

Short communication

Exploring implementation of the 2010 Institute of Medicine's Child and Adult Food Care Program recommendations for after-school snacks

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Abstract

Objective: The aim of the present study was to explore the implementation of nutrition recommendations made in the 2010 Institute of Medicine (IOM) report, *Child and Adult Care Food Program: Aligning Dietary Guidance for All*, in school-based after-school snack programmes.

Design: A descriptive study.

Setting: One large suburban school district in Minneapolis, Minnesota, USA.

Subjects: None.

Results: Major challenges to implementation included limited access to product labelling and specifications inconsistent with the IOM's Child and Adult Care Food Program (CACFP) recommendations, limited access to healthier foods due to current school district buying consortium agreement, and increased costs of wholegrain and lower-sodium foods and pre-packaged fruits and vegetables.

Conclusions: Opportunities for government and industry policy development and partnerships to support schools in their efforts to promote healthy after-school food environments remain. Several federal, state and industry leadership opportunities are proposed: provide product labelling that makes identifying snacks which comply with the 2010 IOM CACFP recommended standards easy; encourage compliance with recommendations by providing incentives to programmes; prioritize the implementation of paperwork and technology that simplifies enrolment and accountability systems; and provide support for food safety training and/or certification for non-food service personnel.

Keywords

Nutrition recommendations
After-school snacks
School nutrition policy

The US school food programmes began extending into the after-school hours in 1998, when federal subsidies added reimbursements for snacks provided to students during after-school enrichment activities like homework assistance programmes^(1,2). After-school snack programmes fall under federal purview of the US Department of Agriculture (USDA). Schools operating longer than the traditional school day may be eligible for after-school snack reimbursement through the Child and Adult Food Care Program (CAFCP) or the National School Lunch Program (NSLP). Nutrition standards for after-school snacks are the same for both CAFCP and NSLP, and have focused on food safety, minimum portion sizes and food groups^(2,3). Although recommendations with a significant emphasis on obesity prevention have been established related to the food environment during the school day⁽⁴⁾, guidance pertaining to snacks and meals served after school hours has only

been recently released⁽⁵⁾. The extent to which snacks that comply with the revised recommendations are available and affordable is unknown.

Children at higher risk for obesity, including those in poverty or minority groups, constitute a significant proportion of participants in after-school programmes^(6–8). For example, during the 2009 school year, NSLP-funded snack programmes served about 180 million snacks in US after-school settings representing an average daily distribution of over 1 million snacks⁽⁹⁾. Ninety-one per cent of these snacks were served by programmes having at least 50% of students who qualify for free and reduced-price lunch benefits⁽⁹⁾. CACFP also serves snacks to youth in other after-school settings like YMCA and other park and recreation centres. Both NSLP and CACFP serve high-needs programmes that are termed 'area eligible' and all snacks are reimbursed at the free rate, regardless

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of individual student eligibility for free or reduced price lunches⁽¹⁰⁾. Area eligible designation is of particular benefit to programmes because it increases funding and simplifies programme administration for school food service. Conversely, snacks served in after-school care programmes that are not area eligible (<50% of students qualify for free and reduced-price lunch benefits) are reimbursed at the free, reduced price and paid rate depending on each individual's eligibility for free or reduced-price meals. This means non-area eligible programmes must maintain a roster or sign-in sheet and process for reimbursement.

The purpose of the present descriptive study was to explore the feasibility of developing an after-school snack menu that adheres to recommendations which reflect current nutritional science. Specifically, the aim of the present study was to identify foods and beverages that adhere to the 2010 Institute of Medicine (IOM) CACFP⁽⁵⁾ recommendations for snacks served after school and local school district logistical and budgetary parameters for after-school homework programmes. This practical examination is important because schools are under pressure to improve the whole school food environment, including after school⁽¹¹⁾. This work is additionally important because after-school programmes are growing steadily in the USA and many are designed to reach underserved children where health disparities, including overweight and hunger, coexist^(12,13).

Methods

The present study was guided by the 2010 IOM CACFP report on nutrition recommendations for after-school snack programmes serving two small snacks for middle-school students⁽⁵⁾, reimbursement guidelines for the NSLP's after-school snack programme^(2,14), the Minnesota Department of Health safe food handling guidelines, and local school district wellness policy and budget criteria for one large suburban school district north of Minneapolis, Minnesota, USA⁽¹⁵⁾. The school district tasked the study investigators with 'aggressively identifying healthy, reimbursable snacks'. These parameters are more fully described below.

Snack reimbursement guidelines

For the present study, the NSLP reimbursement rates and criteria for reimbursement of eligible food items were used^(2,3). For instance, to qualify for snack reimbursement in a school-based after-school programme, snack foods must be served in an enrichment programme and each student must receive a combination of two different food components: fruit or vegetable, grain, milk, and meat or meat alternative. Minimum portion sizes also have to be in accordance with reimbursement criteria in order to qualify for payment⁽¹⁴⁾. The present study focused on evaluating the costs of the small snack pattern. The IOM report also provides recommendations for a large snack pattern for school-aged children in high-needs areas⁽⁵⁾.

Child and Adult Care Food Program nutrition recommendations

Because the current CACFP nutrition requirements are two decades old, the USDA commissioned the IOM to make recommendations based upon a review of the most up-to-date health and nutrition science. As a result, the 2010 IOM report, *Child and Adult Care Food Program: Aligning Dietary Guidance for All*, makes food-based recommendations meant to result in meals and snacks that meet nutrient criteria identified in the 2010 Dietary Guidelines for Americans⁽¹⁶⁾. The 2010 IOM CACFP report emphasizes a better control of calories, more fruits and vegetables and a greater variety of vegetables, more whole-grain-rich foods and fewer refined-grain foods, milk choices limited to non-fat and low-fat, and increased emphasis on limiting foods high in solid fats and added sugars⁽⁵⁾. Recommendations vary by age. The 2010 Dietary Guidelines for Americans criteria include no more than 25–35% of total energy from fat, less than 10% of total energy from saturated fat, no *trans* fat and less than 35% of total energy from sugar, except for fruit. Table 1 highlights the current requirements and the new recommendations⁽¹⁶⁾.

State health and school criteria

Serving snacks after school means no food safety certified professionals are on site (i.e. food service employees). In order to adhere to the Minnesota Department of Health food safety standards, snacks could not be prepared or heated before serving to students. In addition, school-based after-school homework programmes are frequently held in the school library and/or media and technology centre where food spills are a concern. Therefore, snacks were excluded if they had to be cooked, reheated or prepared; requiring mostly single-serve self-contained snacks. Child Nutrition Program managers requested that up to \$US 0.45 per child be spent on a two-component snack. The rationale provided for this cost parameter included food, labour and programme administration costs and non-area eligible recordkeeping and reimbursements. For the period of 1 July 2009 to 30 June 2010, federal reimbursement payments were made for a two-component snack served after school at full paid rates of \$US 0.06, reduced-price rates of \$US 0.37 and free rates of \$US 0.74 (higher for Alaska and Hawaii)⁽²⁾. These food safety, logistical and budgetary parameters combined required all products to be low cost and generally pre-packaged.

Collection of potential products for menu development

The following efforts were made to locate snack and beverage items that might potentially adhere to the pre-determined criteria to serve to students in an after-school snack programme. To begin, the school district Child Nutrition Program manager provided a previously used contact list of customer representatives. In addition, researchers attempted to identify new products through

Table 1 CACFP dietary guidelines for after-school snacks

Age	Proposed CACFP standards			Current CACFP standards			
	5–13 years			6–12 years			
	2 small snacks. Variety of components specified for the week			Serve 2 of the 4 components for a reimbursable snack			
Policy Component/serving size/number per week	Component	No. allotted per week	Serving size	Component	No. allotted per week	Serving size	
Component specifics	Grain/bread	2	1 oz equiv.	Grain/bread	–	1 oz equiv.	
	Lean meat or meat alternative	2	1 oz equiv.	Meat/meat alternative	–	1 oz equiv.	
	Milk	2	$\frac{1}{2}$ cup	Milk	–	1 cup	
	Fruit	2	$\frac{1}{2}$ cup	Fruit/vegetable	–	$\frac{3}{4}$ cup	
	Orange vegetable	1	$\frac{1}{2}$ cup				
	Non-starchy vegetable	1	$\frac{1}{2}$ cup				
	Component	Recommended requirements and specifications			Component	Current requirements	
	Grain/bread	At least half must be wholegrain-rich, additional whole grains are encouraged, grain products high in solid fats and added sugars are limited to control calories and saturated fat, high-sodium grains are also limited. Non-wholegrain grain products must be enriched			Grain/bread	Breads and grains must be made from wholegrain or enriched meal or flour. Cereal must be wholegrain or enriched or fortified	
	Lean meat or meat alternative	Some types are limited to control calories, solid fat and sodium			Meat/meat alternative	None listed for snacks	
	Milk	Must be non-fat or low-fat (1 %). Flavoured milk must be fat-free and is allowed only for at-risk after-school programmes			Milk	Fluid milk	
Fruit	Fruits containing added sugars are limited. Juice is an option only if it is 100% fruit juice and has not been served at another meal or snack. Fruit refers to fresh, frozen, canned or dried choices that meet specifications			Fruit/vegetable	Fruit or vegetable juice must be full-strength. Cannot be served when milk is the only other snack component		
Orange vegetable	Bright orange/yellow; sodium content is limited						
Non-starchy vegetable	Dark leafy greens, legumes; sodium content is limited						
Selected nutrient specifics	Calories (kcal/kJ)	126/527					
	Sodium (mg/dl)	<159					

CACFP, Child and Adult Care Food Program.

direct vendor in person, phone and email contacts, website searches, and attending a Minnesota State School Nutrition Association resource exposition.

Results and discussion

The top half of Fig. 1 shows the results of the process to identify the breadth of product lines available. Multiple attempts to contact vendors provided by the study school district resulted in 50% of contactable vendors. Among those vendors (*n* 22), three were excluded because of the type of product available (i.e. bulk, meal items) resulting in nineteen approachable product line vendors.

The bottom half of Fig. 1 illustrates that nearly 300 products were initially identified from available product line representatives for potential inclusion in an after-school snack menu. Twenty-two per cent (*n* 62) of these were excluded because they did not have complete nutrition labelling information. Then, 20% (*n* 44) were eliminated because they were too high in calories, fat or sodium. Beef

jerky, some string cheeses and wholegrain crackers and chips were examples of snacks identified that did not meet these criteria. Among the list of products that met the nutrition criteria, over 50% (*n* 90) were excluded from the final menu because of cost. Single-serve fruit cups and fresh cut vegetables with dips were commonly identified as unaffordable, for the study conditions, at about \$US 0.40 each. The final eighty-eight products were reduced to thirty obtainable items. The loss of over half of these products was a result of lack of availability for the school district because of the existing buying consortium agreement and duplicate products; for example, pineapple juice available from multiple companies.

A final product list containing one fresh orange vegetable, two fresh fruits, two milk, eight meat alternatives and fourteen wholegrain components is provided in Table 2 and highlights general product cost. There are noteworthy findings. First, only one vegetable fit these combined nutrition standards, food safety, school and district cost and logistical parameters. Second, fresh apples, pears and carrots were relatively inexpensive and obtainable during

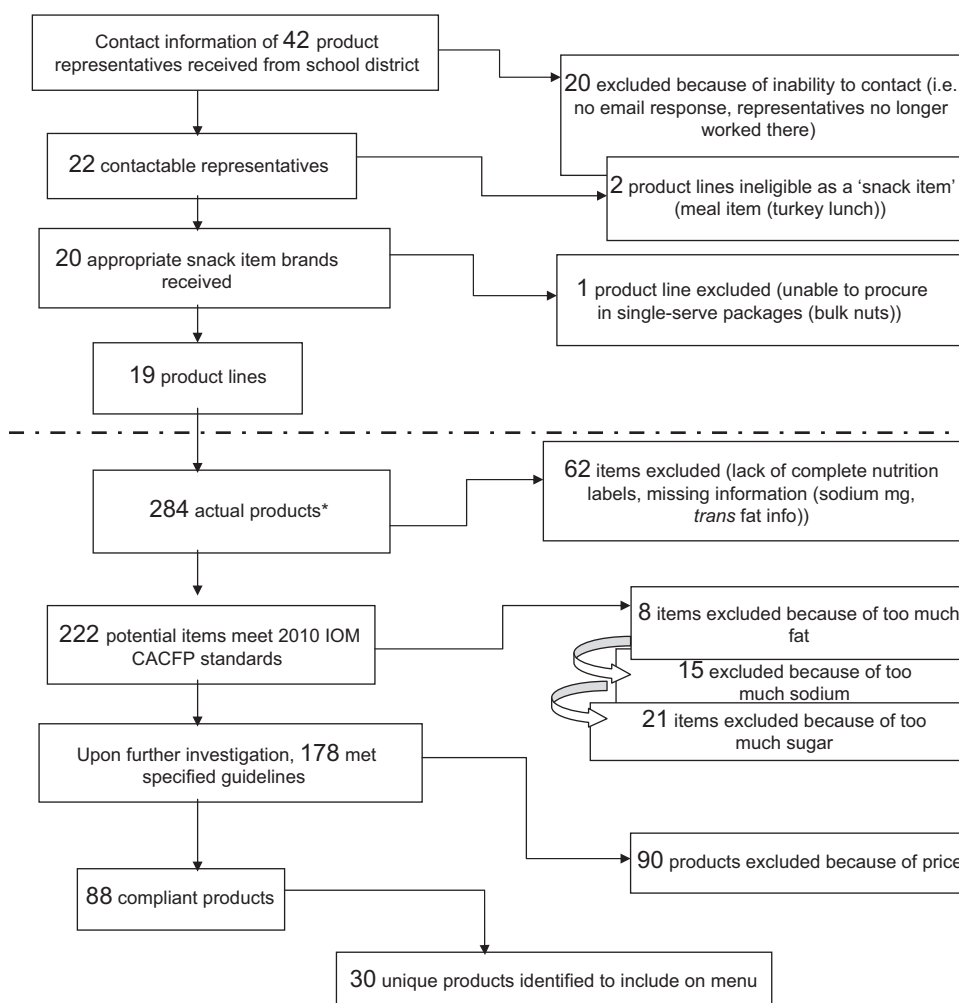


Fig. 1 Flowchart of included and excluded snack items for possible menu development (IOM, Institute of Medicine; CACFP, Child and Adult Care Food Program); *excludes products obviously not adhering to previously listed criteria

Table 2 Foods and beverages identified for after-school snack programmes sorted by cost

Product brand name	Product name	Serving size	Serving cost (\$US)*	USDA pattern equivalent
Grimway	Baby carrots	1.6 oz	0.09	1 FV
Dean Foods	Skim milk	8 oz	0.14	1 Milk
Dean Foods	Fat-free chocolate milk	8 oz	0.15	1 Milk
Frito-Lay	Multi-grain Harvest Cheddar Sunchips	1 oz	0.16	1 WG
Frito-Lay	Apple Cinnamon Oatmeal to Go Bar	1.4 oz	0.17	1 WG
Washington	Golden Delicious apple	1 medium	0.18	1 FV
	Fresh Bartlett pear	1 medium	0.19	1 FV
Keebler-Kellogg's	Bug Bites Graham Crackers	1.1 oz	0.19	1 WG
Azar Nut Co.	Honey Roasted sunflower seeds	1 oz	0.22	1 MA
Land O lakes	Lite Mozz String Cheese Sticks	1 oz	0.22	1 MA
Land O Lakes	Colby-Jack Cheese Sticks	1 oz	0.22	1 MA
Dakota Gourmet	Lightly salted Pepitas (Pumpkin Seeds)	1 oz	0.22	1 MA
Dakota Gourmet	Chili Limon Pumpkin Seeds	1 oz	0.22	1 MA
JSB Muffintown	Blueberry wholegrain, reduced fat Smart Choice muffin	2 oz	0.23	1 WG
J&J	Baked whole wheat pretzel	2.5 oz	0.24	1 WG
Pierre Foods	PB&J Grape whole wheat	2.2 oz	0.24	1 MA
				1 WG
Super Bakery	Mini loaf banana whole wheat	2 oz	0.26	1 WG
Upstate Farms	Strawberry banana Yogurt	4 oz	0.26	1 MA
Upstate Farms	Nonfat Raspberry Yogurt	4 oz	0.26	1 MA
Capri Sun	100 % Fruit Dive Wave juice	6.75 oz	0.28	1 FV
Capri Sun	100 % Apple Splash Juice	6.75 oz	0.28	1 FV
Capri Sun	100 % Berry Breeze Juice	6.75 oz	0.28	1 FV
Dole	100 % Pineapple Juice	6 oz	0.30	1 FV
Kellogg's	Frosted Whole Grain Miniwheats	1 oz	0.30	1 WG
Kellogg's	Whole Grain Strawberry Poptart	1.76 oz	0.30	1 WG
Kellogg's	Low Fat Crunchy Granola Blends pouch	1.5 oz	0.31	1 WG
General Mills	Fruity Cheerios Cereal on the Go pouch	0.88 oz	0.31	1 WG
General Mills	Rice Chex Bowlpak (gluten free)	0.69 oz	0.31	1 Bread
Kellogg's	Reduced Sugar wholegrain Apple Jacks cereal	1 oz	0.31	1 WG
General Mills	Whole Grain Snack chex mix ched original	1.75 oz	0.32	1 WG

USDA, US Department of Agriculture; FV, fruit or vegetable; WG, wholegrain; MA, meat or alternative.

*Prices are vendor estimates only and vary considerably by season, economy, district, contract, etc.

this time period. A USDA report ranking the average price per edible cup equivalent of fresh and packaged fruit and vegetables (2008 prices) is consistent with our selections⁽¹⁷⁾. A diverse offering of meat alternatives were available, including seeds, at mid price range using study criteria. A considerable variety of whole grains were also available, but generally the most expensive food component using parameters for the present study.

Lessons learned implementing the 2010 Institute of Medicine Child and Adult Care Food Program recommendations for after-school snacks

A number of lessons were gleaned from this menu development process that may hinder a school's ability to easily respond to demands to improve the food environment. This section documents the most critical challenges to the present study.

Limited access to product labels

The first major challenge was gaining access to nutrition labels. There were difficulties obtaining nutrition information from product representatives as well as receiving detailed nutrition labels. When product labelling was available, often specifications were inconsistent with the 2010 IOM CACFP recommendations. Some of the product

information sheets obtained listed calories and/or reimbursement information; however, these details did not reveal sodium in milligrams, proportion of added sugars or lacked the labelling as wholegrain. For example, the labels often lacked sugar by percentage of calories, although sugar by percentage of weight was commonly detailed. This challenge was disconcerting since mandatory nutrition labelling laws have been in effect since 1994⁽¹⁸⁾.

Buying consortium limitations

Another area of difficulty encountered led to the surprising limitation of the ability to try new foods. Although buying through a consortium can be cost-effective for school districts, it added a layer of difficulty in acquiring new eligible products for the present study. Using a single distributor as part of a buying consortium led to the exclusion of many products and brands, because the distributor may only carry contracted brands. Typical of a cooperative buying agreement, the district used a bidding process for food purchasing. Schools using this process estimate how much product they will use throughout the year, and the distributor only stocks the necessary items. The school contracts to buy the quantity of product it estimated the year prior. The distributor only carries products negotiated in the bid. Limited warehouse space

and the request from only one district (of sixty-six member districts) make the task to obtain, store and ship new products challenging for the distributor. A report by the School Nutrition Association (2008) identifies that 31% of large school districts, nationwide, are in a food buying consortium⁽¹⁹⁾.

Food, labour and administration costs

Food, labour and administration costs continue to challenge school food service directors' ability to meet recommendations to provide fresh fruit and vegetables, wholegrain or lower-sodium products. Half of the products identified that met the nutrition criteria were excluded because of the increased price of the more healthful items. For example, often the wholegrain products had a higher price than the regular sugar and white flour content version. Single-serve containers of cut fruits and vegetables were least accessible due to cost. Food and labour costs have consistently been identified as a major challenge to improving school food environments^(19,20).

Study benefits and limitations

Generating a list of healthy snacks has many benefits to a school district. The inventory can be used for grab-and-go breakfast items, staff meetings, field trips, sporting events and approved food-related fundraising. The current exploratory study has limitations to acknowledge. Reproducing these study results is unlikely, even within the same school district. Distributor contracts, price of products, product reformulation and budgetary constraints vary considerably by season and year and across districts and contract periods. However, the process and lessons learned may be relevant to other CACFP-supported meal and snack programmes (i.e. early child care, older adult care). Specifically related to the cost limitations, this NSLP-funded after-school programme did not meet the high-needs area eligible criteria. Therefore, lower reimbursement and more administrative costs were a factor. Higher priced snack items like fruit and vegetable cups may be obtainable if the free reimbursement category was guaranteed for each participant (i.e. area eligible). The present study was also time intensive. The menu development took over 65 hours of labour, a resource programmes can rarely spare.

Conclusion and policy implications

After-school snacks are one element of the broader food environment that exists at schools and may be especially beneficial for millions of weight-vulnerable children. After-school programmes are widespread, growing and have yielded positive youth outcomes (i.e. improved grades, reduced risky behaviours, improved diet and activity patterns, etc.)^(21,22). Identifying snacks consistent with current evidence-based dietary recommendations to serve in school-based after-school programmes is doable;

however, many challenges became evident. Lessons learned from the present study highlight the need for: (i) food label formats to be consistent with current evidence-based recommendations for easy evaluation or implementation of a compliance designation system; (ii) model language in cooperative buying contracts that allows reasonable flexibility for schools to try new products within the binding period; and (iii) adoption of public policy that logistically and financially supports after-school snack programmes to obtain compliance with the 2010 IOM CACFP recommendations.

Recent US federal policy addresses some of these after-school-specific concerns. For example, the Healthy, Hunger-Free Kids Act of 2010 includes provisions for simplifying all food support programmes' application and accountability processes⁽²³⁾. This US federal law also includes a \$US 0.06 school lunch incentive for schools in compliance with enhanced nutrition standards and provides a model for states to consider. These initiatives may free up some funds to be applied towards the higher costs associated with serving wholegrain and lower-sodium foods and more fruits and vegetables. The 2010 IOM CACFP report identifies that adopting standards that produce healthier meals and snacks comes with additional costs⁽⁵⁾. Costs of compliance with recommended nutrition standards for snacks for 5–13-year-olds are estimated to decrease by 13%, but increase by 26% for programmes serving 2–4-year-olds and 31% for those serving 14–18-year-olds⁽⁵⁾. Assuring overall programme integrity is an especially unique challenge for after-school snack programmes that adds another layer of complexity to the cost of programme administration. Often, food service employees have gone home and oversight (i.e. food safety, snack distribution, recordkeeping) is provided by untrained teachers or other staff contributing to a reliance on pre-packaged snacks and requiring extra time input by food service employees to obtain accurate counts for reimbursement⁽²⁴⁾. Results of a study involving twenty-seven food service directors across fifteen states recommend that a comprehensive calculation of programme costs (i.e. food, labour, administration and training) be included in the federal reimbursable formula⁽²⁴⁾.

Opportunities for federal and state government and industry policy leadership and partnerships to support schools in their efforts to promote healthy after-school food environments remain.

- Federal: expand the federally supported voluntary Child Nutrition Labeling Program⁽²⁵⁾ to make nutrition comparisons and/or compliance designations easy.
- State: prioritize the implementation of technology that simplifies enrolment and accountability systems, especially for non-area eligible programmes. Partner with University Extension to develop and deliver food safety training and/or certification for non-food service personnel.

- Industry: support the adoption of a universal compliance designation system, sponsor training programmes, incentivize compliance purchases and develop buying consortium best practices that allow compliant snack purchases during contract periods.

Finally, the *White House Task Force on Childhood Obesity Report to the President* recognizes the unique opportunities to promote the dietary habits of youth in after-school programmes⁽²⁶⁾. Investigation of factors influencing adoption of IOM CACFP recommendations in other food support programmes like early child care and education programmes and older adult centres are needed.

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