



K-12 School Food Service Staff Training Interventions: A Review of the Literature

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ABSTRACT

Background: School food service professionals are vital to implementing national nutrition standards in school meal programs. Appropriate and effective training for these professionals may be one key to producing healthful meals that students are excited to eat and also meet United States Department of Agriculture (USDA) nutrient guidelines. A systematic literature review was conducted to understand the scope of interventions conducted with food service staff.

Methods: PubMed, Web of Knowledge, and Science Direct databases were searched for articles detailing school food service training interventions in K-12 school settings within the United States.

Results: Of 2,341 articles retrieved, 17 articles describing 14 food service training interventions met the inclusion criteria. While food service staff training was an important component of many comprehensive school health and school meal interventions, there were few studies that specifically addressed school food service staff trainings. While some best practices can be concluded from the current literature, major gaps in knowledge about effective school food service training interventions and validated research tools remain.

Conclusions: As new professional standards are mandated by the USDA, a more thorough evaluation and understanding of best practices is vital to maximize the effectiveness of food service staff training.

Key Words: school meals, food service, continuing education, staff training

BACKGROUND

The National School Lunch Program (NSLP) and School Breakfast Program (SBP), authorized by the United States Department of Agriculture (USDA) Food and Nutrition Services (FNS), provide affordable meals for 31.6 million children in the U.S. each day.¹ Children who participate in the school breakfast and lunch programs consume more than half of their daily calories at school.² The USDA FNS sets forth guidelines for these meals, specifying the number of required servings in each food group and limiting the amount of sodium, fat, saturated fat, and calories for each meal.³ The vast majority of these meals do not meet all specified nutrient guidelines. In the 2009 School Nutrition Dietary Assessment Summary, researchers found that only 6% of assessed schools met all of the nutrient standards.⁴

School Food Authorities (SFAs) are responsible for operating school nutrition programs in compliance with USDA FNS meal guidelines.⁵ Food service professionals under each SFA are integral to the process of implementing USDA school meal guidelines. Appropriate and adequate training and education for school food service professionals may be one key to meeting USDA school meal guidelines and providing healthier meals overall.^{6,7} School food service programs with directors that have a nutrition related degree, have completed additional food service training, or work with nutrition education programs like Team Nutrition, are more likely to serve healthier meals in general.⁸ In addition, meal programs with certified food service program directors are more likely to adhere closely to nutrition policies in practice.⁹ Furthermore, new USDA minimum training requirements and professional standards for school food service professionals will be implemented in the 2014-15 school year.¹⁰ In anticipation of these new

requirements, developing the best practices for training and continued education for food service staff and managers becomes even more vital. Understanding the most effective implementations of staff training will allow strategic and productive use of training resources to improve the quality and nutrition of school meals.

To our knowledge, no comprehensive review of food service training interventions exists. To facilitate the development of effective future training models for school food service staff, a thorough literature review is necessary to answer the question, “What, if any, school food service staff training methods currently in practice have been thoroughly evaluated and how effective are these methods?” This systematic review of literature aims to synthesize existing research about school food service training interventions in order to answer this research question while identifying best practices and areas for future research.

METHODS

Researchers adhered to the systematic review protocol outlined in the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) Statement. This peer reviewed statement, developed by a team of 29 research professionals outlines specific protocol for completing reviews and meta-analyses to enhance the strength and reliability of this type of reporting. The PRISMA Statement includes a 27 item checklist and flow diagram to be applied in the systematic review with the aim of eliminating bias and ensuring transparency in the review process.¹¹ In February 2014, the research databases PubMed, Science Direct, and Web of Knowledge were searched for the following terms in various combination: school, food service, foodservice, food worker, nutrition program, training, and continuing education. Search results were combined and duplicated results eliminated. Titles and abstracts of the results were

screened and inapplicable articles eliminated. The full text of all remaining articles eligible for inclusion were obtained and further evaluated for inclusion criteria.

Articles included in the final literature review were intervention based studies conducted in a U.S. K-12 school setting and published in peer reviewed journals between January 1990 and February 2014. Studies were excluded if they were: published prior to 1990, did not detail a school food service staff training, were not intervention based, were not original research, or did not take place in a U.S. K-12 setting (Figure 1).

Figure 1

The two authors extracted data based upon sample size, type of intervention, food service components of intervention, training methods, training areas addressed, and outcomes. The extracted data was evaluated to identify trends in current practices and evaluation of intervention as well as effective intervention approaches. The quality of the articles was assessed by evaluating methodology and outcomes, as they related to school food service interventions.

RESULTS

A total of 2341 unique articles were identified for possible inclusion in initial database searches (Figure 1). After evaluation of titles and abstracts, 93 articles were selected for full text evaluation. From those 93 articles, 74 articles did not meet inclusion criteria and were excluded. Reasons for exclusion included study location outside of the U.S. (N=1), settings other than a K-12 school (N=12), not intervention based (N=28), not detailing staff training (N=15), not having a staff training component (N=15), not original research (N=1), and being published prior to 1990 (N=4). A total of 17 articles describing 14 interventions were included in the final literature

review (Table 1). The majority of articles (N=9) described comprehensive school health interventions with a specific food service component that included food service staff training as an important part of the overall intervention.¹²⁻²⁰ Six studies assessed school food service interventions or school food environment interventions that included a component of staff training²¹⁻²⁶ and just 2 studies were specific to evaluating a school food service staff training program.^{27,28} In assessment of experimental methodology, none of the studies randomized participants.

Table 1

Comprehensive School Health Interventions

The 6 comprehensive school health programs described in the 9 articles involved various components, including physical activity interventions, classroom curriculum, and community and parent involvement, in addition to food service intervention.¹²⁻²⁰ The duration of the interventions ranged from 1 to 3 years and the sample sizes varied from 4 schools¹³ to 96 schools.^{15,16,17} The primary aim of the food service interventions were to bring menus into closer alignment with USDA guidelines (1 study),¹⁴ decrease fat content in meals (5 studies),¹²⁻¹⁹ decrease saturated fat (1 study),^{18,19} decrease sodium content of meals (1 study),¹⁵⁻¹⁷ increase variety and quality of fruits and vegetables offered (2 studies),^{12,20} limit calories from sweets and desserts (1 study),¹² and increase fiber content of meals (1 study).¹² Most staff training in these comprehensive interventions included initial training (2 to 6 hours) and follow up from the intervention team in the form of monthly or bi-yearly booster trainings or kitchen visits. Three of the studies utilized staff interviews to assess implementation and attitudes regarding the intervention,^{14,15,19} while 5 of the 6 studies included menu and recipe analysis to assess food

service intervention outcomes.¹³⁻²⁰ One study did not specify assessment protocol or outcomes.¹² Results of staff interviews indicated that staff felt involved with and positive about the intervention¹⁴ and confident in their abilities to implement change.²⁰ Nutritional aims achieved included lowering fat and saturated fat content^{13,15-19} and increasing fruit and vegetable offerings.²⁰ However, there was mixed successes in decreasing sodium.^{15,17}

Food Service and Food Environment Interventions

Aims of the 6 school food service interventions were similar to aims of the food service components reviewed in the comprehensive school health interventions: decrease fat content (2 studies),^{21,25} decrease sodium content (3 studies),^{21,25,26} and increase overall healthfulness and adherence to USDA guidelines (2 studies).²²⁻²⁴ The sample sizes of the interventions ranged from 2 schools²² to one large school district encompassing 1700 schools.²⁴ These programs differed widely in their implementation of staff training. Workshops ranged from 2 hours to 3 days in duration and 2 of the interventions included chefs training food service staff by working alongside them for an extended period of time. One intervention incorporated staff interviews as an evaluation measure,²³ 1 measured plate waste,²¹ and 5 of the 6 relied on menu analysis to assess intervention success.^{21-23,25,26} These interventions generally achieved their menu and dietary goals with the exception of sodium reduction, which again had mixed results.^{21-23,25,26}

School Food Service Staff Training

The aims of the 2 articles specific to food service staff training were more explicit in training outcomes than previously discussed interventions.^{27,28} The intervention detailed by Roth-Yousey, Barno, Caskey, Asche, and Reicks²⁸ included 211 participants and aimed to increase the knowledge, positive attitudes and intentions to use whole grain products in the

school food service setting, while Oakley²⁷ describes an intervention with 42 participants targeted at increasing knowledge regarding special dietary restrictions. These were both one time class interventions with programs that integrated presentations and participatory activities, including problem solving exercises and menu planning practice. In addition, the whole grain class included hands on culinary activities and participant discussion. To assess impact of the whole grain education class, participants completed an identical pre and post workshop survey as well as a follow up survey three to six months following the class. According to these measures, knowledge increased immediately following the class, however, some attitudes regarding the ease of whole grain use actually diminished following the class. In the follow up assessment, researchers found that knowledge had been maintained, and the majority of respondents had increased the use of whole grain items in their kitchen. Assessment in the Oakley study included pre and post workshop measures to evaluate knowledge and skills gained, a workshop experience survey to assess participants attitudes regarding the workshop itself, and a follow up survey to assess participants applications of the training. Evaluation tools were obtained from the National School Food Service Management Institute (NFSMI), as the material taught was based on a NFSMI module. Based on these evaluations, participants had an overall positive view of the training, increased their knowledge on the topic, and felt that they were able to implement knowledge in their workplace.

DISCUSSION

From these interventions, a number of lessons regarding food service staff training can be understood. First, promoting a positive attitude regarding food service changes amongst the food service staff is key to successfully implementing and institutionalizing goal behaviors.^{20,25} Developing positive relationships between interventionists and staff, encouraging discussion and

feedback, and maintaining long term support from administration and trainers all contribute to positive staff regard.^{12,19,23-25} Second, full implementation of behaviors may take an extended period of time, so prolonged interventions over several years are likely to result in a higher degree of adherence and compliance.^{17,20} Follow up trainings and continued contact and interaction with interventionist further promotes continued adaptation of behavior modifications. Third, training and messaging must comply with the current available infrastructure of the school food service program. Encouraging small changes utilizing current equipment available or modifying purchasing practices if the facility is only equipped for “heat and serve” service is more effective than promoting drastic change that cannot be implemented with available resources.^{13,15} Finally, easing barriers to attendance by timing trainings during regular work hours or providing additional pay or compensation for attendance may increase participation and promote a more positive attitude regarding training.¹⁷ While it is clear that skills training is vital to implementing most modifications in school meals, effective training must address more than just specific food preparation practices. Appropriate staff training can provide food service staff insight into the important role that they play in creating a healthy school environment. The greater the degree of involvement and interconnectedness that the staff feels with the greater school health goals, the more likely they are to adhere to and contribute to a healthier school environment.¹⁴ In addition, training should provide resources and promote efficacy in overcoming environmental barriers with training and technical assistance aimed at procurement practices, budget control, and promoting staff support and buy in. Even with this type of promotion, more dramatic menu, meal, and production changes are likely when staff training is paired with infrastructure changes, like the purchasing of new equipment.^{13,15} The literature does support the efficacy of staff training in modifying menu composition and fat content of meals.

However, the limited ability of interventions to reach sodium goals indicates that farther reaching systemic changes, including modification of vendor products, may be necessary. Significant decreases in sodium were found in training programs focused on increasing scratch cooking and involved increased staff culinary knowledge and modification of purchasing practices,^{21,26}

Based on the limited number of peer reviewed articles addressing the topic of school food service staff training, there is significant need and opportunity for future research. Just one study completed long term (5 years) follow up to assess the institutionalization of behavior change. Significant research is necessary to identify the best training techniques and approaches to promote long term change adherence in school food service programs. None of the studies included in the review adhered to experimental methodology, so future research could produce higher quality data by utilizing both control and experimental groups. Also, with the new USDA school meal guidelines recently introduced, food service staff training needs may have changed somewhat based on the changes in the guidelines. Further investigation regarding new training needs is necessary to best assist schools in meeting guidelines. In addition, future research should explore the most time efficient and cost effective training techniques and strategies as the USDA Proposed Professional Guidelines for School Food Service Professionals are implemented.¹⁰ Finally, the literature exhibits a lack of accessible and validated evaluation tools aimed at school food service trainings. While the NFSMI training evaluation tool may be appropriate for assessing overall training perceptions, tools specific to the knowledge and skills of food service staff are limited.

Limitations

There are several limitations to consider with this literature review. First, the search terms selected may not have retrieved all studies relevant to the topic. Second, the authors chose to exclude studies that did not provide explicit information regarding school food service staff training as part of the intervention. These studies could potentially have provided relevant information, specifically regarding necessary dose of training, but sufficient information about training was not found in the published literature. Finally, the authors chose to include only peer-reviewed literature to increase research validity and reliability, so potentially relevant documents (i.e. grant reports, university extension programs, government reports) may have been excluded. This approach is justified in order to better understand future research needs.

Conclusion

With new nutritional guidelines, professional development standards, and a stronger interest and emphasis on providing healthy and appealing school lunches, effective training for school food service staff is more important than ever. While the current literature can provide some insight into practices that can promote increased participation and adherence to training, there is still a significant need for research on best training practices and training practices that will meet the needs of today's changing school food service. School food service staff are integral to providing healthy school meals and promoting healthier schools. A thorough understanding of the best way to provide them with the skills and training they need to do so is vital to continued improvement in school meals and children's health.

IMPLICATIONS FOR SCHOOL HEALTH

Improving the quality and nutritional value of school meals has broad implications for overall school health. Nutritional deficiencies and inappropriate intake can have detrimental impacts on academic performance and ability to learn.²⁹ By focusing on improving overall quality of food, appropriate training for food service professionals may not only increase nutritional quality of meals served, but also palatability and acceptability to students. To capitalize on these benefits, schools should implement comprehensive and carefully structured training for their school food service staff. Training must address not just basic culinary skills and job duties, but empower school food service professionals with nutrition and policy knowledge to answer the “why” questions regarding school meal requirements. Training should be ongoing and provide significant follow up and reinforcement to better institutionalize learned practices. Schools have a unique opportunity at this time to take advantage of programing and grant funding to support food service staff training.³⁰ Appropriate training and maximization of available training resources could potentially lead to greater program participation, reduced food waste, and overall better nutrition for students.

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Figure 1.

Flow Chart of Article Selection Process for K-12 School Food Service Staff Training

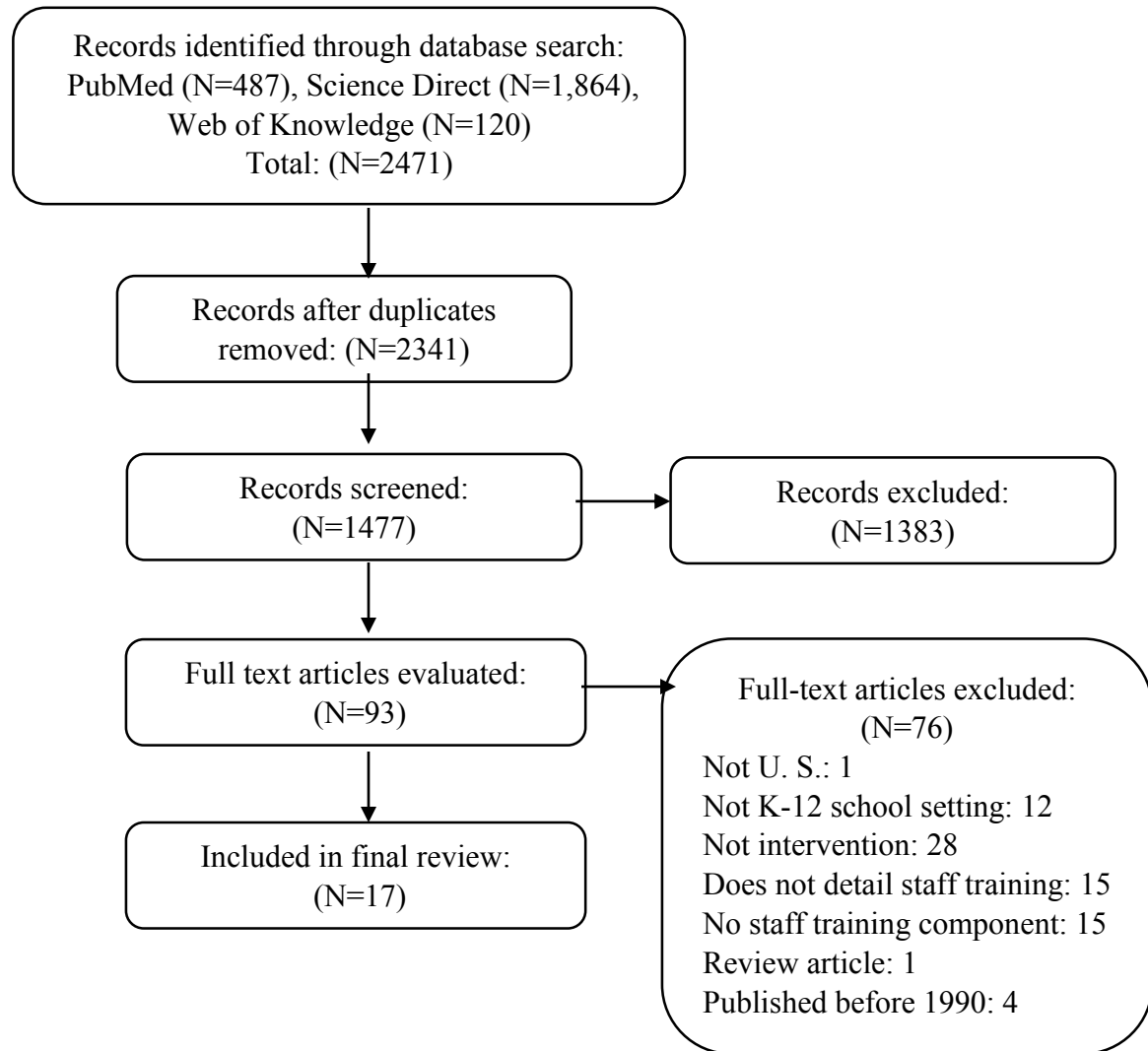


Table 1. Overview of Interventions That Address Food Service Staff Training in K-12 Schools

First Author and Year	Intervention	Sample Size/Location	Intervention Components	Food Service Component Aims	Food Service Staff Training Methods	Training Areas Addressed	Outcomes
Comprehensive School Health Interventions							
Gillis B (2009) ¹²	HEALTHY Study	42 middle schools; 7 U.S. cities	School food environment, Physical activity, Classroom curriculum, Parent involvement	Decrease fat content, increase variety of F & V offered, limit portions and calories of snacks and deserts, increase high fiber offerings	Initial training session (length unspecified), twice yearly booster sessions, weekly follow up meetings	Risk factors for type 2 diabetes, overview of intervention, techniques to meet nutrition goals	Unspecified
Harris KJ (1997) ¹³	Kansas LEAN School Intervention Project	4 elementary schools; KS (urban and rural)	Food service changes, Physical activity, Classroom curriculum, Community partnership	Decrease fat content of lunches	Workshops (frequency and duration unspecified), one to one training and coaching	Food preparation techniques, identification of lower fat products from vendors	Fat content of school lunches decreased from baseline
Levine E (2002) ¹⁴	Team Nutrition	19 elementary schools; 7 U.S. districts	Food service changes, Classroom curriculum, Community partnerships	Modify meals to meet USDA guidelines	10 hours of training	Menu changes to adhere to USDA Dietary guidelines, cooking techniques (low-fat), public relations/marketing	Food service staff expressed positive feelings about the project and felt involved in implementation
Nicklas TA (1992) ¹⁵ Osganian SK (1999) ¹⁶ Perry CL (1997) ¹⁷	CATCH (Child and Adolescent Trial for Cardiovascular Health) Eat Smart	96 elementary schools (223 food service staff members); 4 states (CA, LA, MN, TX)	Classroom curriculum, Food service changes, Physical education	Decrease fat (<30% of total energy), decrease saturated fat (<10% of total energy), decrease sodium (600-1000 mg per serving)	1 day (4-8 hour) initial training, monthly support visits, yearly 4-hour booster trainings	Program guidelines, menu planning, food purchasing and preparation, cafeteria program promotion	Significant decrease in fat, saturated fat, and cholesterol from baseline
Story M (2003) ¹⁸	Pathways	41 elementary schools; 7 American	Food service changes, Physical activity, Classroom	Decrease fat content of meals to <30% of total energy	2 2-hour training programs, 1 day/month working	9 behavioral guidelines, hands-on skill training related	Significantly greater decrease in fat and saturated fat content

Snyder P (1999) ¹⁹		Indian Nations	curriculum, Parental involvement,		side by side w/ intervention staff	to guidelines, taste tests of appropriate food choices, feedback/sharing of experiences	of school lunches in intervention schools than control schools
Story M (2000) ²⁰	5-a-Day Power Plus	20 elementary schools; St. Paul, MN (urban)	Food service changes, Classroom curriculum, Parental involvement,	Increase promotion, attractiveness and variety of fruits and vegetables	2 hour initial training with, additional 2 hour training once each year	8 guidelines on offering F & V, 4 guidelines on F & V promotion	More fruit and vegetable variety and promotion at intervention schools. Staff reported increased confidence.
Food Service and Food Environment Interventions							
Cohen JF (2012) ²¹	Chef Initiative	4 middle schools; Boston, MA (urban)	Menu Changes, Staff training	Eliminate trans fats, reduce overall fat, added sugar, and sodium content of meals, increase whole grain offerings	Chef and food service staff work side by side 2-3 days/wk	Scratch cooking techniques, achieving nutritional goals	Intervention schools served more whole grains, more fresh or frozen fruits and vegetables, and meals contained less sodium than control schools
Donnelly JE (2000) ²²	N/A	2 elementary schools; Hastings, NE	Menu changes, serving style changes	Modify meals to meet USDA guidelines	Unspecified	Menu planning, meal preparation/cooking modifications, nutrient analysis	Modified menus prepared with introduced cooking techniques met USDA guidelines
Goldberg J (2009) ²³	Shape Up Somerville: Eat Smart, Play Hard	1 school district; Somerville, MA (urban)	Menu changes, Staff training, Increased communication	Increase variety of fresh F & V options, increase nutritional quality of meals	Workshops (frequency and duration unspecified), monthly district wide food service manager meetings	Hands on techniques (ex. knife skills and F & V preparation), basic nutrition, encouraging and modeling healthy food choices	Increase in F & V offerings, food service staff has increased positive views of healthier meals
Perlman SE (2012) ²⁴	N/A	1 school district (1700 schools); New York, NY	Personnel changes, Modification of menu items, Change beverage offerings,	Increase overall nutritional quality of meals	Extended partnership between chefs and school food service staff	Enhance visual appeal of food, increase staff efficiency, adherence	Not specified

			New nutrition standards			to standardized recipes	
Snyder P (1992) ²⁵	LUNCHPOW ER!	34 elementary schools (100 food service staff); MN (urban, suburban, and rural)	Recipe modifications, Purchasing changes, Meal preparation practices	Decrease fat content of lunches (<30% of calories), reduce sodium (<1000 mg per day)	2 hour training program	Intervention information, importance of intervention, altering menus and preparation techniques to reduce fat and sodium	Significant decrease in total fat and % calories from fat compared to baseline data. Not significant change in sodium
Taylor S (2014) ²⁶	NA	5 high schools (11 food service staff); Shasta County, CA (rural)	Purchasing changes, Meal preparation practices	Decrease sodium content of school meals	1 short awareness promoting presentation, 3 day hands-on training, 1 procurement workshop	Dangers of high sodium diet, hands on training, skills for scratch cooking, procurement practices	Modest reduction in sodium in meals
School Food Service Staff Training							
Oakley C (2011) ²⁷	Eating Good and Moving Like We Should	42 school nutrition administrators and managers; MS	NA	Increase staff ability to meet special nutrition needs	4 hour sessions: lecture, problem solving activities	Addressing special dietary needs: federal regulations and addressing specific issues (diabetes, allergies, inborn errors of metabolism)	Increased participant knowledge, positive reaction of participants, participants able to apply knowledge in work setting
Roth-Yousey L (2009) ²⁸	NA	211 school food service managers and staff; MN	NA	Increase whole grain knowledge, attitude about serving whole grains, and intention to use whole grains in food service	3-hour program: participatory approach, activities, demonstrations, discussion	Whole grain basics: what is a whole grain, health benefits of whole grain, identifying whole grain; Whole grain preparation: improving acceptability, cost control, menu planning; Whole grain promotion	Increased whole grain knowledge and intention to increase whole grain use, decrease in positive attitude about use, increase in amount of whole-grains offered

