



School Lunch Reform: Minimal Market Impacts From Providing Healthier Meals

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Children's diets, including meals consumed in schools, met some but not all of the recommendations for a healthy diet, according to a 1992 School Nutrition Dietary Assessment study about the foods and nutrient content of meals offered to and consumed by students.

While school lunches met or exceeded the required one-third of the Recommended Dietary Allowances (RDA's) for key nutrients, they offered 38 percent of calories from fat and 15 percent of calories from saturated fat—considerably more than the recommendation that 30 percent or less of calories come from fat and less than 10 percent of calories come from saturated fat as adopted in the 1990 *Dietary Guidelines for Americans*. The study also showed that lunches provide too much sodium (an average of 1,479 milligrams)—nearly two-thirds the National Research Council's recommendation for daily intake.

A major effort to improve the nutritional quality of school meals

came in 1994 when USDA launched the School Meals Initiative for Healthy Children, the largest change the National School Lunch Program has undergone since its inception. Supported by legislation in 1994 and 1996, the initiative required USDA to update nutrition standards so that all school meals meet the nutrition recommendations of the 1990 *Dietary Guidelines for Americans*. New regulations implementing the initiative became final in June 1995 and took effect at the beginning of the 1996-97 school year.

At the heart of the proposal was the belief that meals served in the Nation's schools should meet Federal nutrition standards, be palatable to children, be manageable for school foodservice operations, and minimize impacts on agricultural commodity markets. The overall Federal budget was also of concern, so the initiative had to be achieved without increasing costs.

School lunches will undergo many changes in the types of foods offered and the preparation methods as they come into compliance with the new regulations (see box on the National School Lunch Program Today). For example, more vegetables and grain products likely will be offered, while less meat, poultry, fish, and eggs in entrees will be offered. Schools will have flexibility in determining which

approach to meal planning they use to meet the new requirements. While menus will be changing, farmers who produce those foods will feel little impact from the changes because only a relatively small amount of those products are used in school meals.

The findings reported here are based on projected economic and behavioral impacts of the initiative. A model was developed to estimate changes in eating behavior that children were likely to undergo once the Dietary Guidelines were implemented in National School Lunch Program meal offerings. It takes into account foods offered to students, nutrient content of foods, ingredient costs, and USDA's Food Guide Pyramid commodity groups. The results of the model were used to judge likely impacts on agricultural commodities (see box on market-place reactions).

Reform Focuses on Children's' Diet and Food Preferences

USDA's commitment to working with State and local agencies in implementing the *Dietary Guidelines for Americans* in school meals is balanced with its support of U.S. agri-

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cultural production. At times these goals may seem to be at loggerheads because some foods, such as beef, may contain a relatively high amount of fat. Still, beef has become leaner and it also contains essential vitamins and minerals. Its production plays an important role in the agricultural economy. The tradeoffs between these two seemingly competing interests has important implications for agriculture, child nutri-

tion, and Federal food policy. USDA maintains the position that there are no “good” or “bad” foods, but food choices as a whole should be balanced in a healthful diet.

Three alternative scenarios are used to illustrate some of the range of meal options available to schools in implementing the new reforms and also to illustrate the likely economic impacts. Each scenario meets the *Dietary Guidelines for Americans*

and policy constraints, such as the requirement that fluid milk be offered with lunch, that USDA-donated butter be eliminated, and that food costs not increase. In each scenario, the model determines the “optimal amounts” of specific foods. Foods were allowed to vary within food groups (such as high-fat and low-fat bakery products) and across food groups (such as beef, vegetables, and fruits). The optimal

The National School Lunch Program Today

USDA establishes regulations and administers the requirements and implementation of the National School Lunch Program.

Under the law, all students enrolled at participating schools are entitled to take part in the National School Lunch Program. Children from homes with incomes at or below 130 percent of the Federal poverty level (\$20,865 for a family of four in the 1997-98 school year) can receive their lunch free. Children from homes with incomes between 130 and 185 percent of the Federal poverty level (\$29,693 for a family of four) are eligible for reduced-price lunches, for which students can be charged no more than 40 cents. Children in other households pay the full price of the lunch, but these are also subsidized to some extent.

USDA reimburses schools for all lunches that meet program requirements and nutrition guidelines. The current cash reimbursement rates are \$1.89 for free lunches, \$1.49 for reduced-price lunches, and \$0.18 for full-price lunches. USDA also provides administrative support and agricultural commodities.

Participating schools are also eligible to receive additional agricultural commodities that USDA procures from its farm commodity programs.

Until the School Meals Initiative for Healthy Children in 1994, the Federal nutrition requirements for school lunches had not changed significantly since the school lunch program began in 1946. New regulations

designed to improve the dietary quality of school meals and meet USDA's *Dietary Guidelines for Americans* were finalized in 1995. This major regulatory change in the National School Lunch Program is part of an integrated, comprehensive plan for promoting the health of children. School meals are required to meet specific nutrition standards that reflect medical and scientific consensus on proper nutrition as a vital element in disease prevention and long-term health promotion.

The new regulations require schools to have met the Dietary Guidelines by school year 1996-97, unless they received a waiver for up to 2 years. As part of the initiative, USDA published regulations to help schools bring their meals up to date to meet the *Dietary Guidelines for Americans*, which recommend among other things that no more than 30 percent of calories come from fat and less than 10 percent come from saturated fat.

The new regulations also establish a standard for school lunches to provide one-third of the RDA's of protein, vitamin A, vitamin C, iron, calcium, and calories. Schools' compliance with both the Dietary Guidelines and the RDA's is measured over a week's menu cycle.

Schools serve foods that are popular with children in order to maintain high participation rates. Most schools offer hamburgers and cheeseburgers, pizza, hot dogs, chicken nuggets, and peanut butter sandwiches among

their main course choices. Popular side dishes include french-fried potatoes, raw carrots, salad, apples, and peaches. Bread is often offered as a component (such as a hamburger bun) of the most popular dishes, and milk is required to be offered as a beverage.

The new Federal regulations do not require schools to serve—or not serve—any particular foods except that schools are required to offer milk. School meals must meet Federal nutrition requirements, but decisions about which of the available menu planning systems to use, what foods to serve, and how they are prepared are made by local school food authorities.

Schools may choose any one of five systems for their menu planning: NuMenus, Assisted NuMenus, traditional meal pattern, enhanced meal pattern, and other “reasonable approaches.” Both the NuMenus and Assisted NuMenus systems base their planning on a computerized nutritional analysis of the week's menu. The traditional and enhanced meal pattern options base their menu planning on minimum quantities of meat or meat alternate; vegetables and fruits; grains and breads; and milk. The fifth menu option allows schools to develop other “reasonable approaches” to meeting the nutrition requirements, using menu planning guidelines.

amounts of foods were those that met all the nutrition and policy goals while deviating the least from actual consumption patterns observed in school meals.

The first scenario illustrates the impact of minimizing the change in current food offerings to students. The third scenario demonstrates the smallest impacts on the market (such as farm revenue and prices paid to farmers) from providing healthy meals to students.

The second scenario was designed to show how the results could change if lower fat preparation techniques were followed. For example, baked or broiled meat has less fat than does deep-fried meat. Although chicken was used in the second scenario for illustrative purposes, other commodities, such as beef or pork, might show similar

changes if substitutions are made between higher and lower fat alternatives. Menu offerings that meet the new requirements will evolve as products are reformulated to reduce their fat content, new quantity recipes are developed, and additional lower fat products become available.

Children May See Changes in Offerings...

Minimum change in current offerings

Scenario one establishes the amounts of foods from each of the food groups required to meet dietary, cost, and milk requirements with as little deviation as possible from students' current menu

options. Meals likely will contain less meat and more grains. One way to accomplish this is for beef to be used more often in mixtures (such as chili) rather than as separate items (such as roasts or hamburger patties), because there is relatively less beef in the mixtures. Large increases in the amount of bread and other grain products, and fruits are also needed in this scenario. For example, it is expected that cereals and grains will more than double from 45 grams to over 96 grams per day. Likewise, fruits and fruit juices will likely increase 75 percent.

Lower fat preparation

In the second scenario, high-fat chicken preparation techniques (such as fried chicken nuggets) were entirely replaced by lower fat prepa-

Determining How Children and the Marketplace Will React

As one Congressman put it, "...[school lunch is] not nutritious if kids don't eat it." USDA's Economic Research Service, in cooperation with the Food and Nutrition Service (FNS), developed a behavioral model to reflect how children will react to changes in their lunch menu (current school lunch menus were used as the baseline). The model incorporated information on the kinds, amounts, nutrient content, and costs of foods offered in school lunches. Foods and recipes were limited to those actually offered in schools. The behavioral model was designed to allow the types of foods offered to students to vary from baseline food groups and serving sizes under three separate scenarios so long as nutritional, cost, and policy constraints were maintained. Since the palatability of the school meals is important to keep participation levels up, the model minimized

changes in the foods that are popular with children.

Data for the model were obtained from a number of sources. The types of foods offered in lunches were obtained from a 1992 FNS-sponsored survey of 3,550 students in grades 1 through 12 in about 545 schools throughout the country reporting detailed information on the kinds and amounts of foods they consumed over a 24-hour period. Only the portion of data on foods offered to students as part of accredited school lunches was used in this study in order to focus on Federal requirements for the meals. Therefore, all of the effects of changes in the school lunch program reported in this article are based on reimbursable meals and do not include foods purchased à la carte. The 1992 School Nutrition Dietary Assessment survey contained over 600 foods offered in the National School Lunch Program. These

foods were coupled with nutritional content information from USDA's nutrient database and categorized into over 50 food groups, including high-fat and low-fat versions of different categories, such as baked goods and meats.

The three scenarios estimate impacts using 1992-93 market prices for foods available and in use by schools. Food costs came from a nationally representative sample of schools included in the FNS-sponsored School Lunch and Breakfast Cost Study during the 1992-93 school year. The total median reported cost of producing National School Lunch Program meals, which included both direct costs (such as labor, supplies, and utilities) and indirect costs (such as administrative, facilities, services, and employee benefits) was about \$1.63, compared with the \$1.84 Federal subsidy for free meals. About \$0.77 of the \$1.63 was attributed to food costs.

ration techniques (such as baked or broiled chicken parts). Food preparation techniques in other food categories were not modified in order to observe the impacts on other products. This scenario showed that alternative formulations can be made to lunch entrees without removing the foods children enjoy eating. But, changing the preparation technique for only chicken causes greater decreases in the amounts of other meat products, such as beef and pork, unless lower fat preparation techniques are also used on these products.

No change in commodity markets

In the third scenario, menu selections may vary within a commodity group, but the quantities offered for each commodity must remain the same as those currently offered. For example, beef could be consumed alone or in a mixture, such as lasagna, but the total quantity of beef was required to be the same as currently offered. The exception to this rule was that butter would no

longer be used as part of the meal. For many years, butter was a surplus agricultural commodity provided free to schools. However, rising concerns about the adverse health effects of saturated fat and cholesterol eliminated the use of butter in the school lunch program. Since most butter used in school lunches was donated by USDA, and donations to schools have since ceased, we eliminated butter in this analysis (although schools can and do purchase some butter).

Dietary improvements can be made to school lunches without changing the amount of food used from major agricultural commodity groups, but more drastic changes within the various commodity groups (such as using only lean beef products) are needed to achieve this goal than is necessary in the other scenarios. In general, this adaptation required choosing low-fat foods within food groups. Notable exceptions included serving high-fat chicken and potato products, probably due to the need to obtain sufficient calories at a relatively low cost.

Also, food costs became more of a limiting factor in this scenario, so the optimal solution contained few of the more costly foods (such as high-value vegetable products).

...But Small Impacts on Agricultural Markets Expected

With the exception of fluid milk, foods used in the National School Lunch Program account for a minor share of the overall food supply (table 1). Vegetables are one of the most heavily used commodities in the program, and they comprise only about 1.8 percent of the U.S. vegetable market. Likewise, the National School Lunch Program uses just 2.0 percent and 1.6 percent of the U.S. supply of cheese and pork, respectively. As a result, the effects of the program changes on the supply, production, and prices of agricultural commodities are relatively small.

The estimated impacts of only the first and second scenarios on several

Table 1
Foods Provided in the School Lunch Program Are a Minor Component of U.S. Agricultural Markets

Commodity	1993 market size		Predicted amount: Scenario one— Minimum change in current offerings	Predicted amount: Scenario two— Lower fat chicken preparation
	U.S. farm-level production	Amount going to school lunches		
	Million pounds		Million pounds	Million pounds
Butter	1,007	55	0	0
Cheese	6,633	135	53	47
Broilers	19,855	245	125	283
Turkey	4,591	105	53	121
Beef	24,040	485	385	359
Pork	17,268	280	296	280
Fruits and juices	61,055	1,097	1,815	2,234
Vegetables	71,018	1,218	1,307	1,253
Potatoes	34,079	674	376	372
Peanuts	2,050	44	50	50
Rice (million cwt)	180	1	2	2
Wheat (million bu)	2,500	16	30	28

Notes: cwt = hundredweight; bu = bushels. Sources: food supply data are from USDA's Economic Research Service; food amounts in the National School Lunch Program are from USDA's Food and Nutrition Service.

commodity markets are discussed here (see also tables 1 and 2). The third scenario would not affect commodity markets, because the quantities of commodities offered in school lunches were forced to stay the same.

Dairy Sector

Effects differed across the fluid milk, butter, and cheese components of the dairy sector. In all scenarios, the same amount of fluid milk was required, but the amount of cheese was reduced in the first two scenarios (probably due to its fat content), and butter was eliminated entirely in order to reduce fat intake. Hence, the major impacts would be on processed dairy products instead of the fluid milk market.

Total elimination of butter from school lunches was estimated to displace 55 million pounds of butter annually in the 1-billion pound U.S. market (schools are not required to eliminate butter from their menu, but its use is expected to be consid-

erably lower than when it was donated by USDA). Eliminating butter from the National School Lunch Program will minimally affect prices dairy farmers receive, their incomes, and Federal dairy program costs, since virtually all of the butter used in school programs is donated by the Commodity Credit Corporation from stocks acquired under USDA's farm price-support programs. The portion of Commodity Credit Corporation stocks donated to schools is small and could be donated to other institutions or programs.

Under the first two scenarios, cheese consumption declines 82-88 million pounds per year, which is less than a 1-percent drop in U.S. cheese supplies. The reduced consumption of cheese would lower raw milk prices received by farmers 7-8 cents per hundredweight, causing a decline in production and lowering farm revenues about \$166-178 million per year (from a 1990-93 base of \$19.4 billion). Commodity Credit Corporation program costs for dairy products in turn would

increase \$23-25 million. These impacts are small given the size of the market. The substitution of lower fat cheese or other dairy products for some of the products currently used in school lunches could further moderate the impacts.

Broiler and Turkey Sector

Impacts on the broiler market also were estimated to be minimal. In 1993, the National School Lunch Program used about 245 million pounds of broilers, in a U.S. market of 19.9 billion pounds. Under the first scenario, National School Lunch Program broiler use would decline about 120 million pounds, lowering broiler prices to farmers about 1.8 percent and farm revenues 1.2 percent. However, since most broilers in the program are used for high-fat chicken nuggets, broiler use would increase 38 million pounds under the second scenario when lower fat cooking techniques are used. In this case, broiler prices

Table 2
Farm Revenues and Government Expenditures To Change Little With School Lunch Reforms

Commodity	1993 farm revenue \$Billion	Predicted change: Scenario one— Minimum change in current offerings			Predicted change: Scenario two— Lower fat chicken preparation		
		Farm prices Percent	Farm revenue \$Million	Farm program cost \$Million	Farm prices Percent	Farm revenue \$Million	Farm program cost \$Million
Cheese (milk equivalent)	19.4 ¹	-0.6	-166	23	-0.6	-178	25
Butter (milk equivalent)	19.4 ¹	0	0	0	0	0	0
Broilers	11.0	-1.8	-134	0	.4	19	0
Turkey	2.9	-2.1	-36	0	.5	4	0
Beef	28.3	-.9	-143	0	-.9	-103	0
Pork	10.7	.2	11	0	0	0	0
Fruits	10.2	.1	124	0	.2	200	0
Vegetables	9.4	0	12	0	0	5	0
Potatoes	2.0	-.1	-20	0	-.1	-20	0
Peanuts	1.0	.1	1	0	.1	1	0
Rice	1.3	.6	9	-8	.5	7	-6
Wheat	7.3	.7	45	-35	.7	45	-35

Note: ¹Total farm receipts from milk.

would increase 0.4 percent and farm revenues would rise 0.2 percent.

As with broilers, the use of turkey in the National School Lunch Program is small (105 million pounds) relative to the total U.S. market of about 4.6 billion pounds. Under the first scenario, turkey consumption would decline by 52 million pounds, driving farm-level prices down about 2 percent and reducing farm revenues about \$36 million, less than 0.01 percent of current revenues. In the second scenario, turkey consumption would increase 16 million pounds, increasing prices 0.5 percent and farm revenues \$4 million.

Fruit and Vegetable Sectors

Schools use fruits and vegetables in a variety of forms, including fresh, frozen, canned, and as ingredients in commercially processed mixtures. Despite the relatively large increases in the use of fruits and vegetables under the School Meals Initiative for Healthy Children, the impact on the markets for these commodities would be minimal. In the first scenario, fruit use would increase 718 million pounds (65 percent), but farm-level prices would increase only 0.1 percent and farm revenues would increase \$124 million in the \$10.2-billion market. The second scenario would increase fruit consumption 1.1 billion pounds (104 percent), with farm revenues increasing \$200 million.

Potato consumption in the school lunch program would decrease substantially under the first two scenarios (about 45 percent), since the majority of potatoes previously used in school meals are deep-fried and contain a lot of fat. French fries likely will be offered less often under the program reforms. Even

so, the impact on potato prices would be minimal (0.1 percent) and farm revenues would decrease only \$20 million. However, as illustrated in the second scenario for chicken, if the schools prepare potatoes in a relatively lower fat manner, the adjustments would help moderate the market impacts.

The use of other types of vegetables in the National School Lunch Program is expected to be increased under the reform measures. Vegetable use (excluding potatoes) would increase by about 89 million pounds (7 percent) annually under the first scenario and 35 million pounds (3 percent) in the second scenario. In the 71-billion pound U.S. vegetable market, this is not likely to affect prices, but farm revenue would increase between \$5 million and \$12 million due to increased vegetable sales.

Preliminary Evaluation of School Lunch Reform Mixed

As USDA was refining its School Meals Initiative for Healthy Children, it also began to study the reforms. USDA's Food and Nutrition Service sponsored a survey of State officials responsible for implementing the program, targeting directors of school food authorities participating in a demonstration project of the NuMenu system (one of the options available to the school administrators, where lunch menus and their dietary quality are planned with the assistance of computer software that computes the nutritional content of the lunch).

While the results are preliminary (only 17 school food authorities had fully or partially implemented the NuMenu system at the time of the survey) and should not be viewed as nationally representative, some common threads were revealed. To meet program requirements, the

directors reported using more fresh fruits and vegetables and increasing their use of lower fat entrees and products. Some reported increasing portion sizes in middle and high school menus and using more foods high in carbohydrates in elementary menus to meet caloric needs. In fact, most directors in the demonstration project reported having difficulty meeting the caloric standard for lunches, probably due to the decreases in calories from fat and saturated fat (fat contains 9 calories per gram, while protein and carbohydrates contain 4 calories per gram). Over half of the directors reported difficulty meeting the limits on total fat and saturated fat. Some directors found that meeting the requirements for vitamin A and iron was difficult for some age groups, although this was less problematic than meeting caloric needs.

The opinions and attitudes of those implementing the National School Lunch Program in schools were also surveyed. Most directors of school food authorities and their staffs were either very or somewhat positive about the NuMenu system. They were pleased that the program ensured a healthful meal, provided an accurate assessment of nutrient content, and provided flexibility in the way meals could be served. There were many concerns, however, about the time and labor required to implement the system. For example, directors expressed serious concerns about the record-keeping necessary in performing weighted averages of all the nutrients in all the food items for all the schools in each jurisdiction.

Minor adjustments probably will be needed to further refine the regulations. Still, it looks promising that school lunches across the Nation will continue to improve as our knowledge of nutrition require-

ments advances. The quantitative fat limits in the 1990 *Dietary Guidelines for Americans* were quite new at the time the School Nutrition Dietary Assessment Study collected data and identified the need for selective improvements in a program that was successful at meeting target RDA nutrient levels. Federal, State, and local governments and private industry are responding by serving healthier lunches to students, educating them on the importance of long-term nutrition and health, and actively promoting sound eating habits.

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