SFA staff time and budgets may be offset by other benefits. For instance, new age/grade groupings would require school districts to offer different portion sizes instead of the same portions to all ages/grades. While this could be an additional burden to some SFAs, it could also reduce plate waste with use of more appropriate age/grade groupings. Moreover, it is expected that, as food service workers gain experience and become comfortable with the new requirements, administrative efforts associated with implementation may decline. Therefore, although an initial administrative impact is anticipated, FNS does not expect any significant long-term increase in administrative burden.

2. State Agencies

State Child Nutrition Agencies (SAs) play a key role in the implementation of school meal programs through their agreements and partnership with local SFAs. FNS anticipates that SAs that administer the school meals programs will work closely with SFAs to meet the requirements of the rule, and to remove barriers that may hinder compliance.

Many changes associated with implementation of the rule may result in an increased burden and additional required level of effort from States, such as:

- **Training and technical assistance:** SAs will provide training and technical assistance to SFAs on new calorie and meal pattern requirements, age/grade groupings, and revised nutrient requirements. Moving to a single, food-based menu planning system may simplify the meal service for some schools and will likely streamline the meal planning process, but may require initial training to accomplish.

  Although SAs may meet most of this demand by modifying current training and technical assistance efforts, we recognize that SAs may incur additional costs assisting SFAs with the transition to the final rule requirements. Our cost estimate provides for an additional 80 hours per SA in each of fiscal years 2012 and 2013, for a total of $0.2 million.

- **Systems assistance:** SAs may assist SFAs with any changes in the meal planning process occurring as a result of this rule. This is included in our $0.2 million estimate for training and technical assistance.

- **Food procurement and preparation:** More fruits, vegetables, whole grains, and foods that are lower in sodium may be necessary to align meals with the new meal patterns. SAs may also review SFA contracts with food service management companies (FSMCs). We have not estimated this cost, but expect that it will be small.

- **Monitoring and compliance**: SAs will be required to conduct administrative reviews (formerly CREs and SMIs) more frequently, once every 3 years for each SFA beginning in SY 2013-2014. Nutrient analysis will be required for all SFAs and will become an additional component of each review (separate SMIs will be eliminated). Nutrient-based menus will be eliminated and only food-based menu planning will be permitted. The final rule drops the proposed rule requirement to require administrative reviews to cover two weeks of menus and production records; instead, the final rule keeps the current one week review requirement. The final rule, like the proposed rule, would include breakfast in SA administrative reviews.[40]

  SAs are currently required to conduct a CRE for each SFA once every 5 years; to conduct a nutrient analysis via SMI review for only those SFAs with food-based menu planning systems (although approximately 30 percent of these SFAs elect to conduct the nutrient analysis themselves); to review menus from a one-week period preceding the review date; and to review a breakfast meal only in the case of a follow-up CRE (which is only conducted in those cases in which problems are noted in the initial CRE). Total costs for each SA to complete a CRE include costs for staff labor, travel (including transportation, accommodations, and meals/incidental expenses), and possible printing costs for those SAs that provide CRE results to SFAs and FNS in hard copy rather than electronically.

[40] FNS estimated in 1994 that extending the SFA review cycle from four to five years would decrease costs associated with this effort by 20 percent. (June 10, 1994, Federal Register Vol. 59, No. 111, p. 30234) A similar, but opposite, effect might be expected from shortening the cycle from five to three years.

Limited discussion with a small number of SA and FNS Regional Office officials suggest that a typical CRE or SMI review costs about $2,000 in 2010, with about half of that cost used for staff travel. Because travel is a largely fixed cost, SAs that previously conducted separate CRE and SMI reviews should realize some savings once SMIs are ended and the nutrient analysis is made part of the consolidated administrative review. That may help offset some of the cost of increased review frequency. A mid-sized State that now conducts 100 CRE reviews might incur annual expenses of $200,000. Under the final rule, that SA could expect to conduct 2/3 more administrative reviews, or roughly 167 per year. If we assume conservatively that the SA realizes no savings from elimination of SMI reviews, its review costs would increase by $134,000 per year – an upper-bound estimate. If all SAs incurred this same expense, the total cost would be roughly $8 million per year by FY 2013.

3. USDA/FNS

FNS will assist State Agencies by providing nutrition education, training, guidance, and technical assistance to facilitate their work with local school food professionals. This may include developing training standards, materials, updated measures for nutrition analysis, and revisions to the food buying guide.

While we expect a small increase in administrative burden for FNS under the rule because of the need to provide additional training and technical assistance to SAs, and to support their role in the administrative review process, this may largely be met by adapting existing efforts to the new requirements.

D. Food Service Equipment

Changes in meal pattern requirements may require some SFAs to replace or purchase additional foodservice equipment. For example, some SFAs may need to replace fryers with ovens or steamers. In FY 2009, FNS solicited requests from SFAs for food service equipment grants. In response to its solicitation, FNS received a total of approximately $600 million in grant requests from SFAs. FNS awarded grants for such purposes totaling $125 million, using $100 million from funds provided by the 2009 American Recovery and Reinvestment Act (ARRA) and $25 million provided by the FY 2010 Agriculture Appropriations Act. The strong response to these grant programs indicates that schools could make productive use of an even greater investment in kitchen equipment. However, much of that demand is associated with the routine need to replace equipment that is nearing the end of its useful life – a cost that is appropriately covered by USDA meal reimbursements and other sources of food service revenue. Although some schools may need additional upgrades to prepare meals that meet the new standards, we do not have the data necessary to assess that need or to estimate the associated cost. The $125 million in kitchen equipment grants distributed to schools through ARRA funds and the FY 2010 appropriation should have addressed much of the most pressing need. For these reasons, we do not include additional incremental equipment costs in our final rule estimate.

Our decision not to include an additional equipment cost in our proposed rule estimate generated comments from school officials and foodservice industry representatives. Those comments do not provide enough information on which to base a reliable estimate of the need for additional kitchen equipment as a result of the rule. The comments confirm that the need, where it exists, will vary significantly. Although we cannot reliably estimate the aggregate cost of meeting the need for additional equipment, we provide one estimate in the Section F below. Additional detail on the comments received from schools and the foodservice industry on this point is discussed in Section E.

E. Comments on Proposed Rule

As noted in the preamble to the final rule, USDA received more than 130,000 comments on the proposed rule. Comments on the content of the rule itself are discussed in the preamble. Other comments, addressed specifically to the proposed rule's impact analysis, are discussed here.

a. Proposed Rule is Too Costly

Many commenters expressed concern that the proposed rule was too costly. Schools and school districts would not be able to meet the proposed rule's meal standards without additional resources from Federal, State, or local governments. Some of these commenters noted that the cost of the proposed rule exceeded the 6 cents per lunch that would follow adoption of the new meal requirements. Many also noted that State and local governments were not in a position to provide school districts with additional funding. The result, some commenters warned, was that schools might stop serving reimbursable breakfasts under the SBP. Other commenters suggested that schools might even stop serving reimbursable NSLP lunches.

In response to these comments, the final rule modifies the proposed rule's meal pattern requirements. The effect of those modifications is to reduce the cost to schools and SFAs of implementing the rule. The modifications are discussed in detail in the rule, and summarized in Section II of this impact analysis. The modifications offer schools short term savings, relative to the proposed rule, by phasing in the rule's breakfast fruit and grain requirements. As a result of elimination of the proposed rule's breakfast meat requirement, the ongoing cost of the final rule after full implementation is also reduced.

Easing the proposed limit on the amount of starchy vegetables that schools may offer at lunch contributes modestly to the reduced cost of the final rule relative to the proposed rule. More significant savings are realized through a reduction in the lunch pattern's grain requirement.

Part of the difference in the estimated 5-year costs of the proposed and final rules is due to lower projected food cost inflation and increased student participation since preparation of the proposed rule estimate. To facilitate comparison of the estimated costs of the proposed and final rules, we prepared two estimates of the final rule's provisions. The first uses the most current food inflation and student participation figures; this is our primary estimate summarized in Table 6. The second applies the same food inflation and student participation estimates that we used in our proposed rule cost estimate. That is, we use the projections of food inflation for years after

FY 2009 that we developed for the proposed rule. (Our primary estimate for the final rule uses actual inflation through August 2011, and an updated projection for years after FY 2011.) The difference between this second estimate and the estimated cost of the proposed rule provides a more direct measure of the reduction in cost due to changes in the content of the proposed and final rules. Using that difference as our basis of comparison, the final rule reduces costs over the first 5 years by almost $2.9 billion, or 42 percent, as compared to the proposed rule.

Table 12: Reduction in Estimated Cost of Final Rule Relative to Proposed Rule

	Fiscal Year					
	2012	**2013**	**2014**	**2015**	**2016**	**Total**
Proposed rule	$181.5	$1,246.8	$1,401.9	$1,923.8	$2,041.3	**$6,795.2**
Final rule - primary estimate	42.8	294.2	370.6	1,254.7	1,316.2	**3,278.5**
Difference	**-$138.7**	**-$952.6**	**-$1,031.2**	**-$669.1**	**-$725.1**	**-$3,516.7**
Proposed rule	$181.5	$1,246.8	$1,401.9	$1,923.8	$2,041.3	**$6,795.2**
Final rule - with proposed rule inflation and participation estimates	54.8	385.0	484.5	1,460.0	1,555.3	**3,939.6**
Difference	**-$126.6**	**-$861.8**	**-$917.3**	**-$463.9**	**-$486.0**	**-$2,855.6**

In response to comments that an additional 6 cents per reimbursable lunch[41] falls short of our estimated per meal cost of the proposed rule, we point out that the HHFKA contains a comprehensive package of school lunch and breakfast reforms. These reforms are intended to both increase the quality of school meals and competitive school foods offered to students, and to address financial and funding issues. These latter provisions are expected to increase the amount of revenue generated by SFAs while eliminating the subsidization of paid lunches and non-program foods with Federal funds meant to support reimbursable meals generally, and meals served to free and reduced-price eligible children in particular. The impact analysis contained in the interim final rule prepared for Sections 205 and 206 of HHFKA estimates that those provisions will increase SFA revenues by $7.5 billion through FY 2015.[42] HHFKA section 205 is designed to gradually reduce the disparity in per-meal school revenue from reimbursable paid lunches relative to the per-meal Federal reimbursement for free lunches. Section 206 requires schools to increase the share of SFA revenue generated by nonprogram foods to a level at least as great as nonprogram food's contribution to total SFA food costs.

b. Costs are Understated

Some commenters felt that the cost estimate presented in the proposed rule is understated. As we describe in Section III.B.2., our methodology relies primarily on data collected by USDA in

[41] Section 201 of HHFKA provides an additional 6 cents to schools for each NSLP lunch that meets this rule's meal pattern requirements.
[42] *Federal Register*, Vol. 76, No. 117, pp. 35301-35318.

SNDA-III to estimate the types and quantities of food offered by schools to program participants. SNDA-III collected information from schools in SY 2004-2005. We believe that our use of the data from that study, which is several years old, presents a greater risk of overstatement than understatement of the cost of the rule, holding other factors constant. The Dietary Guidelines Advisory Committee completed its 2005 report in August 2004, just as SY 2004-2005 began. The 2005 Dietary Guidelines policy document was released by the U.S. Department of Health and Human Services and USDA in January 2005. These documents were released as SNDA-III data was being collected - too soon for substantial changes prompted by the Dietary Guidelines to be reflected in meals offered to students.

In the years since data was collected for SNDA-III, schools and USDA have taken steps to bring school meals into closer compliance with the 2005 Dietary Guidelines. One example, cited by IOM, is the recent improvement in USDA Foods offered to schools through the USDA's commodity programs.[43] These changes provide schools with an increased variety of whole grain, low fat, and low sodium products for use in healthier school meals. Other changes have been initiated by schools. The School Nutrition Association's 2010 "Back to School Trends Report" highlights some of the most recent changes that schools are making in anticipation of new Federal standards[44]:

> 95% of schools districts are increasing offerings of whole grain products
> 90.5% are increasing availability of fresh fruits/vegetables.
> 69% of districts are reducing or eliminating sodium in foods
> 66% of districts are reducing or limiting added sugar
> 51% of districts are increasing vegetarian options[45]

Our use of SNDA-III data means that our cost estimate does not reflect the most recent progress that schools have made toward adoption of Dietary Guidelines recommendations. At least one non-profit organization offered a comment on the proposed rule that concurs with that assessment. The commenter's primary point was that we overstate the savings from replacing more expensive high fat milk with less expensive low fat and fat free varieties; the commenter notes that many schools have already made that transition. We acknowledge that the potential savings of the final rule's milk provision may be overstated in our cost estimate. But that savings is potentially overstated for the same reason that the costs of meeting the rule's other food group requirements may be overstated. Schools have taken recent steps to adopt Dietary Guidelines recommendations on vegetables, fruit, whole grains, and sodium; schools' gradual adoption of Dietary Guidelines recommendations has not been limited to milk. Because our projected savings from the rule's milk provision is much lower than our projected cost of the rule's vegetable, fruit, and whole grains provisions, we believe that the risk that we overstate the cost of the rule exceeds the risk that we understate its cost.

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[43] "The [USDA] Commodity Program has made substantial improvements in its offerings in recent years to become better aligned with Dietary Guidelines for Americans and to be more responsive to its 'customers.'" (IOM 2009, p. 188)

[44] This is just a summary of recent changes adopted by schools. Schools have been moving toward 2005 Dietary Guidelines standards over several years.

[45] Figures taken from the SNA's website (http://www.schoolnutrition.org/Content.aspx?id=6926, accessed 10/10/11).

c. Analysis Does Not Capture Full Effect of Recent Food Inflation

Some commenters argued that we understated or did not adequately account for food inflation in our proposed rule cost estimate. Both our proposed and final rule cost estimates use food group specific inflation figures from the BLS to estimate current year prices (FY 2011 prices for the final rule analysis) from a set of baseline prices paid by schools in SY 2005-2006 (taken from the SLBCS-II). Both analyses use those current year estimates to project prices through FY 2016.

In our final rule estimate we use a 7-year historic average of food inflation, by food group, to project prices. Our proposed rule estimate used a 5-year historic average to inflate food costs. In developing our final rule estimate we recognized that actual food price inflation since we prepared our proposed rule estimate was substantially lower than inflation over the previous 5 years. We adopted a 7-year historic average in our final rule cost projections in order to temper the effects of relatively low recent food price inflation. This yields a slightly higher estimate for our final rule than results from a 5-year average projection factor. We do this to avoid the risk of understating the cost of the final rule.

d. Analysis Does Not Account For Higher Costs of Healthier Foods

Some commenters referred specifically to the higher costs of whole grains and vegetables emphasized by the rule. Others referred to the additional costs necessary to produce low-sodium school meals. We address these separately.

Higher prices for food groups emphasized by the rule

Our proposed rule and final rule cost estimates develop separate prices for each of the food subgroups with specific standards in the rule. For example, we estimate separate prices for whole grains and refined grains, for whole fruit and fruit juice, and for the dark green, red-orange, starchy, and "other" vegetable subgroups. In each of these cases, we estimate higher unit prices for the food subgroups emphasized by the rule. In some cases the price premium for these food subgroups may reflect lower supply in the school food marketplace. As industry increases the supply of these products in response to higher school demand, economies of scale may reduce their cost. Our cost estimates for both the proposed and final rules discount the possibility that prices for these foods may moderate over time. Again, we do this to avoid understating the cost of the rule.

Added cost of producing meals with less sodium

The proposed rule's first intermediate sodium targets were designed to be met by schools through menu and recipe changes using currently available foods. The proposed rule's second intermediate target was designed to be met with the help of the food industry through changes that can be met with current food processing technology. The proposed rule analysis stated that "a reduction in sodium can be achieved at minimal cost, at least over the short term, when sodium requirements are only partially phased-in." But the analysis also noted that meeting the rule's sodium targets would likely require replacing some packaged foods with foods prepared

from scratch. To clarify, we recognize that meeting even the first sodium target has some cost; however, we do not estimate that as a separate component cost in either the proposed or final rule analyses. Much of the cost of meeting the proposed and final rules' short term sodium targets is contained in the cost of substituting prepared foods for foods cooked from scratch in schools or central kitchens. We account for this in our labor cost estimate. Our proposed and final rule analyses estimate that labor costs will rise nearly dollar for dollar with food costs. Over 5 years, the final rule estimates that labor costs will increase by $1.6 billion.

Our cost estimate extends only through FY 2016, two years before the final rule's second sodium target takes effect. As a result, we do not estimate the cost of meeting that target in SY 2017-2018, or the rule's final sodium target in SY 2022-2023. However, two provisions in the final rule respond to the challenge of meeting those targets. The first is a delay in the second intermediate target from 4 years post-implementation in the proposed rule to 5 years in the final rule. Lengthening the transition to lower sodium foods is intended, in part, to facilitate student acceptance. But it also gives industry more time to develop products that meet the rule's standards. To the extent that limited supply is a school cost issue, delaying the second intermediate target to 5 years should help reduce costs. The final rule also promises USDA review of schools' progress toward the rule's final sodium target, and allows for modifications to the sodium targets if necessary.

e. Analysis Understates Need for Additional Equipment and Infrastructure

School officials and others commented that our proposed rule analysis understated the need for additional investment in food preparation and storage equipment as schools move away from a "heat and hold" foodservice model, to a model that relies more on on-site preparation. Our proposed rule analysis discussed the $125 million for school foodservice equipment provided to schools through the 2009 American Recovery and Reinvestment Act (ARRA) and the FY 2010 Agriculture Appropriations Act. Although the proposed rule analysis recognized that the demand for ARRA grants greatly exceeded the amount available, the analysis noted that much of that demand was driven by the routine need to replace aging equipment, costs that are appropriately covered by USDA meal reimbursements and other sources of food service revenue. The proposed rule analysis did not include an additional cost tied specifically to meeting the proposed rule meal patterns.

Some commenters offered estimates of the cost required to equip schools to produce more foods on site. These costs ranged from $4,000 per school for new equipment, to $500,000 or more for a full kitchen and serving site renovation (an estimate given by a foodservice industry representative). Commenters indicated that preparing more meals on-site would require investment in additional refrigeration equipment, microwaves and combination ovens, storage space, sinks, cutting boards and knives. What these comments cannot tell us is the percent of schools in need of new equipment, or the average per-school cost to meet that need. If fully half of all schools require investments averaging $5,000, then the total cost of new equipment necessary to prepare meals that meet the final rule standards would be $250 million. In the end, we do not have the data necessary to develop a reliable estimate of need in excess of the routine costs of replacing outdated equipment. In Section F we present an alternate cost estimate of the

final rule under a different assumption about the need for additional investment in school kitchen equipment.

F. Uncertainties

We made several simplifying assumptions in developing this cost estimate, reflecting gaps in available data and evidence. The most significant simplifications are discussed in Table 13. In most cases, our primary estimate reflects conservative assumptions, to avoid understating the costs of the rule. In this section, we describe the impact of several alternative assumptions on the estimate. The cost impacts of these alternatives are presented in Table 14.

Table 13: Simplifying Assumptions

Item	Explanation and Implications of Simplifying Assumptions
Take Rates	For each of several food groups, we used SNDA-III data to compute average "take rates" equal to the percentage of food servings taken by students for each serving offered to them. Take rates under current program rules vary by school, grade level, and menu planning system. They are, at best, a rough predictor of student behavior under the new rule, which imposes a single food-based meal planning system across all schools, and requires schools to offer a mix of foods somewhat different than many students are accustomed to. We apply these take rates to generate our final rule cost estimate. Different take rate assumptions could produce higher or lower cost estimates. Take rates higher than the ones used in our estimate imply that students will select more foods from menus that meet final rule standards than they now select from more familiar current school menus; we believe that risk is reasonably low, at least in the short term. It may be more likely that actual take rates will fall below our estimates. However, the possibility of lower take rates is constrained by the requirement that students select enough components to constitute a reimbursable meal.
Student Participation	The cost estimate assumes no change in student participation following introduction of the rule's new meal pattern requirements. However, we recognize that participation may increase due to better meals or decrease when favorite school foods are replaced with unfamiliar or less appealing options. We chose not to estimate a participation effect given the uncertainty about how schools will incorporate new foods into their menus, and what changes schools will make to a la carte and other non-NSLP/SBP "competitive" foods, factors known to affect NSLP/SBP participation. Schools have a financial interest in preserving the revenue stream that comes with serving Federally-reimbursable school meals. It is also unclear whether participation effects, if any, may prove temporary or permanent. We estimate the cost of the rule under an assumption of increased and reduced student participation in the uncertainties section.
USDA Foods	We include USDA Foods (formerly USDA commodities) in both the quantity and value of food served in its baseline and final rule cost estimates. This treatment of USDA Foods is consistent with the SLBCS-II which includes the value of USDA Foods in its computation of the cost of producing a school meal. We assume that USDA Foods will contribute comparably to the overall cost of preparing school meals under current rules and under the new rule. We believe it is reasonable to ignore the value of USDA Foods in computing the estimated cost increase of the rule.

Item	Explanation and Implications of Simplifying Assumptions
Whole Grains	We apply a single take rate to both whole grain rich and refined grain products. A less conservative approach would have applied a lower take rate to whole grain foods, at least when offered singly, rather than as part of a combination entree. Further, this take rate is the same take rate observed in SNDA-III where the relative share of whole grain rich products is lower than the 50 percent share that schools must offer in the first two years of implementation, and much lower than the 100 percent share that must be offered thereafter. Testimony before the IOM expert committee by University of Minnesota Professor Leonard Marquart documented steps SFAs can take to phase in whole grains in a manner that promotes high take rates.
Labor Rates	We assume that the relative contributions of food and labor to the total cost of preparing reimbursable school meals will remain fixed at the levels observed in the SLBCS-II study. The study found that the cost of purchasing food accounted for 45.6 percent of SFA reported costs on average, while labor accounted for 44.5 percent of reported costs. We therefore estimate that labor costs will increase on a nearly dollar for dollar basis with estimated food costs. Our assumption leads to a substantial increase in estimated labor costs, one that assumes schools may rely less on prepared foods and more on on-site preparation. Nevertheless, USDA received comments from some individuals and organizations indicating that our proposed rule understates the likely increase in labor costs. To respond to these comments, we re-estimate the cost of the proposed rule assuming a bigger increase in labor costs in Section F.
Macronutrient Requirements and Calories	The cost estimate developed in this impact analysis is based entirely on the cost of adding or deleting foods from particular food groups. The cost estimate accounts for current price differences in whole grains compared to refined grain products, fat free and low fat milk compared to 2 percent or whole milk, whole fruit compared to fruit juice, and vegetables by subgroup. But it does not account directly for differences in the costs of comparable combination entrees with different levels of sodium, fat, or calories. SNDA-III found that school lunches offered to students in SY 2004-2005 provided, on average, about 11 percent of calories from saturated fat. The final rule would limit this to 10 percent - a relatively modest reduction. Our cost estimate does take into account the added cost of more fruits and vegetables. It also takes into account the cost of shifting to a wider variety of vegetables. Finally, the estimate accounts for the replacement of higher fat content milk with low fat and skim milk. All of these steps implicitly incorporate the cost of offering lower calorie and lower fat content meals into our estimate. We mention above that that the first intermediate sodium target can be achieved with changes to school menus and preparation methods using foods already available in the marketplace. To the extent that the rule's first sodium target requires more on-site preparation of meals, we account for that in our labor cost estimate. We estimate that the additional cost of acquiring lower sodium versions of processed foods to meet the rule's initial sodium target will be minimal. This is one of the very few assumptions that, if wrong, tends to understate the cost of the rule. But, given the decision to err on the side of overstating costs when making most other assumptions, we believe that the upside risk to an error on this assumption is small.

a. Change in Participation – 2 Percent Increase

As discussed in Table 13 above, we assumed that student participation would not change following the introduction of new meal requirements. Table 14 Sections A and B model the effects of altering that assumption.

Section A estimates the effect of a two percent increase in student participation on the cost of the rule relative to our primary cost estimate in Table 6. The dollar figures in Section A are the estimated cost to schools of preparing all meals served under our baseline assumption plus an additional 2 percent; the costs are not just limited to the incremental per-meal costs of the final rule. The additional meals are eligible for USDA reimbursement at the appropriate free, reduced price, or paid rates. However, the figures shown in Section A are not offset by these increased Federal reimbursements. The net cost to schools, after accounting for Federal reimbursements, would be lower. Because these costs reflect the provision of improved meals to additional children, we would expect a commensurate increase in the benefits resulting from addition of more fruits, vegetables, and whole grains to the diets of participating children. This participation assumption would result in a $1.3 billion increase over the cost of our primary estimate.

b. Change in Participation – 2 Percent Decrease

Table 14, Section B models the effect of a two percent decrease in participation upon implementation of the new rule. A reduction in participation reduces the cost of compliance with the rule, relative to the primary cost estimate in Table 6.[46] Again, because the cost reduction reflects the provision of improved meals to fewer children, we would expect a proportionate decrease in the rule's benefits for participating children. This reduction in cost is a reduction in the entire cost of serving 2 percent fewer meals, not just the incremental per-meal cost of complying with the final rule. Schools would realize a partially offsetting decrease in Federal meal reimbursements; that offset is not shown in Table 14. The effect of a 2 percent decrease in student participation would be to decrease the cost of implementing the final rule by $1.3 billion.

c. Higher Rate of Increase in Labor Costs than Food Costs

Our primary cost estimate assumes that the ratio of labor to food costs will remain fixed at the ratio observed in the SLBCS-II. Because we estimate a substantial increase in school food costs, our fixed labor to food cost assumption leads to a substantial increase in labor costs.

Some increase in labor costs is likely. Schools may find it necessary to prepare more meals on site to incorporate added vegetables and whole grains, and to reduce levels of sodium and fat. In addition, schools are likely to incur additional expense to train foodservice workers on the new meal requirements. However, commercial suppliers can be expected to develop and introduce healthier products for the school market ahead of implementation of a final rule; other products may be introduced after implementation. Schools may find that new training replaces some training planned in existing budgets.

[46] This reduction in cost comes at the expense of reduced federal meal reimbursements.

At least one change reflected in the final rule is intended, in part, to help reduce labor costs relative to the proposed rule. The proposed rule included a separate meat standard for breakfast. The final rule drops that requirement, preserving schools' ability to serve meat as a substitute for grains at breakfast, but not requiring schools to offer meat. USDA expects that this change will support schools that serve breakfast in the classroom, a model that may require less labor cost than breakfast served in the school cafeteria.

Although we believe that the risk that we overstate the labor costs necessary to implement the rule is as likely as the risk that we understate labor costs, comments received from school officials and foodservice and nutrition professionals argue that our labor cost estimate may be too low. Commenters cited the need to hire new kitchen staff to prepare more meals from scratch as a factor that might change the current ratio of labor to food costs.

Our primary labor cost estimate relies on the observation that the ratio of labor to food costs was about the same at two points measured 13 years apart. We acknowledge the uncertainty inherent in the assumption that this ratio will remain unchanged even as substantial changes to the meal patterns are implemented by schools. And we therefore recognize the risk that the absolute dollar cost for labor in our final rule estimate is too low. If the cost of labor needed to implement the final rule exceeds the amount in our primary estimate by 10 percent, then the cost of the final rule would rise by $160 million.

d. Higher Food Inflation

The final rule estimate's food inflation methodology in described section III.B.1. That discussion notes that inflation over the most recent 2 years was lower for most food subgroups than inflation over the five years prior to those two. Our proposed rule estimate used a 5-year historic average to project food costs through FY 2016. In an effort to limit the effects of low recent inflation on our cost estimate, our final rule methodology uses a 7-year average to project food costs, rather than a revised 5-year estimate using only the most recent food inflation figures. This methodology retains all of the 5 years of relatively high food inflation that we used in our proposed rule methodology. We took this step to minimize the risk of understating the cost of the final rule. It is possible, nevertheless, that food inflation will accelerate in the short term. If food prices from fiscal years 2012 through 2016 match the rate of inflation over the five years that ended in FY 2009, then the cost of the final rule would increase by $240 million.[47]

e. Additional Need For Foodservice Equipment

The cost estimate in our proposed rule (and the primary estimate in this final rule analysis) does not include an additional cost for new foodservice equipment. As we discuss in section E above, commenters offer much different estimates of the need for new kitchen equipment to prepare more foods on site as a means of complying with the rule. These figures do not allow us to estimate the dollar value of that need with any certainty. Table 14 includes a revised final rule estimate that assumes half of all schools will need to invest $5,000 in new kitchen equipment soon after implementation of the rule. We show half of this $250 million cost as an upfront

[47] This estimate includes a proportionate increase in labor costs to remain consistent with our labor cost methodology.

expense, and the other half as an expense incurred in the first full year of implementation of the rule.

Table 14 below assumes that State administrative costs are not impacted by any of the alternate assumptions (a-e) listed above.

Table 14: Cost of Final Rule under Alternate Assumptions

	Fiscal Year					
	2012	**2013**	**2014**	**2015**	**2016**	**Total**
Section A. Change in Participation - 2 Percent Increase						
Food Costs	$43.2	$285.1	$337.7	$799.9	$837.7	**$2,303.7**
Labor Costs	42.2	278.3	329.6	780.6	817.5	**2,248.1**
State Admin	0.1	8.9	9.1	9.4	9.7	**37.1**
Total	**$85.5**	**$572.3**	**$676.4**	**$1,589.9**	**$1,664.8**	**$4,588.9**
Section B. Change in Participation – 2 Percent Decrease						
Food Costs	-$1.0	-$10.4	$28.2	$460.7	$484.8	**$962.4**
Labor Costs	-1.0	-11.1	27.6	449.5	473.1	**938.1**
State Admin	0.1	8.9	9.1	9.4	9.7	**37.1**
Total	**-$1.9**	**-$12.6**	**$64.9**	**$919.6**	**$967.6**	**$1,937.6**
Section C. Higher Rate of Increase in Labor Costs than Food Costs						
Food Costs	$21.1	$137.4	$183.0	$630.3	$661.2	**$1,633.0**
Labor Costs	23.7	162.6	196.4	676.6	709.8	**1,769.2**
State Admin	0.1	8.9	9.1	9.4	9.7	**37.1**
Total	**$44.9**	**$308.9**	**$388.5**	**$1,316.2**	**$1,380.7**	**$3,439.3**
Section D. Food Inflators from Proposed Rule for 2012-2016 Food Cost projections						
Food Costs	$21.8	$146.8	$199.4	$671.6	$715.6	**$1,755.4**
Labor Costs	22.2	157.3	194.6	655.4	698.4	**1,727.9**
State Admin	0.1	8.9	9.1	9.4	9.7	**37.1**
Total	**$44.2**	**$313.0**	**$403.1**	**$1,336.4**	**$1,423.7**	**$3,520.4**
Section E. Increased Equipment Cost						
Food Costs	$21.1	$137.4	$183.0	$630.3	$661.2	**$1,633.0**
Labor Costs	21.5	$147.9	$178.6	$615.1	$645.3	**1,608.3**
State Admin	0.1	8.9	9.1	9.4	9.7	**37.1**
Equip Costs	125.0	125.0	0.0	0.0	0.0	**250.0**

Total	**$167.8**	**$419.2**	**$370.6**	**$1,254.7**	**$1,316.2**	**$3,528.5**

G. Comparison of Proposed Rule and Final Rule Costs

The key differences between our proposed rule and final rule cost estimates are discussed in previous sections of this RIA. Most of the estimated reduction in cost is due to policy changes, but a significant reduction is also realized by lower food inflation since preparation of the proposed rule cost estimate.

Inflation and other economic assumptions

The proposed rule used actual food price inflation through the end of FY 2009. The final rule incorporates nearly two additional years of actual food price inflation. Inflation over the two years ending in August 2011 was lower for most of the food groups affected by the rule than it was in the five previous years. This reduces our baseline cost of food as well as our projection of food prices through the RIA's forecast period. The final rule also uses USDA projections of school meal participation contained in the 2012 President's budget. The proposed rule relied on data in the 2011 President's budget. The more recent participation projections slightly increase the cost of the breakfast meal patterns and reduce the cost of the lunch meal patterns relative to the proposed rule. The net effect of changes to our food inflation and student participation projections is a 5-year $700 million reduction in the cost of the final rule relative to the proposal.

Breakfast meal patterns

The most significant reduction in the estimated cost of the final rule relative to the proposed rule is due to changes in the final rule's breakfast provisions. The final rule's phased implementation of the meal pattern's fruit and grain requirements, and elimination of the proposed rule's separate meal and meat alternate requirement reduce the cost of the rule by $2.7 billion over 5 years.

Lunch meal patterns

Additional savings are realized through a reduction in the final rule's lunch meal pattern grain requirement relative to the proposed rule. The final rule also includes changes to the vegetable component of the proposed rule's lunch meal pattern. The final rule eases the proposed rule's 1 cup per week limit on starchy vegetables, and it replaces the proposed rule's orange vegetable subgroup with a red/orange group that now includes tomatoes. Replacement of the orange vegetable subgroup with a red/orange subgroup was prompted by the 2010 Dietary Guidelines. The final rule reduces the weekly requirement for "other" vegetables, which previously included tomatoes, and increases the requirement for red/orange vegetables relative to the proposed rule requirement for orange vegetables. The net effect of changes to the vegetable and grain requirements at lunch is a relatively modest $100 million reduction in cost over 5 years.

Table 15
Changes in Cost of the Final Rule Relative to the Proposed Rule

	Fiscal Year					
	2012	**2013**	**2014**	**2015**	**2016**	**Total**
Proposed rule	$181.5	$1,246.8	$1,401.9	$1,923.8	$2,041.3	**$6,795.2**
updated economic and participation projections	-$15.3	-$110.5	-$136.2	-$205.7	-$241.9	**-$709.6**
changes to breakfast meal pattern requirements	-$121.1	-$826.7	-$875.9	-$425.9	-$444.1	**-$2,693.7**
changes to lunch meal pattern requirements	-$2.3	-$15.4	-$19.1	-$37.5	-$39.1	**-$113.4**
Final rule	$42.8	$294.2	$370.6	$1,254.7	$1,316.2	**$3,278.5**

H. Implementation of Final Rule – SFA Resources

We estimate that the new meal patterns may raise the average cost of producing and serving school lunches by about 5 cents on initial implementation of the rule. By FY 2015, when the food group components are fully phased in, the cost per lunch may be 11 cents higher than our baseline estimate; the cost per breakfast may be 28 cents higher than our baseline.

As we discuss in Section E, the Healthy, Hunger-Free Kids Act contains a comprehensive package of school meal reforms that call for an update to the meal patterns and provide for increased SFA revenue. USDA estimates that the $3.2 billion 5-year cost of this rule is more than offset by the impact of other HHFKA provisions on SFA revenues.

HHFKA's meal pattern and revenue raising provisions are linked directly in the performance-based increase in Federal financing for school lunches. Schools that successfully implement the final rule standards will receive an additional 6 cent reimbursement for each lunch served. The Congressional Budget Office estimates that an additional 6 cents per lunch would raise $1.5 billion for SFAs in the first 5 years after implementation of the rule.

HHFKA contains two additional provisions to ensure that Federal reimbursements are used as intended to provide quality meals to program participants. The first requires schools to gradually raise the per-meal revenue generated from paid lunches to an amount equal to the Federal reimbursement for free lunches. That revenue could come from student payments or State or local sources. The second requires that the revenue generated from non-program foods as a percent of food costs match the revenue to food cost ratio of program meals. USDA estimates that these two provisions will raise a combined $7.5 billion in the 5 years following their July 1, 2011 effective date.

Schools will face different costs to implement this final rule. Schools with menus that already emphasize fruits, a variety of vegetables, and whole grains may need to make fewer changes, and the costs of implementation in those schools may be lower than average. Because the per-meal costs of complying with the new requirements are much higher for breakfast than for lunch, the overall costs of implementation in schools that serve more school breakfasts relative to lunches may be higher than the costs faced by schools that do not serve breakfast.

Schools will also benefit differently from HHFKA's revenue provisions. Schools with relatively few students who pay full price for program meals stand to gain little from HHFKA's paid lunch provision. Similarly, schools that sell few à la carte items will realize little revenue from an increase in à la carte prices. At the same time, schools that serve mostly free and reduced-price students and sell little à la carte can rely on significant Federal funding for each SFA dollar spent to purchase and prepare school foods.

The experience of some schools suggests that substantial progress toward implementation of the rule can even be achieved with existing resources. USDA's HealthierUS Schools Challenge (HUSSC) recognizes elementary schools that meet voluntary school meal and physical activity standards. HUSSC school meal standards exceed NSLP requirements on several levels, including requirements for a variety of vegetables each week, including dark green and orange vegetables and legumes; a variety of whole fruits, and limits on fruit juice; and whole grain and low fat milk requirements. USDA has certified more than 1,600 HUSSC schools since 2004. HUSSC schools have demonstrated an ability to operate cost-effective school meals programs that emphasize many of the same foods required by the final rule. These schools receive no financial assistance from USDA beyond the meal reimbursements and USDA Foods available to other schools that participate in the Federal school lunch and breakfast programs. Like other service businesses, schools may need to consider changes to their operations to increase efficiency and meet the requirements of the rule. HUSSC schools have demonstrated an ability to operate cost-effective school meals programs that meet many of the final rule's requirements. These schools may offer models for others as implementation moves forward.

I. Impact on Participation

As noted in Table 13, the cost estimate in this analysis assumes no net change in student participation following introduction of the rule's new meal pattern requirements. This assumption reflects uncertainties in a number of areas, including how schools will reflect the new requirements in menus, the acceptance of those changes by students, and potential changes in prices for reimbursable paid meals to provide additional revenue. These factors are discussed below.

1. Acceptance of meals

Any revision to the content of school meals or the method of preparation may have an effect on the acceptance of school meals. Concerns are often raised that students may react negatively to changes designed to improve nutrition. USDA launched the School Meals Initiative for Healthy Children (SMI) in 1995 to help schools improve the nutritional quality of NSLP and SBP meals. The SMI offers an opportunity to examine how students react to substantial changes in school meal patterns.

As a result of the SMI many school food service directors reported making changes in procurement and preparation practices (Abraham, 2002). For example, they reported increased purchases of low-fat/reduced-fat foods (81 percent) and fresh fruits and vegetables (75 percent). The majority reported no change in food waste. However, to the extent that there was change in

the amount of food wasted, more respondents reported a reduction rather than an increase in food waste (with the exception of cooked vegetables). School food service directors report that the SMI has generally had a neutral-to-positive impact on program performance.

SNDA-III found that "[c]haracteristics of NSLP lunches offered, including percent of calories from fat, whether dessert or French fries were frequently offered, and average number of fresh fruits and vegetables offered per day, were generally not significantly associated with NSLP participation."[48] This suggests that changes in meal patterns that enhance nutrition can be well received by students. Furthermore, the increased emphasis on a healthy school nutrition environment in recent years, and greater awareness of the importance of healthy eating habits in schools, may help to support student acceptance of changes in program meals.

There is also a strong and growing school nutrition effort and infrastructure already in place. For example, Team Nutrition is an FNS initiative to support healthier meals through training and technical assistance for food service, nutrition education for children and their caregivers, and school and community support for healthy eating and physical activity. Similarly, in 2004 Congress required all school districts to establish local wellness policies. Through these policies schools have made changes to their school nutrition environments and improved the quality of foods offered to students. In the context of these initiatives, implementation of the final rule is only the next step in a process of ongoing local, State, and Federal efforts to promote children's nutrition and health.

2. Impact of Price on Participation

FNS estimates that the average cost of preparing and serving school meals may increase by 8 percent by FY 2015. Some SFAs may raise student prices for paid meals (above the paid lunch revenue target required by HHFKA) to compensate for some of this increase in cost. We recognize that increased paid meal prices may reduce NSLP paid meal participation. Mathematica®, Inc. modeled the effect of paid meal prices on student participation as part of the SNDA-III study.[49] All else equal, students who were not income-eligible for free or reduced-price meals were less likely to participate in the program when the full price of the meals was higher. For lunch, the model estimates a 0.11 percent decrease in participation for each 1 cent increase in paid lunch prices.[50] For breakfast, the model estimates a 0.12 percent decrease in participation per 1 cent increase in price.

The model's predicted student participation rate was 54 percent in schools that charged $2.00 for an NSLP lunch, compared to 59 percent in schools that charged $1.50. The study also predicts lower breakfast participation in schools that charged higher prices. Predicted participation was 10.3 percent in schools that charged $0.70 for an SBP breakfast versus 7.2 percent in schools that charged $1.00. Since meals meeting the new requirements will be improved in nutritional

[48] For breakfast, the study estimated that projected participation rates "were higher in schools that offered a greater percentage of calories from fat in the SBP breakfast; however, these differences were not statistically significant at conventional levels." USDA 2007, vol. II, pp. 113 and 127.
[49] USDA 2007, vol. II, pp. 116-117, 123-124
[50] This relationship between price and participation applies to prices in the range of $1.50 to $2.00 in SY 2004-2005 dollars. A much bigger price increase might trigger a bigger reduction in participation.

content it is not clear how this factor would balance against the effects of higher meal prices. Although price changes may be a necessary option for some SFAs, FNS expects that efforts designed to maintain participation would be concurrently implemented.

J. Benefits

As noted in the preamble to this final rule, NSLA requires that schools serving lunches and breakfasts under its program authority ensure that those meals are consistent with the goals of the most recent Dietary Guidelines for Americans and the Dietary Reference Intakes. The final rule, by updating program regulations consistent with Dietary Guidelines goals and aligning the regulations with the requirements placed on schools under the statute, will ensure that school meal nutrition requirements reflect current nutrition science, increase the availability of key food groups, better meet the nutritional needs of children, and foster healthy eating habits.

In so doing, it also provides a clear means of meeting the statutory requirements through a food-based meal pattern designed with the particular circumstances and challenges of school food service in mind, to ensure that it is feasible for school foodservice operators and does not jeopardize student and school participation in the meal programs. A related benefit of the rule is that it simplifies meal requirements to create a single, food-based approach to meal planning. This approach helps to simplify menu planning and monitoring, and streamline training and technical assistance needs.

Once implemented by schools, USDA projects that this rule will change the types and quantities of foods prepared, offered and served through the school meals programs (the sources of the costs described in this analysis). The rule is expected to result in (1) increased servings of fruits and vegetables, (2) replacement of refined-grain foods with whole-grain rich foods, and (3) replacement of higher-fat dairy products with low-fat varieties. As documented in the IOM recommendations, each of these changes corresponds to an inconsistency between the typical diets of school-aged children in the United States and the Dietary Guidelines/*MyPyramid* recommendations. In particular, the report cited an analysis of NHANES 1999-2002 data that showed that:

- Total vegetable intake was only about 40 percent of the *MyPyramid* levels, with intake of dark green and orange vegetables less than 20 percent of *MyPyramid* levels.

- Total fruit intake was about 80 percent of the *MyPyramid* levels for children ages 5-8, with far lower levels for older children.

- Intake of whole grains was less than one-quarter of *MyPyramid* levels, although total grain intake was at or above *MyPyramid* levels.

- Intake of dairy products varied by age, with the intakes of the youngest children exceeding *MyPyramid* levels, while those of older children were below those levels. However, most

dairy consumed contained 2 percent or more milk fat, while the Dietary Guidelines recommend fat-free or low-fat dairy products.[51]

In addition, the rule would make significant changes to the level of sodium in school meals over time. Research suggests that modest population-wide reductions in dietary salt could substantially reduce cardiovascular events and medical costs.[52] More specifically, a forthcoming study suggests that reducing dietary salt in adolescents could yield substantial health benefits by decreasing the number of teenagers with hypertension and the rates of cardiovascular disease and death as these teenagers reach young and middle age adulthood.[53]

The rule also makes substantial changes in the calorie targets for meals that are designed to promote healthful energy balance for the children served by these programs. For the first time, the rule sets maximum as well as minimum calorie targets, and creates a finer gradation of calorie levels by age. As a result, minimum calorie requirements for some groups are reduced by as much as 225 calories per lunch.[54] Implemented consistent with other requirements that ensure that lunches provide appropriate nutrient content, these changes in calorie levels can help to reduce the energy imbalance that contributes to obesity among the Nation's children, without compromising nutrition to support healthy growth and development.

This approach is fully consistent with the recommendations of the Dietary Guidelines for Americans. Recognizing that the Dietary Guidelines apply to a total diet, rather than a specific meal or portion of an individual's consumption, the intention of the rule is to make changes to school meals nutrition requirements to promote diets more consistent with the *Guidelines* among program participants. Such diets, in turn, are useful behavioral contributors to health and well-being. As the report of the 2010 Dietary Guidelines Advisory Committee notes, "evidence is accumulating that selecting diets that comply with the Guidelines reduces the risk of chronic disease and promotes health."[55] The report describes and synthesizes the evidence linking diet and different chronic disease risks, including cardiovascular disease and blood pressure, as well as the effects of dietary patterns on total mortality. Children are a subpopulation of particular focus for the Committee; the report emphasizes the increasing common evidence of chronic disease risk factors, such as glucose intolerance and hypertension, among children, and explains that "[e]vidence documents the importance of optimal nutrition starting during the fetal period through childhood and adolescence because this has a substantial influence on the risk of chronic disease with age."[56]

In response, the report notes improvements in food at schools as a critical strategy to prevent obesity, and related health risks, among children. Indeed, the Committee recommends "[i]mprov[ing] foods sold and served in schools, including school breakfast, lunch, and after-school meals and competitive foods so that they meet the recommendations of the IOM report on

[51] IOM 2009, pp. 49-53.
[52] See, for example, Smith-Spangler, 2010; Bibbins-Domingo, 2010.
[53] Bibbins-Domingo, 2010b.
[54] The minimum calorie level for a lunch served to Grade 7 students is 825 calories under current standards (Grades 7-12); this would change to a range of 600 calories minimum, 700 calories maximum under the new standards (Grades 6-8).
[55] Dietary Guidelines Advisory Committee, p. B1-2.
[56] Dietary Guidelines Advisory Committee, pp. B1-2, B1-3.

school meals (IOM, 2009) and the key findings of the 2010 DGAC. This includes all age groups of children, from preschool through high school."[57]

The linkage between poor diets and health problems such as childhood obesity are also a matter of particular policy concern, given their significant social costs. One in every three children (31.7 percent) ages 2-19 is overweight or obese.[58] Along with the effects on our children's health, childhood overweight and obesity imposes substantial economic costs, and the epidemic is associated with an estimated $3 billion in direct medical costs.[59] Perhaps more significantly, obese children and adolescents are more likely to become obese as adults.[60] In 2008, medical spending on adults that was attributed to obesity increased to an estimated $147 billion.[61]

Because of the complexity of factors that contribute both to overall food consumption and to obesity, we are not able to define a level of disease or cost reduction that is attributable to the changes in meals expected to result from implementation of the rule. As the rule is projected to make substantial improvements in meals served to more than half of all school-aged children on an average school day, we judge that the likelihood is reasonable that the benefits of the rule exceed the costs, and that the final rule thus represents a cost-effective means of conforming NSLP and SBP regulations to the statutory requirements for school meals.

There are other, corollary benefits to improvement in school meals that are worthy of note. The changes could increase confidence by parents and families in the nutritional quality of school meals, which may encourage more families to opt for them as a reliable source of nutritious food for their children. Improved school meals can reinforce school-based nutrition education and promotion efforts and contribute significantly to the overall effectiveness of the school nutrition environment in promoting healthful food and physical activity choices. Finally, the new requirements provide a clearer alignment between Federal program benefits and national nutrition policy, which can help to reinforce overall understanding of the linkages between diet and health.

IV. Alternatives

1. Make No Changes to Proposed Rule

The proposed rule closely followed the recommendations contained in the 2010 report of the IOM committee commissioned by USDA to propose changes to the NSLP and SBP meal patterns. Those recommendations were designed to reflect current nutrition science, the Dietary Guidelines, and IOM's Dietary Reference Intakes. The reforms contained in the proposed rule were well received by health and nutrition professionals, child advocates, academics, and parents. But, as summarized in the preamble to the final rule and in this analysis, school and SFA officials, other public sector officials, and the food industry expressed concern about the

[57] Dietary Guidelines Advisory Committee, p. B3-6.
[58] Ogden et al, 2010.
[59] Trasande et al, 2009.
[60] Whitaker et al 1997; Serdula et al May 1993.
[61] Finkelstein et al2009.

cost and feasibility of the proposed rule. The final rule reflects those concerns by scaling back the quantity of food contained in the proposal, especially at breakfast, relaxing the proposed rule's limitations on starchy vegetables, phasing in some provisions, and extending target dates for meeting the proposed rule's sodium standards. Those changes result in a significantly less costly final rule.

One alternative to the final rule is to retain the proposed rule without change. The proposed rule closely followed IOM's recommendations. IOM developed its recommendations to encourage student consumption of foods recommended by the Dietary Guidelines in quantities designed to provide necessary nutrients without excess calories. The final rule still achieves that goal. Students will still be presented with choices from the food groups and vegetable subgroups recommended by the Dietary Guidelines. In that way, the final rule, like the proposed rule, will help children recognize and choose foods consistent with a healthy diet.

The most significant differences between the proposed and final rules are in the breakfast meal patterns, and those differences are largely a matter of timing. The final rule allows schools more time to phase-in key IOM recommendations on fruit and grains at breakfast. Once fully implemented, the most important difference between the final and proposed rule breakfast meal patterns is the elimination of a separate meat / meat alternate requirement. That change preserves current rules that allow the substitution of meat for grains at breakfast. It also responds to general public comments on cost, and on the need to preserve schools' flexibility to serve breakfast outside of a traditional cafeteria setting.

Even with these changes, and with the less significant changes to the proposed lunch standards, the final rule remains consistent with Dietary Guidelines recommendations. The added flexibility and reduced cost of the final rule relative to the proposed rule should increase schools' ability to comply with the new meal patterns. The final rule's less costly breakfast patterns will make it easier for schools to maintain or expand current breakfast programs, and may encourage other schools to adopt a breakfast program.

Table 16 estimates the cost of the proposed rule using updated projections of student participation and food inflation. The estimated 5-year cost of the final rule, from Table 6, is $2.8 billion lower than this updated cost estimate of the proposed rule.

[Note that the estimate in Table 16 is about 11 percent lower than our cost estimate for the same set of provisions in the proposed rule Regulatory Impact Analysis.[62] The difference between the two estimates reflects lower food inflation for most food groups since preparation of the proposed rule estimate. As we discuss in Section III.B.1., lower recent inflation also reduces our projection of future price increases.]

[62] Table 15 also includes the effect of reclassifying tomatoes as a "red / orange" vegetable. Tomatoes were included in the "other" vegetable subgroup in our proposed rule cost estimate. Moving tomatoes from the "other" vegetable subgroup to the new "red / orange" subgroup is one of the changes contained in the 2010 Dietary Guidelines. Moving tomatoes back to the "other" vegetable subgroup for school meals was not considered by USDA and is therefore not reflected in this alternative to the final rule.

Table 16: Alternative 1
Estimated Cost of Proposed Rule

	Fiscal Year					
	2012	**2013**	**2014**	**2015**	**2016**	**Total**
Food Costs	$84.6	$574.3	$639.8	$868.8	$910.0	**$3,077.6**
Labor Costs	82.5	560.4	624.4	847.9	888.1	**3,003.3**
State AgencyAdministrative Costs	0.1	8.9	9.1	9.4	9.7	**37.1**
Total	**$167.2**	**$1,143.6**	**$1,273.3**	**$1,726.1**	**$1,807.8**	**$6,118.0**

2. Adopt Final Rule Lunch Meal Pattern Changes; Retain Proposed Rule Breakfast Patterns

From Alternative 1, above, we estimate that cost of the final rule is $2.8 billion lower than the cost of the proposed rule. Table 17 makes clear that most of this reduction is due to the final rule's breakfast meal pattern changes. Adopting all of the lunch provisions contained in the final rule[63], but retaining the proposed rule's breakfast provisions, would cost nearly $6 billion over 5 years, or $2.7 billion more than final rule. This alternative responds less effectively than the final rule to comments received by USDA from SFA and school administrators who expressed concerns about the cost of the proposed rule.

Table 17: Alternative 2
Adopt Final Rule Lunch Meal Patterns; Retain Proposed Rule Breakfast Meal Patterns

	Fiscal Year					
	2012	**2013**	**2014**	**2015**	**2016**	**Total**
Food Costs	$82.9	$562.8	$626.2	$845.8	$886.0	**$3,003.6**
Labor Costs	$80.9	$549.2	$611.1	$825.4	$864.6	**2,931.2**
State AgencyAdministrative Costs	$0.1	$8.9	$9.1	$9.4	$9.7	**37.1**
Total	**$163.8**	**$1,120.8**	**$1,246.5**	**$1,680.6**	**$1,760.2**	**$5,972.0**

3. Adopt Final Rule Breakfast Meal Pattern Changes; Retain Proposed Rule Lunch Patterns

This alternative highlights the relatively small difference in the cost of the proposed and final rule lunch provisions. The two key differences in the proposed and final rule lunch provisions have largely offsetting costs. Moving tomatoes to the new red / orange vegetable subgroup, and the associated change in the minimum cup requirements of those two subgroups have the effect of increasing the cost of the final rule relative to the proposed rule. The final rule's reduction in

[63] For purposes of this estimate, reclassifying tomatoes as a "red / orange" vegetable is considered to be one of the final rule's lunch meal pattern changes.

the lunch meal pattern's grain ounce equivalent requirement reduces the cost of the final rule relative to the proposed rule.

Table 18: Alternative 3
Adopt Final Rule Breakfast Meal Patterns; Retain Proposed Rule Lunch Meal Patterns

	Fiscal Year					
	2012	**2013**	**2014**	**2015**	**2016**	**Total**
Food Costs	$22.8	$148.9	$196.6	$653.3	$685.3	**$1,706.9**
Labor Costs	23.2	159.1	191.8	637.6	668.8	**1,680.5**
State AgencyAdministrative Costs	0.1	8.9	9.1	9.4	9.7	**37.1**
Total	**$46.2**	**$316.9**	**$397.5**	**$1,300.3**	**$1,363.7**	**$3,424.5**

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VI. Appendix A

The following tables detail the major steps in the computation of food cost estimates described in the main body of the impact analysis. The tables develop both a baseline food cost estimate and an estimate under the proposed rule.

Table A-1 contains total food and labor cost estimates for the baseline and under the proposed rule. The difference is summarized in the shaded panel at the bottom of the table. That difference is the estimated cost of the rule, as presented in Table 6 in section III.A.1.

Table A-2 shows each of the major inputs into our baseline cost estimate. The first 5 columns give the estimated food cost per school meal served. We inflate each of the meal components by historic and projected changes in food group specific prices to estimate per meal costs through FY 2016. Inflation factors, not shown in Table A-2, are weighted averages, computed from CPI-U data from the Bureau of Labor Statistics. The next set of columns contains projections of meals served through FY 2016. Total baseline costs, in the five rightmost columns of Table A-2, are the product of the estimated costs per meal and FNS projections of the number of meals served.

Our estimate of total cost under the proposed rule is developed in Table A-3. Table A-3 summarizes the steps that we took to estimate a per-meal food cost in FY 2012, the year in which the rule is expected to take effect, and shows our projection of total costs through FY 2016.

Table A-3 resembles Table A-2. It takes the weighted average prices per meal by meal component for FY 2012, projects them through FY 2016 using food group specific inflation factors, then multiplies those inflated per meal figures by FNS projections of meals served. The final estimated cost of meals served under the proposed rule is displayed in the last five columns of the table.

Table A-1: Cost of Proposed Rule – Summary

Cost Effect Summary

	Cost Category		Fiscal Year Costs (millions) 2012[1]	2013	2014	2015	2016	2012 - 2016
Current Rule	**Breakfast**	Food	$240.0	$1,620.8	$1,694.0	$1,761.9	$1,832.5	$7,149.1
		Labor[2]	234.2	1,581.7	1,653.1	1,719.4	1,788.3	6,976.7
	Lunch	Food	843.5	5,629.5	5,860.6	6,089.4	6,327.5	24,750.5
		Labor[2]	823.1	5,493.7	5,719.2	5,942.5	6,174.8	24,153.4
	Total		**$2,140.9**	**$14,325.6**	**$14,926.9**	**$15,513.2**	**$16,123.0**	**$63,029.6**
Final Rule	**Breakfast**	Food	$239.0	$1,606.7	$1,696.1	$2,093.5	$2,177.6	$7,813.0
		Labor[2]	234.2	1,581.7	1,655.2	2,043.0	2,125.1	7,639.2
	Lunch	Food	865.6	5,781.0	6,041.5	6,388.0	6,643.5	25,719.6
		Labor[2]	844.7	5,641.5	5,895.7	6,233.9	6,483.3	25,099.2
	Total		**$2,183.5**	**$14,610.9**	**$15,288.5**	**$16,758.5**	**$17,429.6**	**$66,271.0**
Difference	Food :		$21.1	$137.4	$183.0	$630.3	$661.2	$1,633.0
	Labor :		21.5	147.9	178.6	615.1	645.3	1,608.3
	State Agency Administration[3] :		0.1	8.9	9.1	9.4	9.7	37.1
	Total :		**$42.8**	**$294.2**	**$370.6**	**$1,254.7**	**$1,316.2**	**$3,278.5**

notes:

1. FY 2012 is a 3 month figure. The rule is assumed to take effect at the beginning of SY 2012-2013

2. The SLBCS II estimated that labor costs are 44.5% of total reported SFA costs; food costs are 45.6% of the total. The labor costs shown here are equal to food costs multiplied by (.445/.456) for all cells ezcept breakfast in fiscal years 2012 and 2013. Although we estimate a minimal reduction in food costs for breakfast in FY 2012 and FY 2013, we do not assume a reduction in breakfast labor costs; instead we assume that breakfast labor costs will remain unchanged from the baseline in those years.

3. State agency administrative costs include training and technical assistance to SFAs, monitoring and compliance, and associated reporting and recordkeeping.

Table A-2: Detail of Baseline (Current Rule) Food Cost Estimate – Prices per Meal, Participation, and Total Projected Food Cost

Meal	Food Item	Weighted Average Price (inflated to)					Participation					Total Food Cost ($ millions) for number of months				
		dollar cost per meal					meals served (millions)					3	12	12	12	12
		FY2012	FY2013	FY2014	FY2015	FY2016	FY2012	FY2013	FY2014	FY2015	FY2016	FY2012	FY2013	FY2014	FY2015	FY2016
Breakfast																
	Grades K-12															
	Milk	$0.1830	$0.1867	$0.1905	$0.1944	$0.1983	342	2,253	2,298	2,332	2,367	$62.6	$420.7	$437.8	$453.4	$469.5
	Fruit	0.0353	0.0362	0.0372	0.0382	0.0392	342	2,253	2,298	2,332	2,367	12.1	81.6	85.4	89.0	92.8
	Fruit Juice	0.1110	0.1141	0.1173	0.1206	0.1240	342	2,253	2,298	2,332	2,367	37.9	257.0	269.6	281.3	293.6
	Refined Grain	0.1920	0.1968	0.2017	0.2068	0.2119	342	2,253	2,298	2,332	2,367	65.6	443.3	463.5	482.2	501.6
	Whole Grain	0.0853	0.0874	0.0896	0.0918	0.0941	342	2,253	2,298	2,332	2,367	29.1	196.9	205.8	214.2	222.8
	Meat/Meat Alternate	0.0910	0.0934	0.0959	0.0984	0.1010	342	2,253	2,298	2,332	2,367	31.1	210.4	220.3	229.4	239.0
	Vegetable	0.0046	0.0048	0.0051	0.0053	0.0056	342	2,253	2,298	2,332	2,367	1.6	10.9	11.6	12.4	13.2
	Total K-12	**$0.7022**	**$0.7195**	**$0.7373**	**$0.7555**	**$0.7741**						**$240.0**	**$1,620.8**	**$1,694.0**	**$1,761.9**	**$1,832.5**
Lunch																
	Grades K-12															
	Milk	$0.1841	$0.1878	$0.1916	$0.1955	$0.1995	854	5,531	5,586	5,631	5,676	$157.2	$1,038.8	$1,070.5	$1,101.0	$1,132.4
	Fruit	0.0970	0.0998	0.1026	0.1055	0.1085	854	5,531	5,586	5,631	5,676	82.9	551.9	573.1	594.0	615.6
	Fruit Juice	0.0224	0.0230	0.0237	0.0244	0.0250	854	5,531	5,586	5,631	5,676	19.1	127.4	132.3	137.1	142.1
	Refined Grain	0.1724	0.1790	0.1859	0.1930	0.2005	854	5,531	5,586	5,631	5,676	147.2	990.0	1,038.4	1,087.0	1,137.8
	Whole Grain	0.0173	0.0179	0.0186	0.0194	0.0201	854	5,531	5,586	5,631	5,676	14.8	99.3	104.1	109.0	114.1
	Meat/Meat Alternate	0.3049	0.3133	0.3219	0.3308	0.3399	854	5,531	5,586	5,631	5,676	260.4	1,732.7	1,798.2	1,862.5	1,929.1
	Vegetable	0.1894	0.1970	0.2048	0.2129	0.2213	854	5,531	5,586	5,631	5,676	161.8	1,089.3	1,143.9	1,198.8	1,256.3
	Total K-12	**$0.9875**	**$1.0178**	**$1.0491**	**$1.0814**	**$1.1148**						**$843.5**	**$5,629.5**	**$5,860.6**	**$6,089.4**	**$6,327.5**

Table A-3: Detail of Proposed Rule Food Cost Estimate – Prices per Meal, Participation, and Total Projected Food Cost

Meal	Food Item	Weighted Average Price (inflated to) dollar cost per meal					Participation meals served (thousands)					Total Food Cost ($ millions) for number of months 3	12	12	12	12
		FY2012	**FY2013**	**FY2014**	**FY2015**	**FY2016**	**FY2012**	**FY2013**	**FY2014**	**FY2015**	**FY2016**	**FY2012**	**FY2013**	**FY2014**	**FY2015**	**FY2016**
Breakfast																
	Grades K-12															
	Milk	$0.1814	$0.1853	$0.1900	$0.1932	$0.1971	342	2,253	2,298	2,332	2,367	$62.0	$417.5	$436.6	$450.6	$466.6
	Fruit	0.0353	0.0362	0.0457	0.1623	0.1665	342	2,253	2,298	2,332	2,367	12.1	81.6	105.0	378.6	394.2
	Fruit Juice	0.1110	0.1141	0.1173	0.1206	0.1240	342	2,253	2,298	2,332	2,367	37.9	257.0	269.6	281.3	293.6
	Refined Grains	0.1920	0.1824	0.0955	0.0000	0.0000	342	2,253	2,298	2,332	2,367	65.6	410.9	219.4	-	-
	Whole Grains	0.0853	0.0979	0.1891	0.3188	0.3267	342	2,253	2,298	2,332	2,367	29.1	220.6	434.6	743.4	773.4
	Meat/Meat Alternate	0.0910	0.0934	0.0959	0.0984	0.1010	342	2,253	2,298	2,332	2,367	31.1	210.4	220.3	229.4	239.0
	Vegetable	0.0034	0.0038	0.0047	0.0044	0.0046	342	2,253	2,298	2,332	2,367	1.2	8.6	10.7	10.2	10.9
	Total K-12	**$0.6994**	**$0.7132**	**$0.7382**	**$0.8977**	**$0.9199**						**$239.0**	**$1,606.7**	**$1,696.1**	**$2,093.5**	**$2,177.6**
Lunch																
	Grades K-12															
	Milk	$0.1792	$0.1828	$0.1865	$0.1903	$0.1942	854	5,531	5,586	5,631	5,676	$153.0	$1,011.1	$1,041.9	$1,071.7	$1,102.2
	Fruit	0.0976	0.1003	0.1032	0.1061	0.1091	854	5,531	5,586	5,631	5,676	83.4	555.0	576.4	597.4	619.1
	Fruit Juice	0.0224	0.0230	0.0237	0.0244	0.0250	854	5,531	5,586	5,631	5,676	19.1	127.4	132.3	137.1	142.1
	Refined Grains	0.0785	0.0815	0.0714	0.0000	0.0000	854	5,531	5,586	5,631	5,676	67.0	450.7	399.0	-	-
	Whole Grains	0.0808	0.0839	0.1038	0.2011	0.2088	854	5,531	5,586	5,631	5,676	69.0	464.2	579.7	1,132.2	1,185.2
	Meat/Meat Alternate	0.2747	0.2823	0.2901	0.2982	0.3064	854	5,531	5,586	5,631	5,676	234.7	1,561.2	1,620.3	1,679.0	1,738.9
	Vegetable	0.2801	0.2913	0.3029	0.3144	0.3270	854	5,531	5,586	5,631	5,676	239.3	1,611.4	1,691.9	1,770.5	1,856.0
	Total K-12	**$1.0133**	**$1.0452**	**$1.0815**	**$1.1345**	**$1.1705**						**$865.6**	**$5,781.0**	**$6,041.5**	**$6,388.0**	**$6,643.5**

Approved:

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Audrey Rowe
Administrator
Food and Nutrition Service

Date