

INDICATORS OF SUCCESS WHEN INCORPORATING WHOLE GRAINS INTO SCHOOL

MEALS: HEALTHIERUS SCHOOL CHALLENGE

A Thesis

by

CHRISTINE ELIZABETH SCEETS

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

August 2011

Major Subject: Nutrition

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Approved by:

Chair of Committee,	Peter Murano
Committee Members,	Jenna Anding
	Josie Coverdale
Intercollegiate Faculty Chair,	Stephen Smith

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ABSTRACT

Indicators of Success When Incorporating Whole Grains into School Meals: HealthierUS
School Challenge.

(August 2011)

Christine Elizabeth Sceets, B.S., Texas A&M University

Chair of Advisory Committee: Dr. Peter Murano

The *2005 Dietary Guidelines for Americans* for the first time emphasized an increase in daily whole grain consumption in children, adolescents, and adults, and identified a recommended intake of 3 one-ounce servings per day. Despite national dietary policy recommendations and current scientific evidence encouraging an increase in whole grain intake, most Americans are consuming less than one whole grain serving per day. Therefore, a need to determine methods to increase whole grain intake in Americans does exist. One identified method would be to increase whole grain intake in children through the incorporation of whole grain foods into school meals.

This study was designed to determine, through the creation of an online survey, methods utilized by school food service professionals overseeing HealthierUS School Challenge Gold rated elementary schools to successfully incorporate whole grain food products into school meals.

Data collected from the online survey indicated school food service professionals that incorporated whole grains into their school meals by slowly modifying recipes and gradually incorporating new whole grain foods onto their existing menu were the most successful. Survey

results also indicated that students preferred partial blend whole grain products compared to those made from 100% whole wheat. Additionally, survey participants reported barriers to whole grain food incorporation which included: product acceptability, whole grain product identification, whole grain product availability, and cost.

There is a need to further understand measures that can be taken to successfully introduce more whole grain food products into elementary school lunches without causing a decrease in consumption of the school meals by students. Data gathered from this survey will be shared with the United States Department of Agriculture's Food and Nutrition Service (USDA-FNS) to provide technical assistance to schools participating in the National School Lunch Program and School Breakfast Program on how to successfully menu whole grain food products in their schools and maintain alignment with current national dietary recommendations.

DEDICATION

To my grandparents

ACKNOWLEDGEMENTS

“I have no special talent. I am just passionately curious.”

~Albert Einstein

I would like to extend my appreciation to my committee: Dr. Peter Murano, Dr. Jenna Anding, and Dr. Josie Coverdale for their support during this project. To my advisor, Dr. Peter Murano, thank you for giving me the opportunity to work on such an outstanding project. I have learned a tremendous amount during this process. To Dr. Jenna Anding, thank you for your support through the duration of my project. To Dr. Josie Coverdale, I will always be grateful for your encouraging words of wisdom, moments of laughter, and continued guidance throughout my academic career. Thank you for your willingness to listen and for being such a great teacher.

A special thank you to my mentor Dr. Cindy Warren, whose valuable input throughout this project and thesis process will always be remembered and appreciated. Thank you for always believing in me, for your academic guidance, encouragement, and unwavering support. God has blessed me with an incredible teacher in you. Thank you for being part of this journey with me.

To my fellow grad students Sal Bertucci, Rachel Condie, Jessica Lucia, and Kelly Winsco, our adventures were many and laughter was lots. Many thanks for your friendship and memorable moments.

To my family, thank you for your support during my extended stay at Texas A&M. Without you, none of this would have been possible.

This study was funded by the United States Department of Agriculture #2007-503665.

TABLE OF CONTENTS

	Page
ABSTRACT	iii
DEDICATION	v
ACKNOWLEDGEMENTS	vi
TABLE OF CONTENTS	vii
LIST OF FIGURES	ix
LIST OF TABLES	xi
CHAPTER	
I INTRODUCTION	1
Specific Aims	3
II REVIEW OF THE LITERATURE	4
Obesity Statistics	4
Dietary Guidelines for Americans	5
National School Lunch Program	6
HealthierUS School Challenge	7
Whole Grains	9
III MATERIALS AND METHODS	12
Institutional Review Board	12
Sample Participants	12
Survey Development	13
Data Collection	14
Data Analysis	15

CHAPTER	Page
IV RESULTS	16
Whole Grain Knowledge	16
Whole Grain Foods	19
Whole Grain Food Items Served	21
Incorporation Methods	27
Barriers	31
Educational and Promotional Tools	39
USDA-FNS Website Information	43
V DISCUSSION	47
Product Acceptability	47
Repeated Exposure to New Foods	49
Purchasing	49
Application Process and Whole Grain Criteria	50
Education	51
VI SUMMARY AND CONCLUSIONS	53
REFERENCES	55
VITA	60

LIST OF FIGURES

	Page
Figure 1	When looking at whole grain labels, what serves as the best indicator to you that the product is whole grain? 18
Figure 2	How do you interpret the phrase, “this is a 100% whole grain food”? 19
Figure 3	What percent of whole grain is in the foods that you currently serve in your schools? 20
Figure 4	What percentage of your whole grain requirement is met by using 100% whole wheat? 21
Figure 5	What types of whole grain foods are your students currently eating? 22
Figure 6	Have you ever requested your vendors to carry specific whole grain foods to serve in your schools? 24
Figure 7	Compared to your award winning elementary school(s), is there any difference in the types of whole grain foods that you offer at your elementary schools versus your intermediate/junior high schools and high schools? 25
Figure 8	What steps did you take to comply with the criteria for the HealthierUS School Challenge? (check all that apply) 28
Figure 9	How did you incorporate whole grain foods into your schools? (check all that apply) 29
Figure 10	Do you serve any of the whole grain food items or flour available from USDA-FNS? 30
Figure 11	If you did serve whole grain food items or flour available from USDA-FNS, which items did you use? 31
Figure 12	From a food service director’s perspective, how easy or difficult has it been for you to find and purchase the whole grain foods served in your schools? 32

	Page
Figure 13	How successful have you been in obtaining whole grain products from your vendors? 34
Figure 14	How easy or difficult was it to meet the criteria for the HealthierUS School Challenge? 35
Figure 15	What were specific challenges that you have had to overcome when you added whole grain foods into your menus? 37
Figure 16	What was the hardest component of the HealthierUS School Challenge criteria to meet? 38
Figure 17	What type of information would you like to see on grain food labels that would help you understand the product is a 100% whole grain food? 39
Figure 18	What types of nutrition education tools do you use in order to promote whole grain food consumption in your schools? 40
Figure 19	What types of promotional materials would you like to see in your schools? ... 41
Figure 20	Have you performed any training with your food service personnel on how to select, prepare, or serve whole grain foods? 43
Figure 21	Please rate the usefulness of the current USDA-FNS website in terms of its resource material on whole grains. 44
Figure 22	The USDA-FNS website does not currently offer information concerning commercially available consumer whole grain food products that are also available to the school lunch program. Would adding this material to the website be useful to you? 45
Figure 23	Which of the following items would be useful for you and your staff if you could access this information on the USDA-FNS website? (check all that apply) 46

LIST OF TABLES

	Page
Table 1	How would you define the term “whole grain”? 17
Table 2	If you could purchase 3-4 additional whole grain food products available on the market to offer in your schools, what would they be? 23
Table 3	If “yes” is your response to the previous question: “Is there a difference in the whole grain foods offered in your elementary schools versus your intermediate/junior and high schools”, what is the difference? 26
Table 4	Why is there a difference in the whole grain foods offered in your elementary schools versus your intermediate/junior and high schools?..... 27
Table 5	If you answered "difficult" or "very difficult" when finding and purchasing whole grain foods served in your schools, please tell us why. 33
Table 6	If you answered “difficult” or “very difficult” when meeting the HealthierUS School Challenge criteria, please tell us why. 36
Table 7	Please include any additional comments and suggestions here: 42

CHAPTER I

INTRODUCTION

Upon the release of the 2005 Dietary Guidelines for Americans (2005 DGA) came the first recommendation for increasing whole grain consumption to at least 3 servings (equivalent to three ounces) per day (1,2). In October 2009, the Institute of Medicine (IOM) released the report *School Meals: Building Blocks for Healthy Children*, recommending that the United States Department of Agriculture's Food and Nutrition Service (USDA-FNS) align school meals with the 2005 DGA (3). Despite national dietary policy recommendations (2) and scientific evidence highlighting the beneficial effects of whole grain consumption (4,5), most American children, adolescents, and adults consume less than one whole grain serving per day (6).

The National School Lunch Program (NSLP) is the second largest food and nutrition assistance program in the United States (7). At least once per week, approximately 60 percent of American school children age 5-18 participate in this program, with more than half of the meals served free or at a reduced price to children who qualify based on income eligibility (8). Since children spend a large amount of time each day in school and consume a significant portion of their daily food intake in this setting (9,10), the NSLP provides an efficient conduit for the translation of national dietary policy into the daily lives of America's school children (6,11,12,13).

This thesis follows the style and form of the *Journal of the American Dietetic Association*.

In an effort to encourage elementary schools to take a leadership role in decreasing childhood obesity through the emphasis of nutritious eating patterns and active lifestyle choices, USDA-FNS established the HealthierUS School Challenge (HUSSC) (14). This recognition program holds three levels of achievement: HUSSC Gold, Silver, and Bronze. In order to achieve a HUSSC Gold status, one criteria set forth by this program required recognized HUSSC Gold schools to offer one whole grain food item everyday at lunch (15,16). In December 2008, USDA introduced a fourth level to the HUSSC: Gold Award of Distinction. This level maintained the same whole grain requirements as HUSSC Gold schools but placed restrictions on sodium levels in school meals and increased the requirements for physical activity (15). Note that the addition of a fourth level to the HUSSC was not included in the current study.

As stated in current literature, successfully incorporating whole grain foods into school meals are faced with many challenges (17,18,19). Whole grain food products are considered to be more expensive than a similar refined product, forcing schools to choose between nutrition and maintaining a set budget (3,17). Additionally, student acceptability of whole grain foods is hindered by the perception of inferior taste, texture, and color of the whole grain product (17,18,20), as well as a lack of familiarity with whole grain foods (21,22). Thus, it can be speculated that serving whole grain foods in schools may result in decreased meal consumption, a decline in student participation in school meals, and a subsequent loss of income to school food service. Therefore, there is a need to identify measures that can be taken by school food service professionals to successfully introduce more whole grain food products into elementary school lunches without decreasing consumption of school meals by students (23).

The purpose of this study was to determine, through the use of an online survey, how school food service personnel with Gold HUSSC schools in their district have successfully incorporated whole grain foods into their school meals. An “indicator of success” was defined as a measure taken by a HUSSC Gold rated school to successfully menu whole grain food items without a decrease in school meal consumption. HUSSC Gold schools in this study were labeled “successful” since these schools were able to menu one whole grain food item daily that their students consumed on a regular basis. Determining how school food service professionals have been successful when providing acceptable whole grain foods that students consumed on a regular basis would be of interest to policy makers, industry and other school food service professionals.

Specific Aims

- To develop, test, and implement an online survey to gather information from school food service directors overseeing Gold rated HUSSC elementary schools.
- To determine the indicators of success in providing whole grain foods from school food service personnel having Gold HUSSC elementary schools listed on USDA-FNS website in September 2008.
- To determine, through survey analysis, the most frequently served whole grain food products, methods to menu whole grain food products, and barriers to their implementation.

Hypothesis: *Indicators of successful incorporation of whole grain food products into school meals will be obtained through the use of an online survey.*

CHAPTER II

REVIEW OF THE LITERATURE

Obesity Statistics

Childhood and adolescent obesity has risen substantially in the United States during the past 30 years. Since 1980, obesity rates have doubled for children and tripled for adolescents (24). Given these statistics, obesity has become a growing health concern for school aged children and predicted to become the most prevalent health issue in the United States (25). Today, social environments in America promote physical inactivity, increased food intake, larger portion sizes, and consumption of foods with low nutrient density, resulting in an increased risk of obesity to many American adults and children (26,27).

Childhood and adolescent obesity can have both immediate and long term health implications (24). Obese children are 70% more likely to become obese adults and show an increased risk of developing chronic diseases such as: type II diabetes, cardiovascular disease, hypertension, and certain types of cancer. Additionally, obese children are at a greater risk for social and psychological problems such as discrimination among peers and poor self esteem (24,27,28).

The growing concern over childhood obesity has led to the identification of school meals as an opportunity to offer more balanced and nutrient dense diets for school aged children (9). Schools have the opportunity to positively influence the eating patterns of students since more than 95% of American children from the age of 5-17 years old are enrolled in school (12,29). More than half of the students in the United States eat at least one of their three daily meals in

school and one out of 10 students consume two of their daily meals in school (29). Since regular whole grain consumption has been associated with weight maintenance in adults (28), the same effects may be seen in children. Thus, targeting school meals could provide an environment that encourages whole grain consumption, serves as an effective intervention for implementing current national dietary policy, and possibly impacts rising childhood obesity in the U.S. (9).

Dietary Guidelines for Americans

The 2005 DGA has recognized the growing American trend of excess caloric intake and inadequate consumption of nutrients necessary for normal growth and development of children. The above listed factors have been suggested to increase the incidence of chronic disease and improper weight maintenance (30). The 2005 DGA provided recommended intakes for grains, fruits, vegetables, fats, protein, dairy, as well as vitamins and minerals. Additionally, noting the relationship between physical activity and overall wellness, the 2005 DGA emphasized the importance of regular physical activity. (2, 30).

Recommendations for grain consumption were adjusted for the first time in 2005, and more specifically stated that half (3 out of 6 daily servings) of daily grain intakes should be consumed as whole grains (6,31,32). However, diets of American school children fall below this current recommendation, with children consuming an average of 0.8 to 1.0 servings of whole grains per day (6). Since eating habits are thought to start during childhood (33) and reinforced through repeated exposures to certain foods (6,33), schools may provide an opportunity for children to develop a preference for whole grain foods. Therefore, this venue can facilitate

increasing consumption levels of whole grain foods to more closely reflect current national dietary recommendations.

National School Lunch Program

Established in 1946 by Harry S. Truman, the NSLP was created as an effort to “safeguard the health and well-being of the Nation’s children and to encourage consumption of nutritious agricultural commodities and other foods” (30). This program was established when malnutrition due to poverty was a concern and when more than half of all men applying for military service were rejected (34,35).

In contrast to the nutritional deficits seen in children and adolescents during the infancy of the NSLP, obesity is currently a growing health concern for American school children (25). As a result, foods provided by the NSLP have transitioned from the more energy dense food options seen in the mid 1940’s, to lower calorie and more nutrient dense items today (30). Again, realizing the impact of school meals on children’s diets, foods provided by the NSLP must follow current dietary recommendations (36) and provide students with lower fat menu items, fruit and vegetable options, and more whole grain items without causing a decrease in student school meal participation (25,30).

Overseen by the USDA, the NSLP currently serves 31.3 million children daily, with 16.3 million of these meals being served free to students who qualify (8). Schools are not required to offer NSLP meals, however 94% of schools, both public and private choose to participate (30). NSLP school participants receive assistance from the USDA in the form of cash and commodity foods for each meal served (25,36,37). In exchange for federal assistance, schools participating

in the NSLP must serve meals that meet food safety and nutrition standards specified by the USDA (37) and must serve meals free or at a reduced price to students meeting income eligibility (25,30,37). The greater the student participation in this program, the greater amount of reimbursements for free and reduced price meals participating schools will receive (30). In summary, food nutrition programs such as the NSLP, allow children and adolescents at risk for poor nutritional intakes to have access to an adequate and nutritious food supply. These programs not only serve as a way to prevent or reduce hunger and food insecurity, but also promote nutrition education and physical activity, both of which can aid in the prevention of obesity and chronic disease (25).

HealthierUS School Challenge

In response to the rising obesity epidemic and the influence of school meals on dietary intake, the HUSSC was developed in 2004 by USDA-FNS (38,39). The HUSSC recognizes elementary schools which have taken steps to improve their school nutrition environment and encourages other schools to follow in this direction (38). This program bases its nutritional requirements for elementary school meals on the 2005 DGA. Schools recognized by the HUSSC have improved the quality of foods served, provided students with nutrition education, as well as opportunities to participate in physical activity (14).

In order to achieve a level of recognition under the HUSSC, certain guidelines regarding types of foods served in school meals must be followed. The HUSSC requires that recognized schools serve: a variety of fruits and vegetables each week (with a different fruit and vegetable served each day), a legume (such as canned peas and beans) must be served once weekly, and a

low fat (1% or less) or fat-free (skim) fluid milk must be offered each day. Additionally, the HUSSC emphasizes serving whole grain foods at a minimum of three times per week. The number of times that a whole grain food must be served varies depending on HUSSC level of achievement (15).

When the current study began, only three HUSSC award levels existed: Bronze, Silver, and Gold. Criteria pertaining to whole grain inclusion in school meals for Gold rated schools required that one whole grain food product be served for every day of the week in their school meals (15,16). In contrast, whole grain inclusion criteria for Bronze/Silver rated schools required that a whole grain food must only be served at a minimum of 3 days per week (15). Again, following the 2005 DGA, the HUSSC adopted the 2005 DGA whole grain definition and defines a whole grain food as an item that contains 51% or more whole grain ingredients by weight per reference amount (2).

Although these school recognition programs are encouraging an increase of whole grain foods served in school meals, the third School Nutrition Dietary Assessment (SNDA) study indicated that only 5% of all schools surveyed in 2004-2005 served whole grain breads and rolls for lunch, and only 4% served whole grain breads for breakfast (10). Limited whole grain products served (10), low consumption of whole grain foods by American school children (39), combined with the dietary influence of school meals on children (6), will focus this study specifically on the successful implementation of the whole grain portion of the HUSSC.

Whole Grains

According to Anderson and Hanna (1999), “Whole grain foods are emerging as a dietary constituent that delivers significant health benefits” (40). Health claims regarding the consumption of whole grain foods were issued by the Food and Drug Administration (FDA) in 1999, and stated that “diets rich in whole grain foods and other plant foods and low in total fat, saturated fat, and cholesterol may reduce the risk of heart disease and some cancers”. Additionally, the FDA (1999) defined a whole grain food as a product that must contain 51% or more whole grain ingredients by weight per serving (1,32). In 2006, the FDA stated that whole grains are “cereal grains that consist of the intact, ground, cracked or flaked caryopsis, whose principal anatomical components - the starchy endosperm, germ and bran - are present in the same relative proportions as they exist in the intact caryopsis” (41).

A grain kernel (caryopsis) is composed of three parts: the bran, germ, and endosperm (32,42). The outer covering, the bran (including the aleurone), is high in fiber, B vitamins and phytochemicals; while the inner germ contains beneficial nutrients such as vitamins, minerals, oils and phytochemicals (5,42,43,44). The middle layer, the endosperm, makes up 75-80% of the grain weight and consists mostly of starch (5,44). Prior to consumption, grains undergo a milling process that separates the bran/germ layer from the endosperm, thus refining the grain to improve flavor, color, palatability, appearance/cooking characteristics, and shelf life (21,32). By removing the bran and germ layer during the milling process, a large percentage of the beneficial nutrients are lost, resulting in a “refined” grain product that is considered nutritionally inferior to its whole grain counterpart (4,42).

Scientific evidence suggests an inverse relationship between consumption of whole grains and the risk of coronary heart disease, type II diabetes, obesity, and certain cancers (4, 5). Epidemiological studies in adults that support whole grain consumption suggest that these health benefits are attributed to the synergistic effects of the dietary fiber, vitamins, minerals, and phytochemicals found in the bran and germ components of a whole grain (4,5,32,43). Health benefits against type II diabetes can be related to the ability of fiber and resistant starches to slow the digestion and absorption of carbohydrates. This in turn may lower the glycemic index of foods, improve glucose response, and increase insulin sensitivity (4,5). Soluble fiber has been shown to inhibit absorption of lipids, lower serum cholesterol and decrease cardiovascular risk (45) while insoluble fiber may contribute to increased satiety and greater control of body weight by providing bulk to food and decreasing caloric food content (4,28). However, despite known health benefits related to consuming whole grain foods on a daily basis, only seven percent of Americans consume the recommended three servings of whole foods each day (46).

The 2005 DGA recommendations have prompted school food service professionals to incorporate more whole grains into school meals (39). The Dietary Guidelines are further supported by the 2009 IOM report, *School Meals: Building Blocks for Healthy Children*, which recommends that schools align meals served with the 2005 DGA (3). However this practice is faced with challenges due to some undesirable sensory aspects of whole grains combined with a notable American preference for a refined grain product (46).

Several barriers to increasing whole grain consumption through school meals have been identified and include: perceptions of inferior taste, texture, color, and increased cost when compared to the refined grain counterpart (20,39). Additionally, a general lack of knowledge

regarding the most acceptable types of whole grain products for students and fear of monetary losses due to a decrease in school meal consumption may also represent a barrier to whole grain incorporation in school meals (39,47). Finally, in an effort for students to receive the health benefits of whole grains, there is a need to identify more acceptable whole grain food options as well as methods to enable school food service professionals to successfully menu whole grains items and maximize consumption in school meals (18).

CHAPTER III

MATERIALS AND METHODS

Institutional Review Board

The proposed study has been approved by the Institutional Review Board (IRB) at Texas A&M University (College Station, TX) . Consent was procured from participating school food service personnel as part of the survey design. No names were associated with the data collected and information gathered was confidential. Participation in this study was not mandatory and incentives to participate were not provided. There were no known risks associated with participation in this study.

Sample Participants

School food service directors from across the United States, listed on USDA's Team Nutrition website as having achieved Gold status according to the HUSSC in at least one of their elementary schools, were invited to participate in this survey. As of September 2008, 33 school districts were listed on this website. Contact information for the school food service personnel for each of these Gold HUSSC schools were found via the Internet.

For organizational purposes, a database was created listing each state containing HealthierUS Gold schools. The database contained the following: name of each individual Gold elementary school, name of the corresponding school district, name of a contact person for each elementary school or school district's school food service department, and contact information

for each school food service professional. Contact information included: physical address, email address and phone number. Contact information was used to inform each school food service professional the purpose of the survey as well as access methods to the survey.

Each school district's school food service director was sent a letter requesting participation in an on-line survey concerning their indicators for successfully incorporating whole grain foods into their schools' meals. This physical letter outlined the purpose of the survey, identified dates of online survey availability, and informed individuals of an online link sent via email that allowed survey access. To increase participation after the survey was administered, a reminder was provided in the form of e-mail. Then, if necessary, a phone call was made requesting survey participation.

Survey Development

Questions for the online survey regarding successful methods for the incorporation of whole grain food products into school meals were constructed based on the results of an interview conducted in February 2008 with Sylvia Dunn, the school food service director for St. Tammany Parish, LA. The focus of this interview was to answer the question: "what are indicators of success when incorporating whole grain foods into school meals?". Input was sought from Mrs. Dunn due to the unique distinction of achieving a HUSSC Gold status in all elementary schools in her schools district. This interview yielded methods used to successfully incorporate whole grain food products into her elementary school meals. However, findings from this interview with Sylvia Dunn are not part of this thesis study.

Information from the above listed interview combined with the additional survey development resources: Don Dillman's *Mail and Internet Surveys: The Tailored Design Method* (48) and Mildred L. Patten's *Questionnaire Research: A Practical Guide* (49) guided the development of the online survey used for this study. The online survey contained 32 multiple choice and open-ended questions and was designed to gather information identifying methods utilized by all Gold schools listed on the HUSSC website to incorporate whole grains into their school meals. Before the survey was finalized, three Texas school food service directors provided input on the survey to confirm appropriate question length, clarity, and content.

Data Collection

Data was collected through the use of an on-line survey tool, Zoomerang.com, and was administered November 2, 2008- December 2, 2008. Each school food service professional asked to participate was emailed an online link to the survey along with a reminder of the purpose of the current research and the importance of each individual's participation/input. Respondents were given approximately one month to complete the survey.

Measures taken to increase response rate included email reminders and phone calls. Email reminders were sent at the beginning of the first and second week to those individuals who have not completed the survey. During week three, reminder phone calls were made to individuals who had not responded to the previous emails. Phone calls were also made to those who had not successfully received the survey link, either due to a change in email address, recipient's current email address having a full inbox, or difficulty gaining access to the survey.

One survey participant was unable to gain access to the online survey link and the survey was administered by phone.

Data Analysis

Data were generated in this survey from 32 multiple choice and open ended questions. Two types of multiple choice questions were written and utilized in this survey. The first type of multiple choice question was designed with a set number of answer choices and allowed only one answer per question to be chosen by each participant. The second type of multiple choice question allowed participants to select multiple answers for one question, thus giving participants the option to “check all answer choices that apply”. Frequency counts (50) were recorded for participant’s responses for each category/answer choice for these multiple choice questions. From the frequency counts, information concerning “indicators of success” was reported in tables and figures which provided a graphic representation of participating school food service directors’ methods utilized to incorporate whole grains into their schools meals.

Another source of data generated through the survey was by survey participants’ responses to open-ended questions. Each participant’s answers from the open-ended questions were placed into an Excel document. Using a print out of the Excel document, line-by-line open coding (51) was utilized on each answer and a corresponding category was placed in the margin. From this method, written data was divided into manageable segments of words and then placed into categories with similar themes (52). Frequency counts of these categories were made and used to construct either graphs or tables of the results.

CHAPTER IV

RESULTS

The following figures and tables represent responses gathered from this online survey designed to determine indicators of success when incorporating whole grain foods into school meals. For clarity and organizational purposes when analyzing and presenting respective data, common themes were determined among survey questions and questions were divided into the following groups for analysis: whole grain knowledge, whole grain foods, whole grain food items served, incorporation methods, barriers, educational/promotional tools, and USDA-FNS website information.

Whole Grain Knowledge

The most common theme that emerged from survey responses indicated that participants utilized information placed on the food product ingredient label to determine if a product was considered a “whole grain” (Table 1). Product label identifiers include: “the first ingredient listed is whole wheat” (31%), if a “food product contains 51% or more whole grain” (23%), a product that is made from “whole wheat flour” (12%), labels such as “good source of whole grain (4%), and products that fit the criteria for the HealthierUS School Challenge (8%).

The second most common theme seen among survey responses was the identification of a whole grain by the presence of its three principle components (bran, germ, and endosperm) (Table 1). Results indicated participating school food service professionals recognized that a whole grain contains nutritional components not present in a refined grain. Responses given that classify a product as a whole grain include: “containing all three components- bran, germ, and

endosperm (12%), the “outer covering **not** removed” (8%), “contains the entire grain seed (8%), “not refined flour, rice, and beans (12%), and “not processed to take away the nutrient value of the grain (4%).

Table 1. How would you define the term "whole grain"?

Response (n=26)	Percent
First/primary listed ingredient is “whole wheat”	31
A product that is 51% or more whole grain	23
Containing all 3 components: bran, germ, endosperm	12
Not refined white flour, rice, and beans	12
Whole wheat flour	12
Outer covering not removed	8
Contains the entire grain seed	8
Not processed to take away the nutrient value of the grain	8
HealthierUS criteria	8
“Good source of whole grain”	4
100% whole wheat	4
50% or more grain in the product is whole wheat	4

Information provided on a food label such as the ingredient list and nutrition facts panel were the major resources used by school food service professionals to determine if a product was a whole grain food (Figure 1). Approximately 82% of respondents indicated that the ingredient list served as the best indicator that a product is whole grain. The remaining 12% utilized information included on the nutrition facts panel on a food label as a whole grain identifier. The nutrition facts panel and the ingredient list are often placed on a food label in close proximity to each other and could be viewed as one entity used to differentiate between refined and whole grain products. Other product labels such as, the “listed percentage of whole grains per serving”

and “grams of whole grains per serving” were not utilized as methods to determine if a product is a whole grain food.

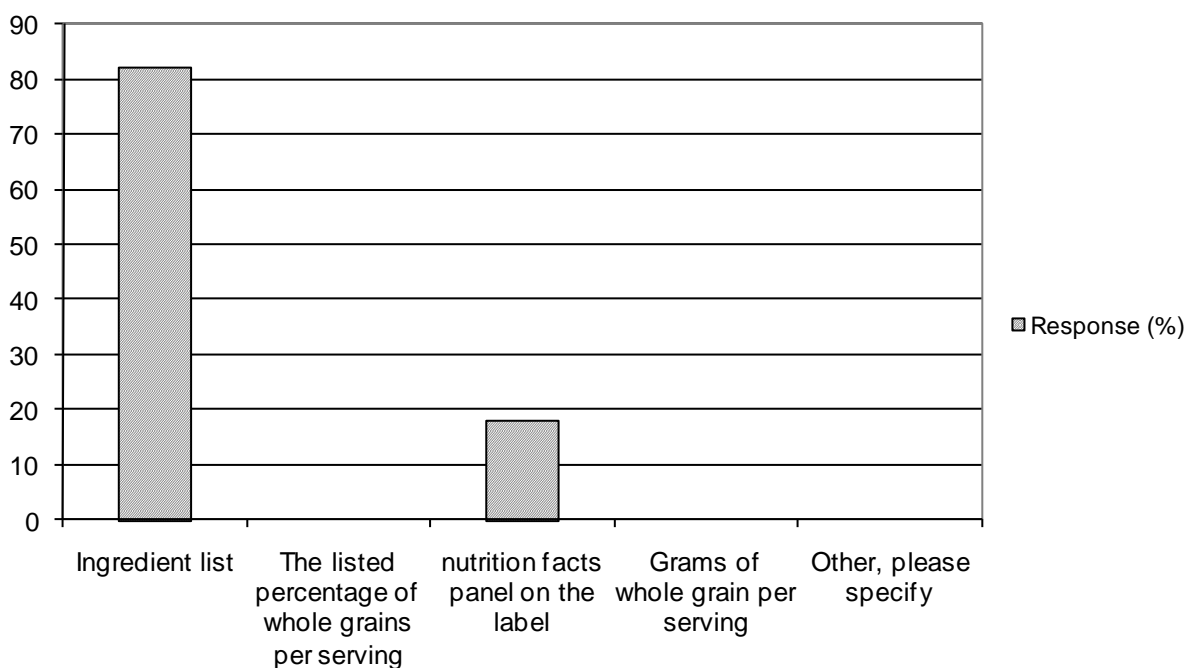


Figure 1. When looking at whole grain labels, what serves as the best indicator to you that the product is whole grain?
Response (n=28)

Participating HUSSC Gold school food service professionals were asked how they would interpret the phrase, “this is a 100% whole grain food” (Figure 2). In response, 71% of survey participants indicated that a 100% whole grain food is a food composed of 100% whole wheat or other grain. Eighteen percent of survey participants indicated that a “100% whole grain food” is one in which 51% of total flour content is whole wheat or other grain. While, seven percent of survey participants indicated that a “100% whole grain food” is a food in which 51% of the product by weight is whole wheat or other grain.

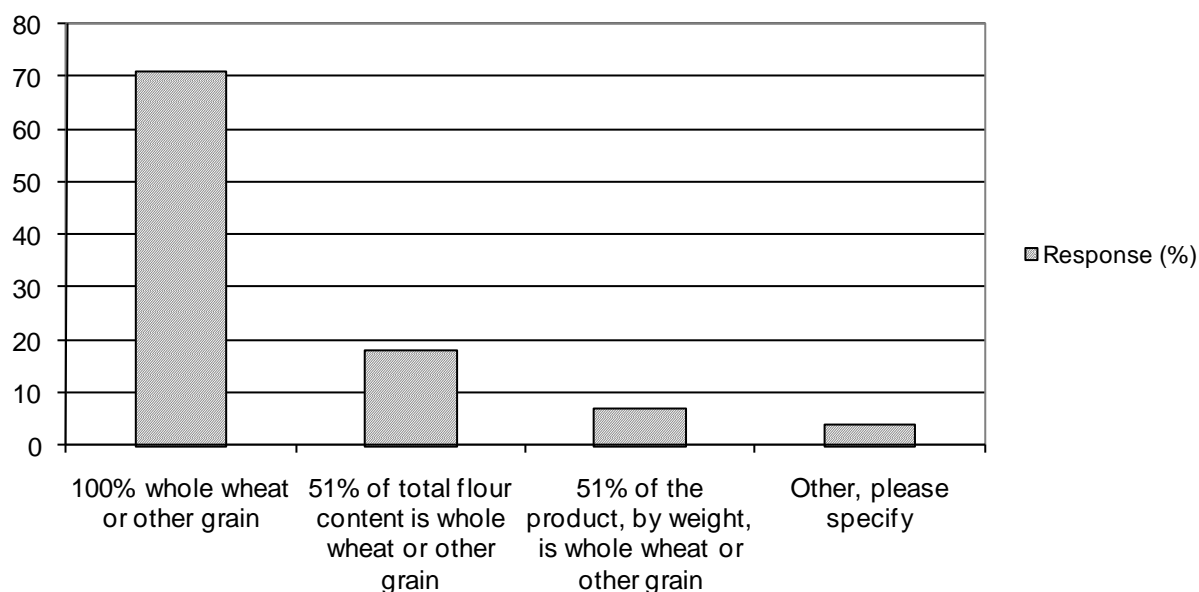


Figure 2. How do you interpret the phrase "this is a 100% whole grain food"? *Response (n=28)*

Whole Grain Foods

When HUSSC Gold school food service professionals were asked to determine the percentage of whole grain in the foods currently being served in their school meals (Figure 3), nearly half (46%) indicated that the percentage of whole grain in currently served food products was between 51-75% whole grain. Eighteen percent of survey participants reported serving whole grain food products that were 76-100% whole grain and 21% of surveyed individuals were not sure of the whole grain content of foods currently served in their schools. Additionally, 11% of survey participants served whole grain food products that contained between 26-51% whole grain, while the remaining 4% served products that were 0-25% whole grain.

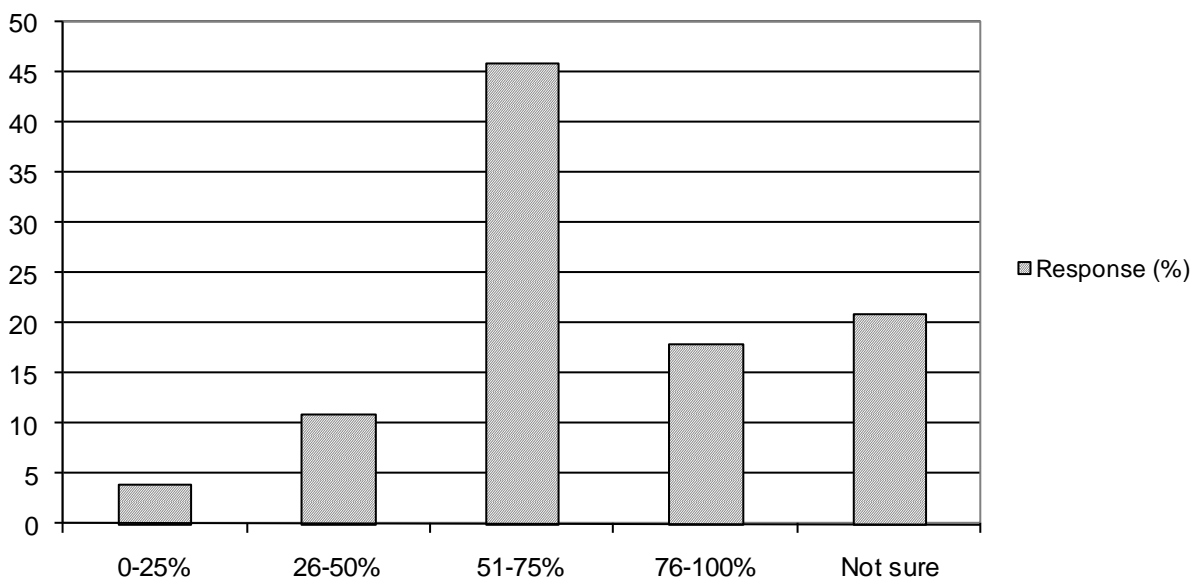


Figure 3. What percent of whole grain is in the foods that you currently serve in your schools? *Response (n=28)*

Twenty-two percent of survey participants indicated that 100% of whole grain foods served were a 100% whole wheat product when asked what percentage of whole grain requirements were met by using 100% whole wheat (Figure 4.) Thirty percent of survey participants indicated that 75-99% of whole grain products served were a 100% whole wheat product. Twenty-six percent of survey participants indicated that 50-74% percent of whole grain products served in their school meals were 100% whole wheat, while 7% indicated that 25-49% of whole grains served in their school meals were 100% whole wheat. Fifteen percent of survey participants indicated that 0-24% of their whole grain products served were a 100% whole wheat product.

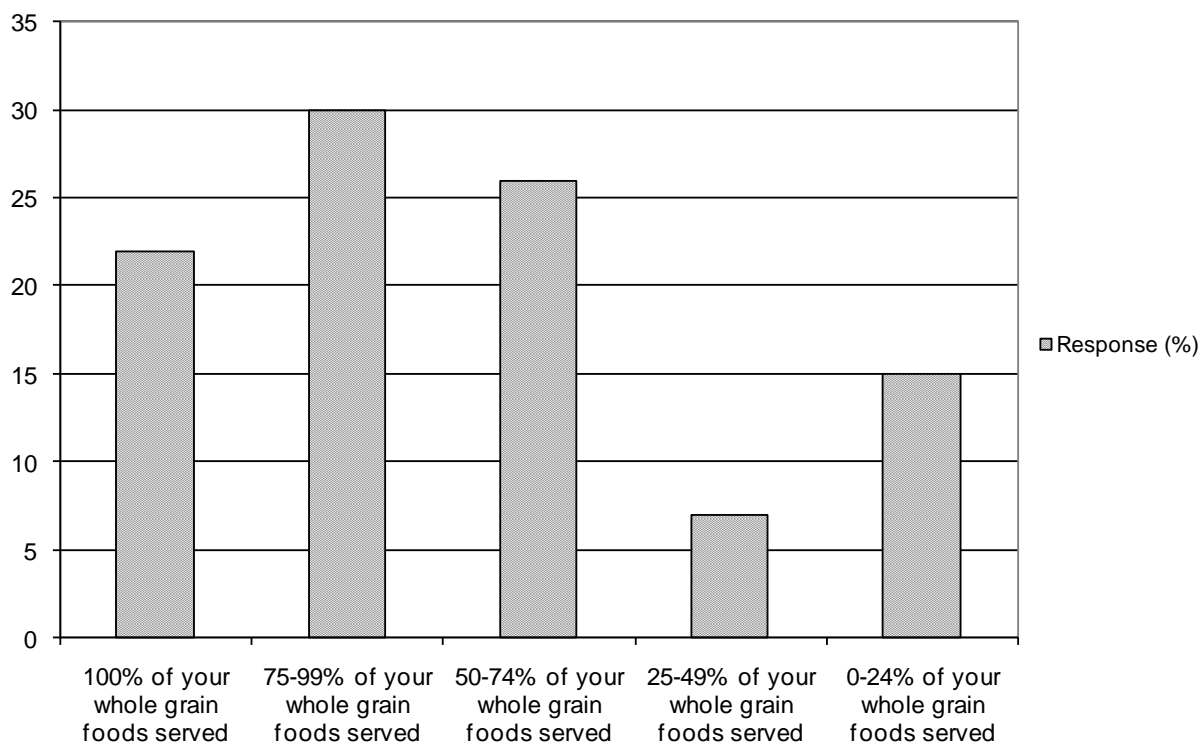


Figure 4. What percentage of your whole grain requirement is met by using 100% whole wheat? *Response (n=27)*

Whole Grain Food Items Served

Sandwich bread was the most commonly served food in our participants schools (93%) followed by rolls (82%), hamburger buns (71%), pizza (68%), and rice (64%) (Figure 5). These responses revealed the wide range of whole grain foods currently being consumed by students, and indicated that there is a variety of whole grain foods served in HUSSC Gold rated schools.

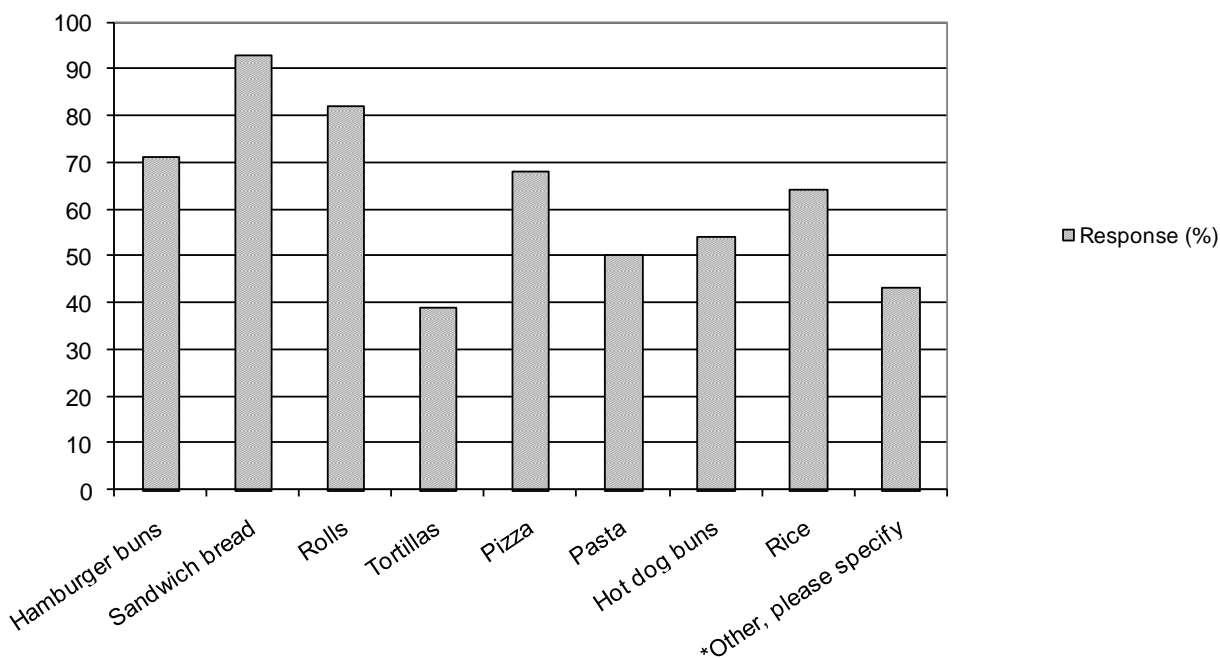


Figure 5. What types of whole grain foods are your students currently eating?
Response (n=28).

**Other whole grain products served in HUSSC gold rated schools include: cakes, cookies, chips, breadings, burritos, chicken nuggets, egg roll, corn dog, granola, apple crisp, crackers, hoagie buns, graham crackers, pretzels, cereal, waffles, garlic French bread, and grains in soups such as bulgur and barley.*

In response to the previous question inquiring “what type of whole grain products were currently being served”, participants were then asked to identify additional whole grain food products they would like to see “on the market” (Table 2). The following responses indicated that school food service professionals would like to see tortillas (28%), pasta (20%), hamburger buns (16%), and rice (12%). Additionally there was a need for whole grain pizza (8%), hotdog buns (8%), pancakes (8%), and dinner rolls (4%).

Table 2. If you could purchase 3-4 additional whole grain food products available on the market to offer in your schools, what would they be?

Response: (n=25)	Percent
Tortilla	28
Pasta	20
Hamburger buns	16
Rice	12
Whole grain pizza	8
Whole corn tortilla chips	8
Sub Rolls	8
Hotdog buns	8
Pancakes	8
Breading	8
Finding necessary product	8
Not sure	8
Proof and bake breadstick	4
1 oz breadstick	4
Barley	4
Soda crackers	4
Dinner rolls	4
Biscuit	4
Loaf bread	4
Muffin	4
Waffles	4
Couscous	4
Other grains	4
Roll Dough	4
Whole corn taco shells	4
Cookies	4
Corn dog	4

Overwhelmingly 86% of survey respondents indicated they had requested for vendors to carry specific whole grain foods to serve in their HUSSC Gold rated schools (Figure 6).

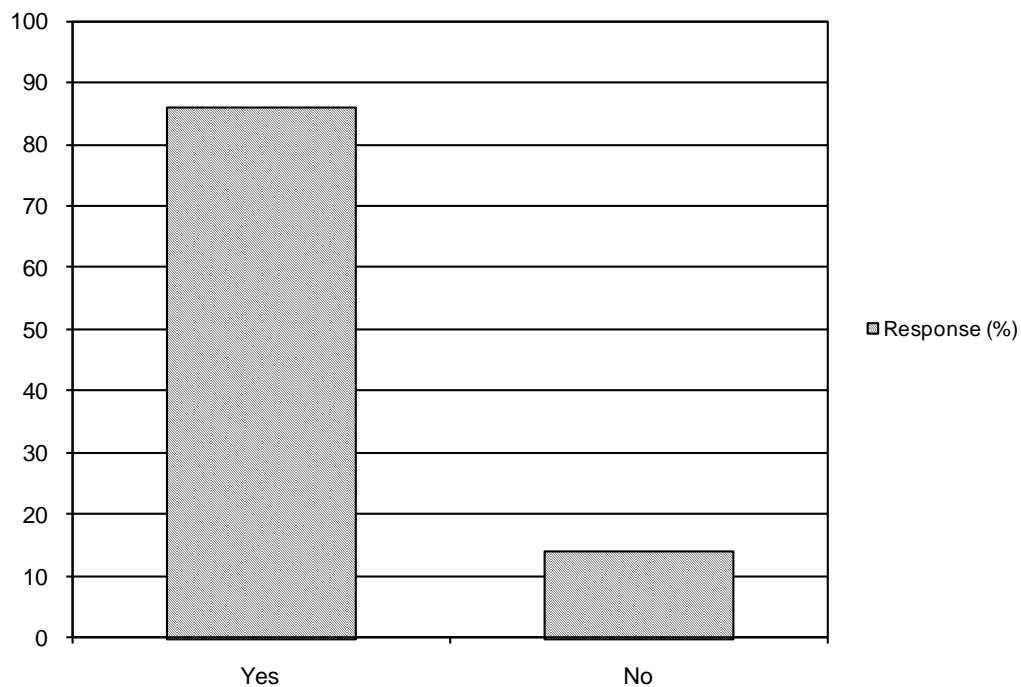


Figure 6. Have you ever requested your vendors to carry specific whole grain foods to serve in your schools?
Response (n=28)

Survey participants were asked to compare what whole grain foods they served in their HUSSC Gold rated elementary schools to intermediate/junior high schools and high schools in their district and whether there was any difference in the types of whole grain foods that are offered in these schools (Figure 7). Eighty-six percent reported no difference in the types of whole grain foods offered at the elementary schools compared to the intermediate/junior high schools and high schools. Only 15% of survey respondents did indicate “yes” there was a difference in the whole grain foods offered in their elementary schools compared to their intermediate/junior high schools and high schools.

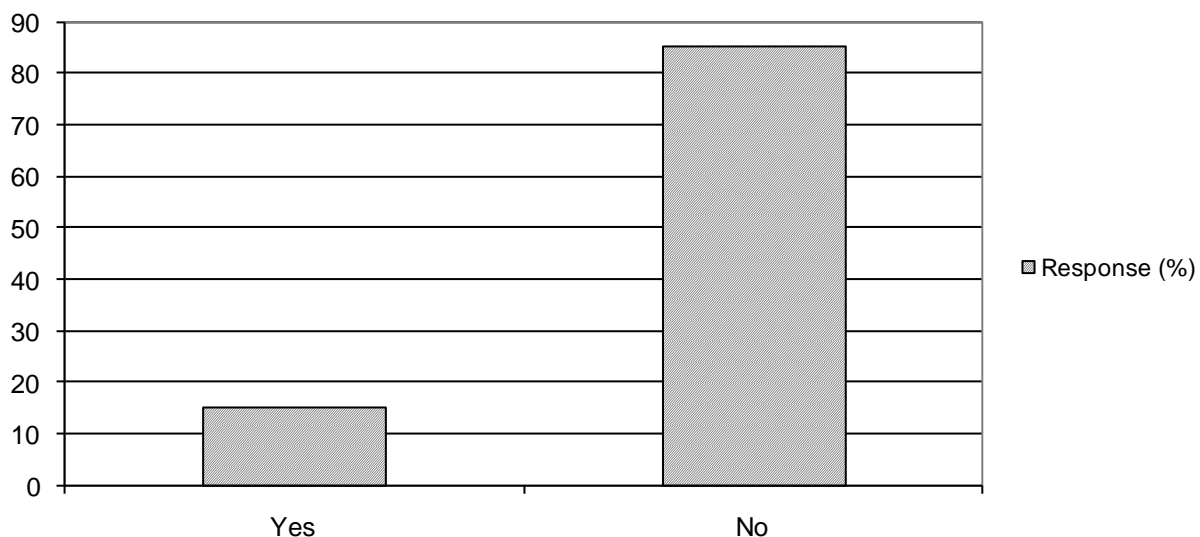


Figure 7. Compared to your award winning elementary school(s), is there any difference in the types of whole grain foods that you offer at your elementary schools versus your intermediate/junior high schools and high schools? *Response (n=27)*

Survey participants that indicated a difference in foods offered in their elementary schools compared to their intermediate/junior high and high schools were then asked to state the differences whole grain foods offered at the intermediate schools and high schools compared to their elementary schools (Table 3). Surveyed school food service professionals indicated that the differences included: elementary school items were baked from scratch while baked goods were purchased for middle schools and high schools. Different products offered in middle schools and high schools compared to elementary schools include: brown rice, fruits and vegetables, and fewer/different whole grain items served in secondary schools.

Table 3. If “yes” is your response to the previous question: “Is there a difference in the whole grain foods offered in your elementary schools versus your intermediate/junior and high schools”, what is the difference?

Response: (n=6)
Elementary school items baked from scratch, in contrast baked goods purchased for middle schools and high schools
Whole wheat bread
Brown rice
Fruits and vegetables
Fewer and/or different whole grain items in secondary schools
Currently implementing whole wheat items in junior high and high schools and offer a choice between whole wheat and white breads until students accept the whole wheat all of the time

Survey participants that indicated a difference in foods offered in their elementary schools compared to their intermediate/junior high and high schools were also asked to indicate “why there was a difference” between whole grain foods offered at these schools (Table 4). In response, school food service professionals indicated that there is a demand to offer fast food and/or convenience items for older students. Additionally, student complaints regarding whole grain foods, an elementary level focus instead of upper grade level focus for whole grain incorporation, and greater monetary cost of whole grains all contribute to the difference in whole grain foods offered in middle schools and high schools compared to elementary schools. Other responses included the need for nutrition education in an effort to increase student acceptability of whole grain products across all grade levels.

Table 4. Why is there a difference in the whole grain foods offered in your elementary schools versus your intermediate/junior and high schools?

Response (n=7)
Older schools concentrate on the demands of the students to offer fast food and/or convenience items
Not much time dedicated to baking from scratch
Not much time spent on educating students on food choices
Education needs to be emphasized in elementary schools, but also re-emphasized in later grades
Complaints from older students- If educated in lower grades, then will be more accepting at upper levels and will be able to eventually remove white flour products
Cost
Focus is at the elementary level, hoping to expand efforts to middle and high schools

Incorporation Methods

When responding food service personnel were asked what steps were taken to comply with the whole grain criteria for the HUSSC (Figure 8), 93% indicated they obtained desirable whole grain food products by purchasing these whole grain food items from a vendor.

Additionally, 36% indicated that they met whole grain criteria for HUSSC by making their own whole grain foods on site. This method of incorporating whole grains into school meals served as an indicator that school foodservice professional are using recipe modifications and adjustments to produce acceptable whole grain products to serve in their schools meals.

Additionally, “making whole grain foods at a central location” was reported by 14% of survey participants.



Figure 8. What steps did you take to comply with the criteria for the HealthierUS School Challenge? (check all that apply). *Response (n=28).*
**Other responses include: "We purchased only one item" and "All purchased bread products are whole wheat"*

A gradual approach, either through purchasing whole grain products from a vendor (67%) or through recipe changes (63%) represented the most commonly utilized methods to incorporate whole grains into school meals (Figure 9). The need to make recipe modifications by 63% of survey respondents eluded to the fact that recipe adjustments were necessary to meet the HUSSC whole grain criteria as well as student acceptability. Additionally, 41% of survey participants indicated that offering whole grain food products at the beginning of the school year as opposed to mid semester was also an effective method of transitioning from refined grain to whole grain food items in their school meals.

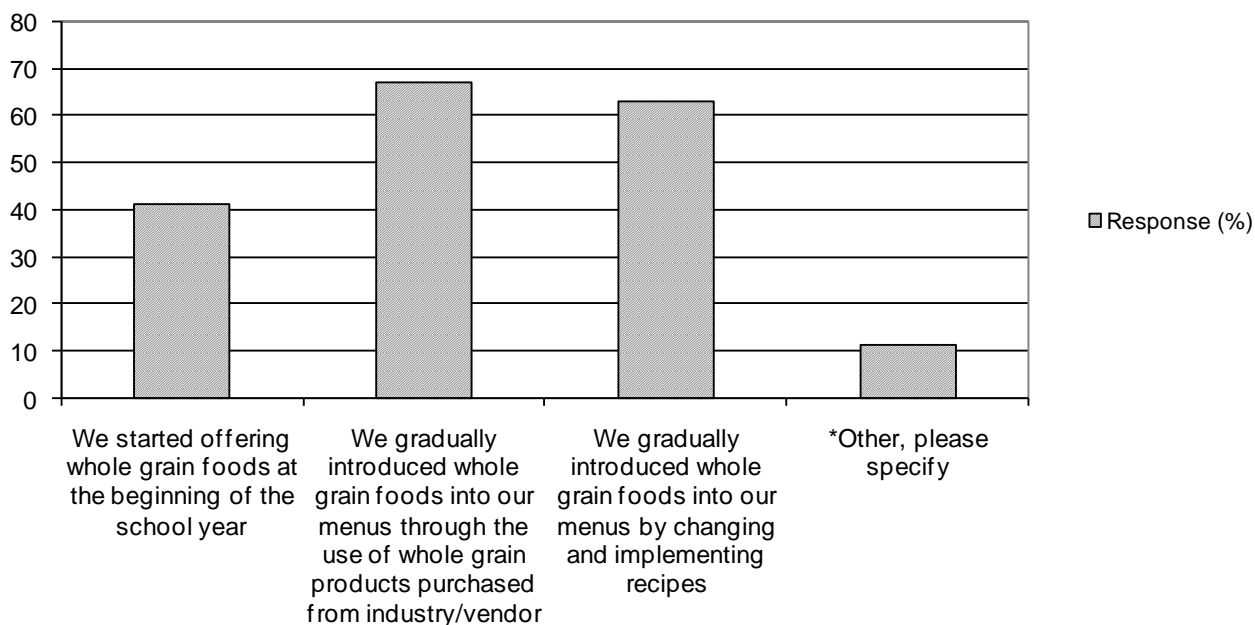


Figure 9. How did you incorporate whole grain foods into your schools? (check all that apply). *Response (n=27).*

**Other responses include:*

- *transitioning to whole grains at the beginning of the school year*
- *use of brown rice and whole wheat pastas (USDA commodity products)*

Participating HUSSC Gold school food service personnel were asked if they currently served any whole grain food or flour items available from USDA-FNS (Figure 10). In response, nearly two-thirds (64%) indicated that they did not serve any whole grain food or flour items from USDA-FNS. The remainder of respondents (36%) indicated that they did serve whole grain food and flour products from USDA-FNS.

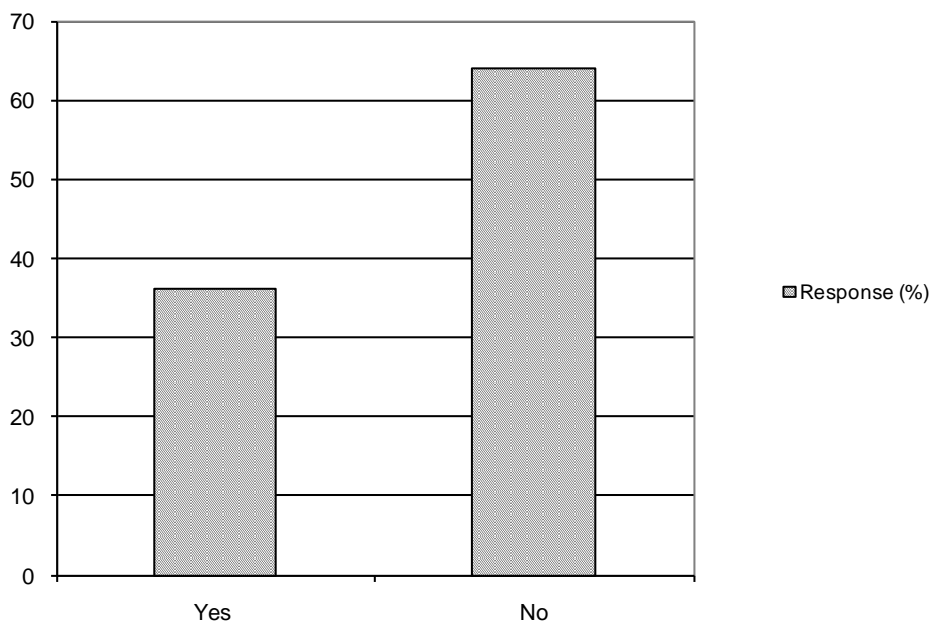


Figure 10. Do you serve any of the whole grain food items or flour available from USDA-FNS? *Response (n=28)*

Whole wheat flour was the primary item participants (36%) received from USDA-FNS. Other whole grain items used from USDA were: whole wheat pasta (23%), brown rice (18%), whole grain bread (9%), whole grain sandwich bread (5%), oats (5%), and dried peas and beans (5%) (Figure 11).

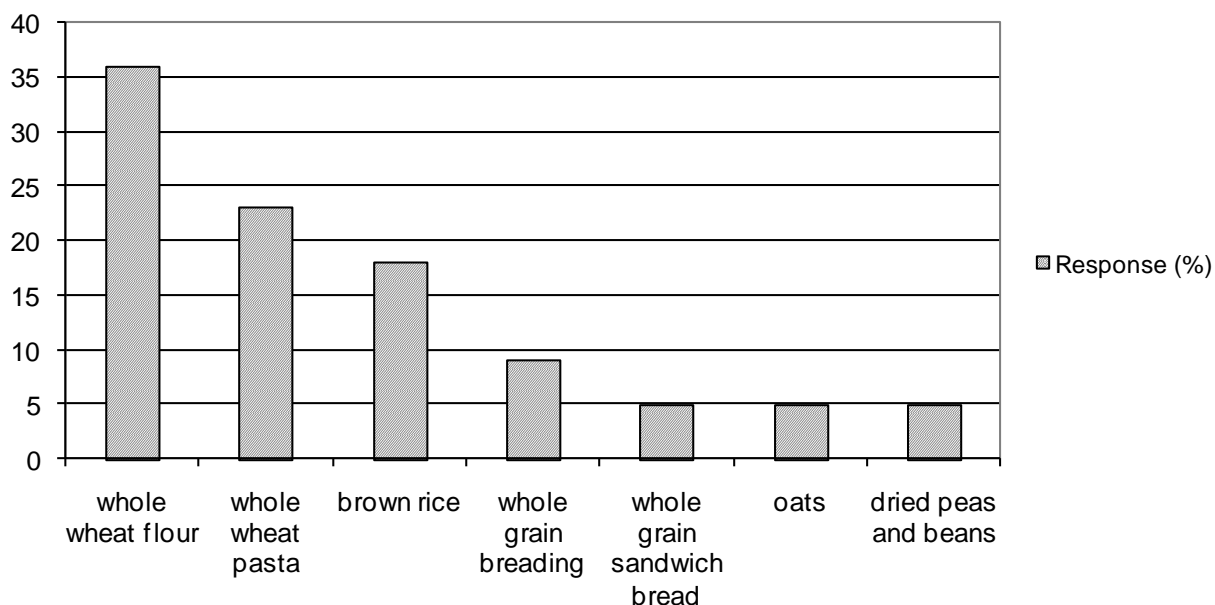


Figure 11. If you did serve whole grain food items or flour available from USDA-FNS, which items did you use? *Response (n=22)*

Barriers

Survey participants indicated some challenges were experienced as they transitioned from serving refined to whole grain foods on their school menus (Figure 12). When asked “from a food service directors perspective, how easy or difficult has it been for you to find and purchase the whole grain foods served in your schools”, 43% of survey participants indicated that purchasing whole grain foods for their school meals was “somewhat easy but with some challenges along the way”. Eighteen percent of surveyed food service directors reported that finding and purchasing whole grain food products to serve in their school meals was a “difficult” process while only 4% indicated “very difficult”. Overall, 65% of HUSSC Gold school food service directors reported facing challenges or difficulties when locating and purchasing whole grain food products to serve in their school meals.

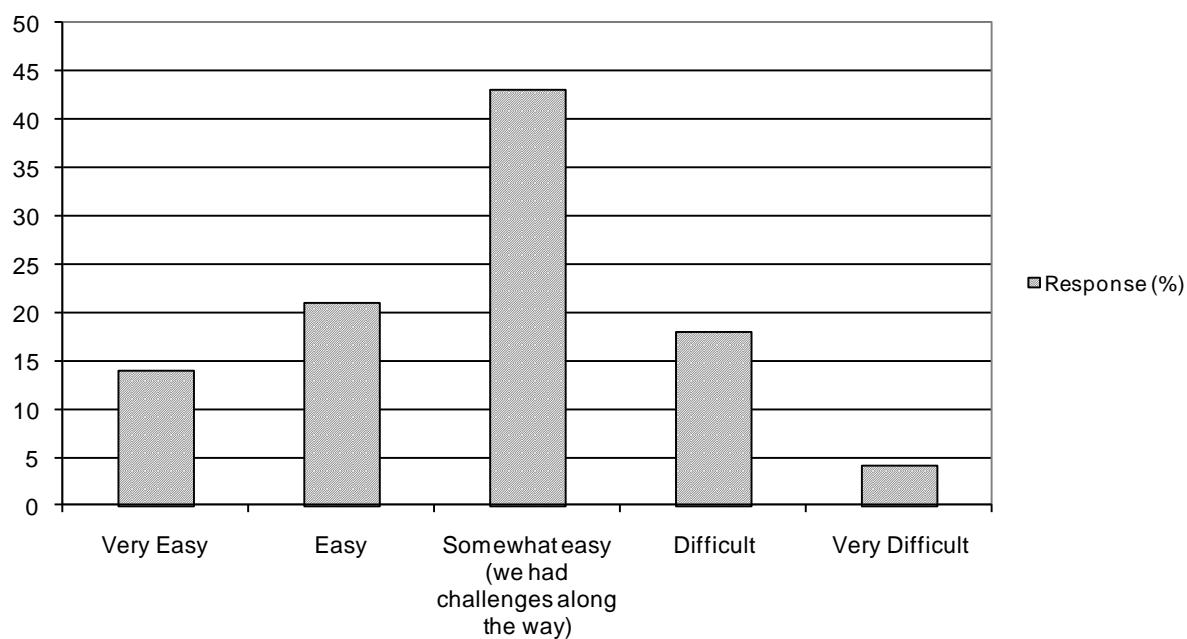


Figure 12. From a food service director's perspective, how easy or difficult has it been for you to find and purchase the whole grain foods served in your schools? *Response (n=28)*

School food service directors that experienced difficulty when locating and purchasing whole grain products indicated that product labeling made it difficult to determine if a product was truly a whole grain food product according to the HUSSC criteria (Table 5). Higher cost of whole grain items compared to their refined counter parts, lack of product availability from both state and commodity vendors, and lower student acceptance of whole grain food products also represented “difficulties” experienced by survey participants.

Table 5. If you answered "difficult" or "very difficult" when finding and purchasing whole grain foods served in your schools, please tell us why.

Response (n=9)	Percent
Products labeled as whole grain are really not whole grains	33
Student acceptance of purchased whole grain products	11
Government commodities do not include whole grains	11
Barley and whole grain sub buns are difficult to obtain	11
Few bread products available	11
Cost	11
Products not available from supplier on state bid	11

Survey participants were asked to evaluate the level of success they had experienced when obtaining whole grain products from their vendors (Figure 13). Responses indicated that 30% were very successful when obtaining whole grain products from their vendors and 67% were “somewhat successful” but experienced challenges along the way. A small percentage of survey respondents (4%) indicated that they were unsuccessful when obtaining whole grain products from their vendors.

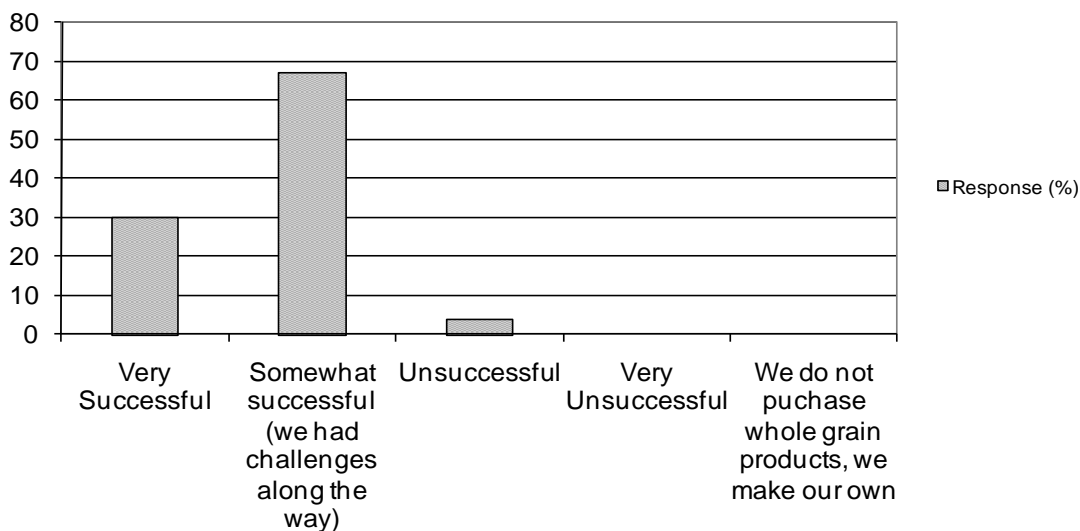


Figure 13. How successful have you been in obtaining whole grain products from your vendors? *Response (n=27)*

HealthierUS School Challenge Gold school food service directors were asked how easy or difficult it was to meet the criteria for the HUSSC (Figure 14). In response, more than half (64%) of survey participants indicated that meeting the criteria for the HUSSC was “somewhat easy” but did experience challenges along the way. Approximately 21% of participants experienced difficulty when meeting HUSSC criteria. Eleven percent of respondents indicated that it was “very easy” when meeting HUSSC criteria and 4% of respondents felt meeting the criteria was “easy”. The majority of responses indicate that although there were challenges when meeting criteria for the HUSSC, school food service directors are willing to adapt and make changes to their school lunch program to overcome difficulties experienced and benefit the student population.

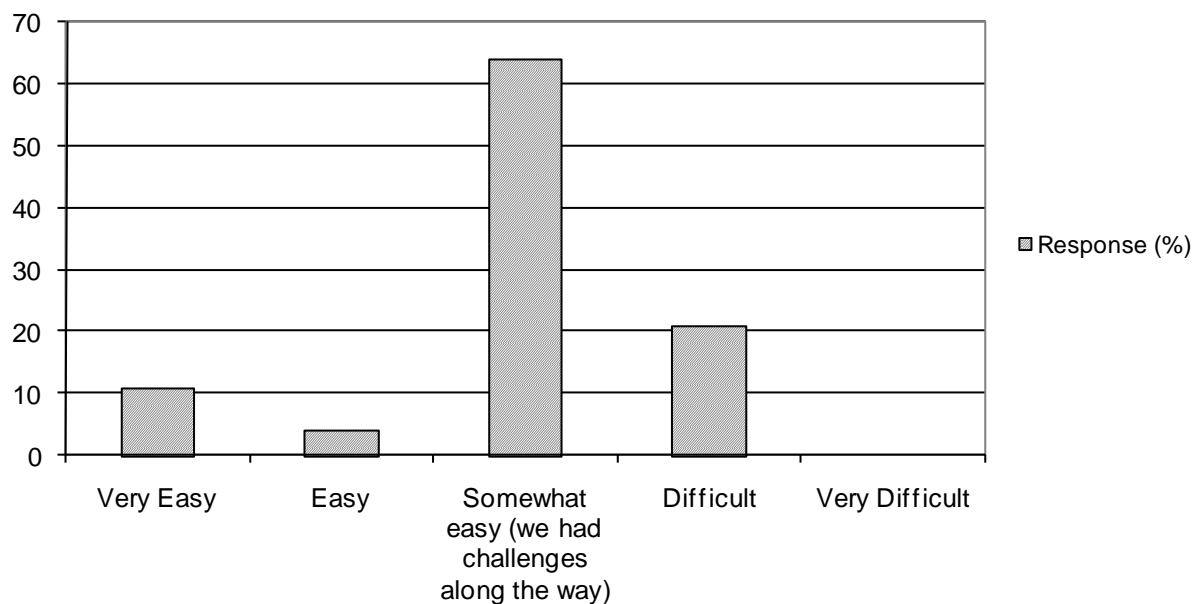


Figure 14. How easy or difficult was it to meet the criteria for the HealthierUS School Challenge? *Response (n=28)*

The application process for HUSSC and providing a daily serving of whole grain in their school meals were the major reasons for difficulties experienced when meeting the criteria for the HUSSC (Table 6). Other responses included: a low student acceptability of whole grain items, making necessary recipe adjustments, incorporating whole grains into a main entrée, and the need for nutrition education curriculum for classroom use. The above listed responses represented barriers experienced by surveyed school food service professionals when meeting the criteria for the HUSSC.

Table 6. If you answered “difficult” or “very difficult” when meeting the HealthierUS School Challenge criteria, please tell us why.

Response (n=9)	Percent
Low student acceptability of whole grain items (taste, texture, and color differences)	11
Providing a daily serving of whole grain	22
Recipe adjustments	22
Incorporating whole grains into main entrée	11
Nutrition education curriculum for use in classroom	11
Application process for HealthierUS School Challenge	22

Over half of respondents (52%) indicated that student acceptance of whole grain products represented a significant challenge when incorporating whole grain products into their school meals (Figure 15). Additional challenges experienced by school food service professionals seeking to transition from refined to whole grain foods included: higher cost of whole grain foods compared to the refined grain counterpart (11%), availability of whole grain products to be purchased by school foodservice professionals (11%), difficulty with recipe adjustments (11%), identification of a true whole grain food (4%), and offering one whole grain food daily (7%). In contrast, 22% of participants indicated no challenges were experienced when incorporating whole grains into their school meals.

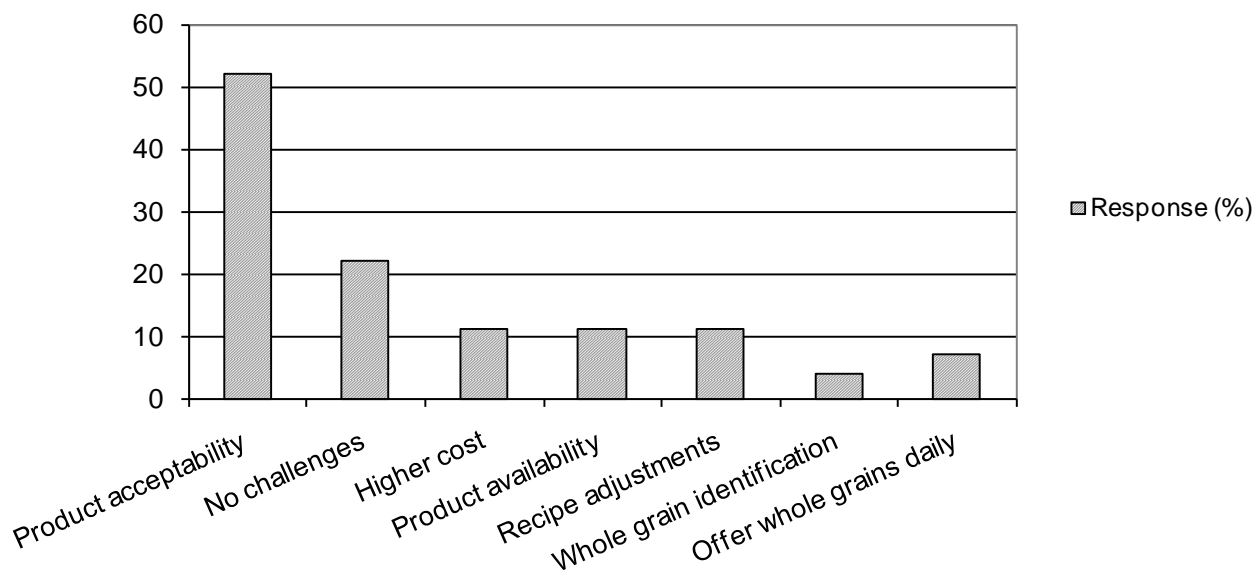


Figure 15. What were specific challenges that you have had to overcome when you added whole grain foods into your menus? *Response (n=27)*

The whole grain component of the HUSSC represented an area with significant challenges and was identified by 39% of participants as the most difficult of the HUSSC criteria to meet (Figure 16). Twenty-five percent reported that the legume component was the most difficult component to meet and none of the respondents indicated that the fruit and vegetable component was the most difficult component of the HUSSC criteria to meet. Other areas of difficulties experienced according to “other responses” by 36% of participants included: the HUSSC application process, serving entrees with less than 40% calories from fat, cost, physical activity, serving dark green or orange fruits and vegetables and nutrition education information.

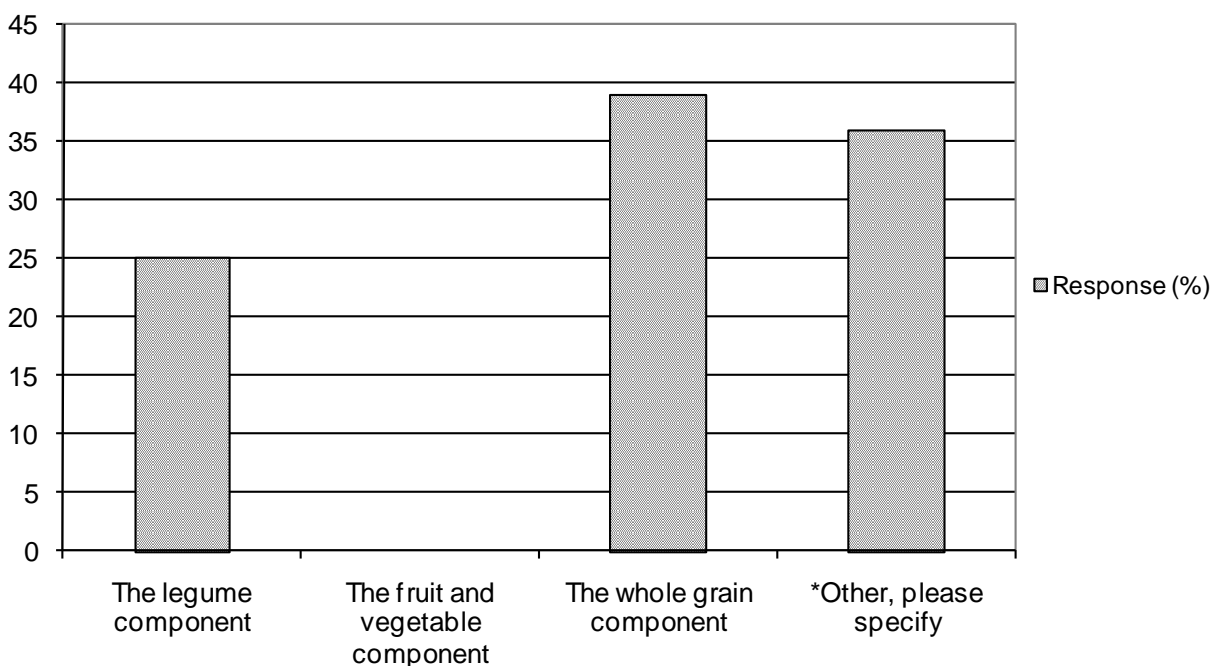


Figure 16. What was the hardest component of the HealthierUS School Challenge criteria to meet? *Response (n=28)*

**other responses include: Entrees under 40% calories from fat, application process, expense, physical activity, dark green or orange fruits and vegetables, obtaining nutrition education information, and physical activity information, and none.*

Survey participants were asked to identify what type of information they would like to see on grain food labels to aid in understanding if the product was a 100% whole grain food (Figure 17). Results indicated participants were seeking an identifier placed on a food label that accurately determines if a food is a true whole grain product that will meet the criteria set by the HUSSC. The two most frequently chosen responses included “a product label that indicated the percent of whole grain per serving” (32%) and “a product label that carries the Whole Grain Council Stamp” (32%). Eighteen percent of survey respondents were not sure what information they would like to see on whole grain food label, while 11% indicated that information on a

product label that indicated the grams of whole grain per serving would be useful when understanding if a product was a 100% whole grain food.

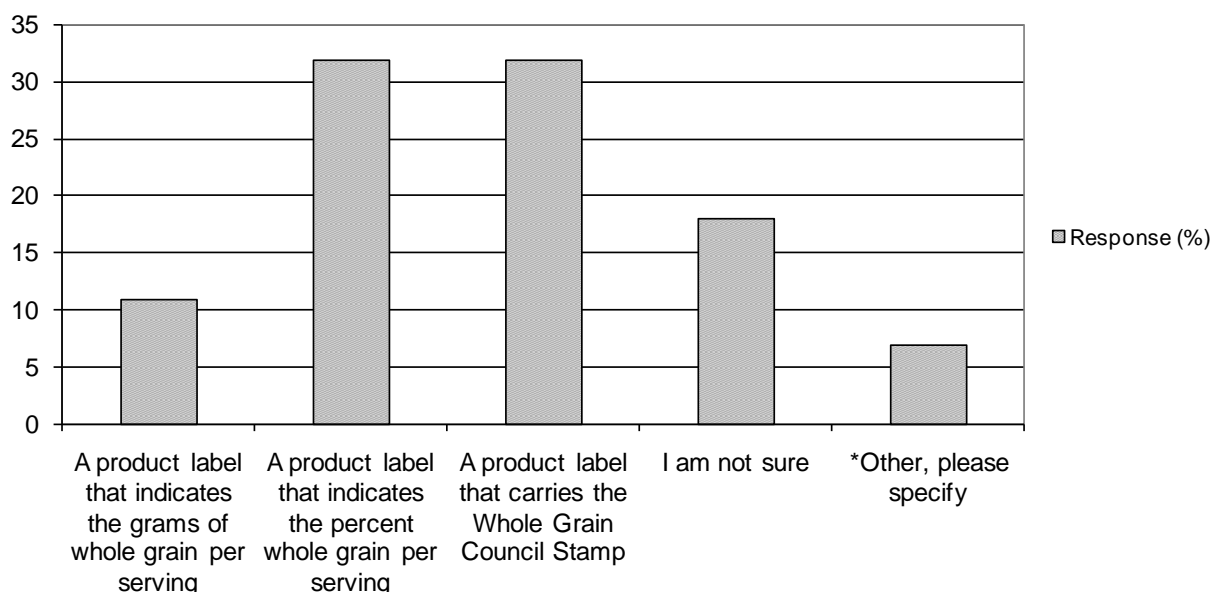


Figure 17. What type of information would you like to see on grain food labels that would help you understand the product is a 100% whole grain food?
Response (n=28)

**other responses include: “depends on what is around the road for requirement” and “clearly identifying whole grain as the first ingredient*

Educational and Promotional Tools

HealthierUS School Challenge Gold school food service professionals were asked what types of nutrition education tools they used in order to promote whole grain food consumption in their schools (Figure 18). In response, 32% of survey participants indicated that they currently do not have any educational materials, 25% indicated they have developed their own educational materials, and 21% indicated that they ordered educational materials off of the internet. Twenty-

one percent of survey respondents also indicated that “other” types of nutrition education tools were used to promote whole grain food consumption in their school meals.

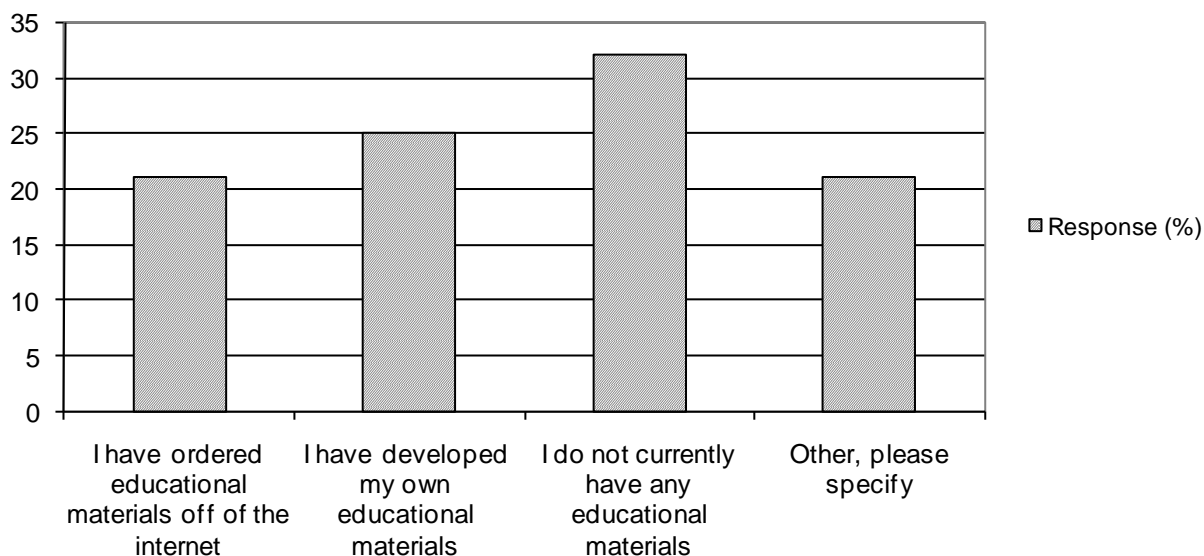


Figure 18. What types of nutrition education tools do you use in order to promote whole grain food consumption in your schools?

Response (n=28)

**other responses include: Chartwells Nutrition Education, newsletters and menus, materials from SNA and ADA, and Idaho wheat commission materials*

Survey participants were asked to determine what types of promotional materials they would like to use in their schools (Figure 19). Seventy-four percent requested signs to post in cafeteria serving lines, as well as posters, for promotional material in their schools. Thirty-two percent of survey participants indicated that parent newsletters, fliers, and handouts would be useful. Lesson plans, classroom materials/curriculum, and workbooks would be useful to 26% of survey respondents. Additionally, Power Point presentations and presentation templates used to customize lesson plans were indicated to be useful by 16% of respondents. Sixteen percent of surveyed individuals indicated that promotional materials, give away items, and magnets would

be useful promotional materials in their schools. Eleven percent of surveyed school food survey professionals indicated a need for promotion of whole grains and fruit and vegetable promotion. Eleven percent indicated they were “not sure” of types of promotional materials they would like to use in their schools.

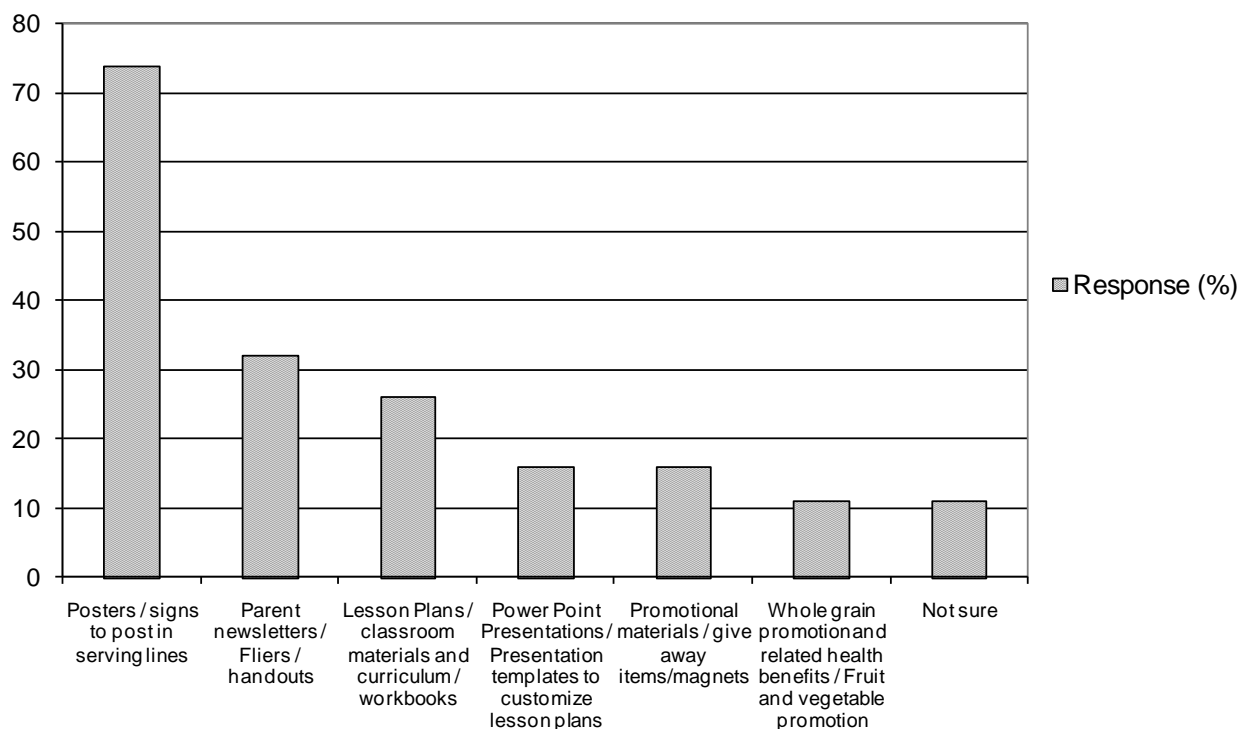


Figure 19. What types of promotional materials would you like to see in your schools? *Response (n=19)*

At the end of the survey participants were given the opportunity to provide additional comments and suggestions (Table 7). Of the seven responses received, education was a major theme; to educate the food industry, a need for adult nutrition education, and use of television marketing to educate the public on the benefits of whole grain consumption. Two respondents stated cost of whole grains was an issue. Additionally, it was mentioned that “the rate of

acceptance is improving” and that “kids are slowly choosing whole wheat over refined products”.

Table 7. Please include any additional comments and suggestions here:

Response (n=7)
Educate the food industry
TV marketing
Adult nutrition education
Cost
Important enough to tolerate the increase in meal cost and still continue serving whole grains, fresh fruits, and vegetables daily
Would appreciate USDA to offer a variety of healthy foods and not the processed foods
The rate of acceptance is improving. Kids are slowly choosing whole wheat over refined products

Survey participants were asked if they had performed any training with their food service personnel on how to select, prepare, or serve whole grain foods (Figure 20). Sixty-three percent reported they had trained food service personnel on methods to select whole grain foods, 73% of survey respondents indicated they had trained food service personnel how to prepare whole grain foods, and 77% of food service personnel were trained to serve whole grain foods. These results indicate the importance of training for school food service personnel when transitioning from a refined to whole grain food product.

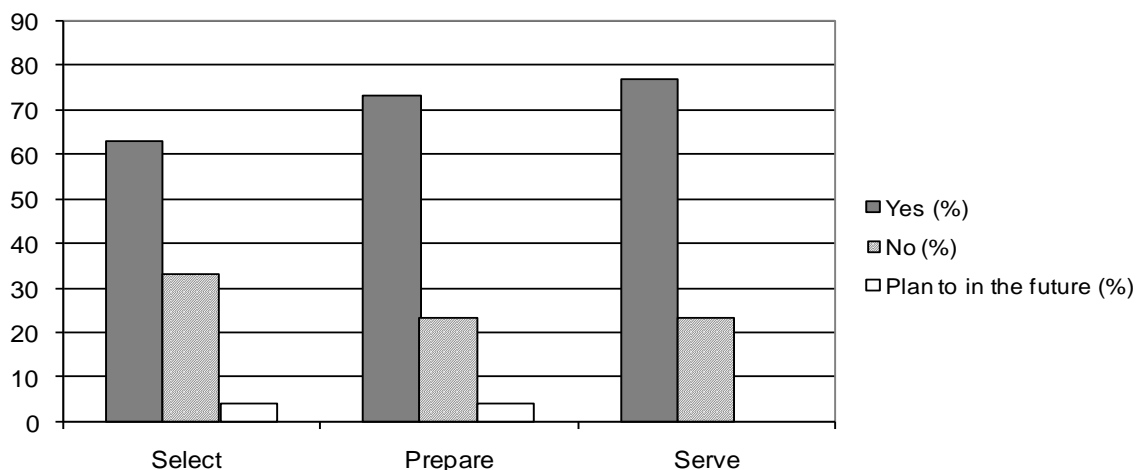


Figure 20. Have you performed any training with your food service personnel on how to select, prepare, or serve whole grain foods?
Response (n=27)

USDA-FNS Website Information

When asked to rate the usefulness of the USDA-FNS website in terms of its resource material on whole grains 39% indicated that whole grain resource material on USDA-FNS website was “useful/I always refer to them” (Figure 21). Whereas, 18% rated the USDA-FNS online whole grain resource material as “somewhat useful/I refer to them most of the time”, and 29% of survey participants indicated that the whole grain resource material was “ok/ I sometimes refer to them”. The USDA-FNS online whole grain resource material was rated “not very useful/I rarely refer to them” by 11% of survey respondents and 4% indicated that the website was “not useful at all/ I never refer to them”.

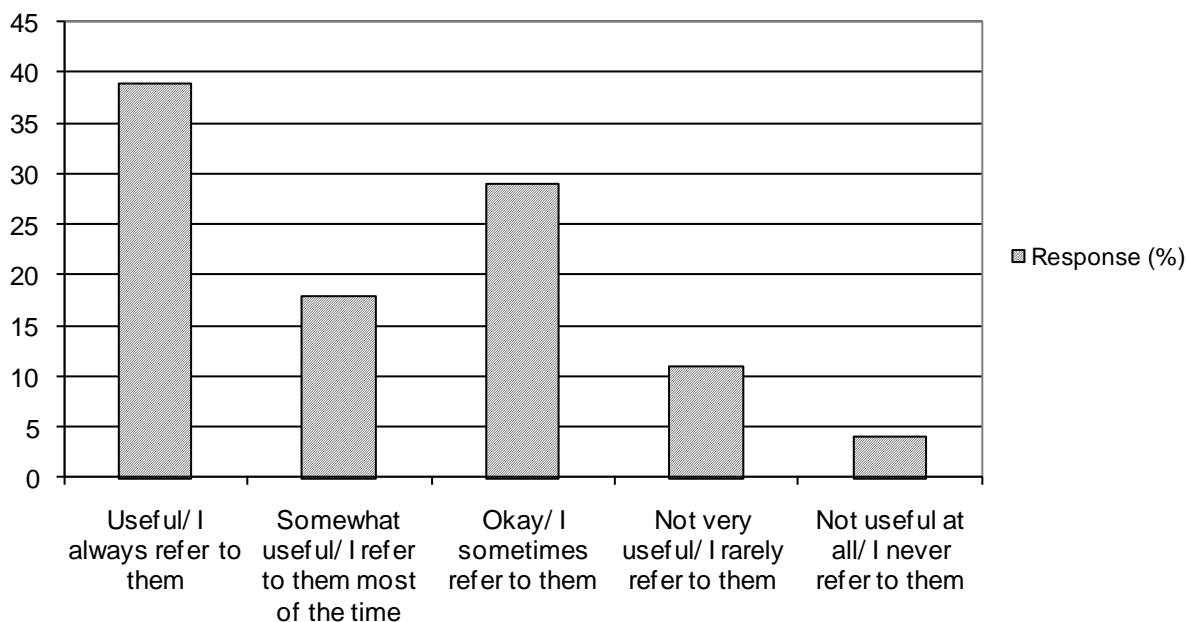


Figure 21. Please rate the usefulness of the current USDA-FNS website in terms of its resource material on whole grains. *Response (n=28)*

Access to information regarding whole grain food items currently available for purchase by school food service professionals, was indicated to be a useful resource by a significant portion (86%) of participants (Figure 22). This overwhelming response suggested possible difficulties encountered when locating and purchasing acceptable whole grain products to serve in their school meals. The remaining 14% of survey participants indicated “no”, information provided on the USDA-FNS website would not be useful.

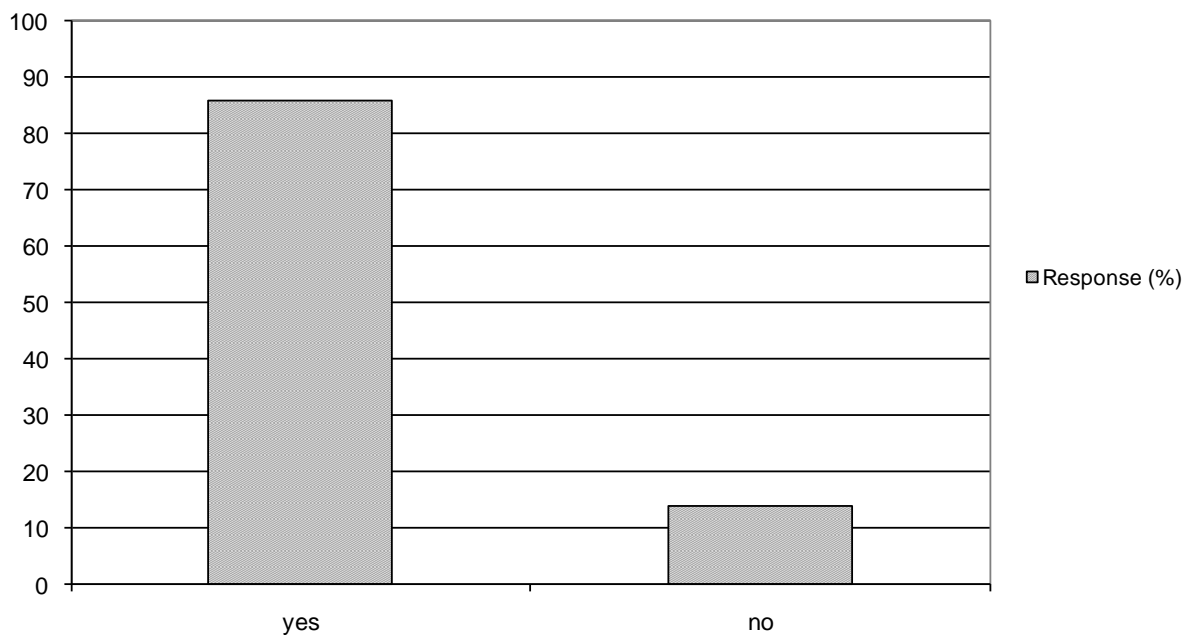


Figure 22. The USDA-FNS website does not currently offer information concerning commercially available consumer whole grain food products that are also available to the school lunch program. Would adding this material to the website be useful to you? *Response (n=28)*

HealthierUS School Challenge Gold school food service professionals indicated that having access to whole grain educational materials from the USDA-FNS website would be most useful (78%) (Figure 23). Another large percentage of responses (63%) indicated that access to whole grain promotional materials would also be useful. The need for training of staff (in English) on how to select, prepare, or serve whole grain foods was considered necessary by over half of survey participants (59%). Seven percent of survey participants also indicated that the same training available in Spanish would be useful.

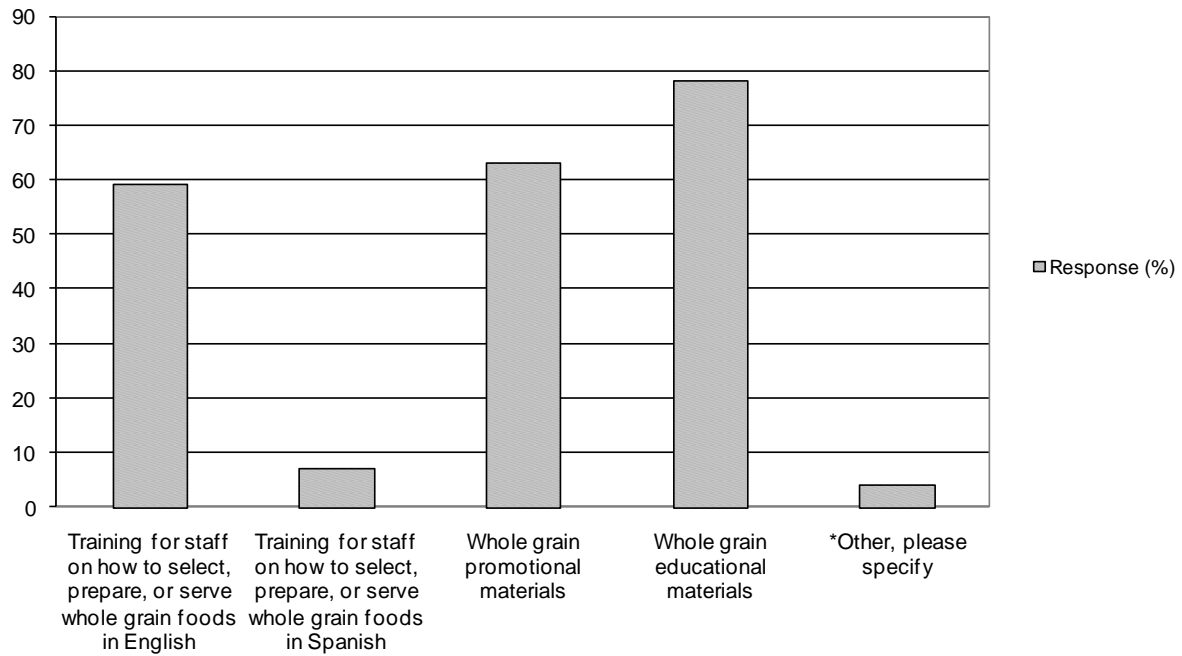


Figure 23. Which of the following items would be useful for you and your staff if you could access this information on the USDA-FNS website? (Check all that apply). Response ($n=27$). *Other responses include: educational materials for both students and staff

CHAPTER V

DISCUSSION

This is the first study to examine the indicators of success for the HUSSC when incorporating whole grain foods into gold rated elementary school meals. Barriers to providing whole grains in schools that have been previously reported in the literature include: whole grain product acceptability, cost of whole grain foods, and labeling issues (17,18,22). In addition to these barriers, food service professionals participating in this survey also indicated students repeated exposure to new foods, HUSSC application process, purchasing of whole grain foods, and education of staff and students were factors playing a role in successful whole grain incorporation into schools.

Although these barriers have been recognized, currently there is limited knowledge available to determine specific methods utilized by school food service professionals when addressing these challenges. Therefore, findings generated from this study could provide technical assistance to other school districts wanting to align their school meals more closely with current dietary recommendations by incorporating whole grains into school meals.

Product Acceptability

According to our survey respondents, product acceptability was mentioned frequently as a significant barrier encountered when transitioning from a refined product to a whole grain food. Similar issues have been cited in other studies, as well (22,39). Lower student preference for whole grain foods (46) can be attributed to a perceived inferior taste, texture, and color associated with these foods (18). Participating school food service professionals also recognized

issues regarding taste, texture, and color of whole grain products when compared to refined, and dealt with this issue by serving a significant portion of whole grain products containing 51-75% whole grain content (Figures 3 and 4). Thus foods with a lower whole grain content (but still meeting HUSSC guidelines) may yield a more acceptable product to students. Once students have adapted to a partial blend product, school food service professionals have the opportunity to increase whole grain content more closely to 100% throughout the school year.

Additionally, when recognizing acceptability issues with serving new whole grain foods, participants reported an increase in meal consumption by utilizing a gradual incorporation approach to menu new whole grain food products. This “gradual approach” included transitioning from refined products to whole grain foods at the beginning of the school year instead of during the middle of the semester as shown in Figure 9. In combination with this, many food service professionals also gradually changed the whole grain content of foods throughout the semester. They first started with a higher percentage of refined to whole grain ratio in the food and increased the whole grain content over time to reach 51% or greater (as this is the minimum requirement to be considered a whole grain food) (2). Adjusting the whole grain content of a food was accomplished either through recipe modifications or locating and purchasing products with varying whole grain content (Figure 8). Gradual incorporation of new foods in school meals has also been discussed by others as a method to increase student acceptance of unfamiliar foods (53).

Repeated Exposure to New Foods

Previous studies recognized that children usually require several exposures to a new food before the food item is easily accepted. As a result of these observations, these authors emphasized offering new food items frequently and over an extended period of time as a method to increase consumption (6,33,53). Similar to these studies, our survey participants recognized the need to be persistent in their attempts to incorporate a new food product into their school meals and thus offered new whole grain food items frequently until acceptance level increased among students. School food service professionals surveyed in this study “offered a choice between whole wheat and white breads until students accepted the whole wheat all of the time” (Table 3). As one survey participant shared, “The rate of acceptance is improving. Kids are slowly choosing whole wheat over refined products” (Table 7). These actions provide evidence that continually offering whole grain foods in school meals and being persistent in doing so, may represent a critical method used to increase consumption levels in school meals.

Purchasing

Survey participants also indicated challenges regarding greater expense (Figure 15) of whole grain foods as well as difficulty locating and purchasing whole grain foods for their school meals (Figure 12). Increased cost combined with difficulty obtaining desirable whole grain food products could hinder the placement of whole grain foods into school meals. Of the purchasing issues, survey participants reported difficulty when identifying a true whole grain as “some products labeled as whole grains are really not whole grains” (Table 5). Difficulties identifying whole grain foods based on product label led participants to indicate that the ingredient list as shown in Figure 1, is a useful identification tool and a product label “indicating the percent of

whole grain per serving” would be an effective measure to identify a true whole grain food (Figure 17). Difficulties identifying a true whole grain food have been addressed by Mancino et al., also recognizing a need for a more uniform labeling standard to more easily identify whole grain foods and increase consumption (54).

Application Process and Whole Grain Criteria

Another barrier our participants shared with us was difficulty with the application process for becoming a HUSSC Gold elementary school (Table 6). This issue has been addressed by USDA-FNS and a streamlined version of the application process is now available on-line (55). During the application process, the whole grain component of the HUSSC represented a significant challenge and was noted by our participants as the most difficult portion of HUSSC criteria to meet for gold level recognition (Figure 16). Second to the whole grain component, our participants indicated that requirements for the dark green and orange vegetables, as well as the legume component of the HUSSC were also difficult to meet. Realizing difficulties exist when incorporating foods from these categories into school meals, USDA-FNS initiated the “Recipes for Healthy Kids Challenge” in September 2010 which sought to provide students appealing food options by creating new recipes to test, serve, and evaluate in school meals. Recipes for this challenge could be submitted in the following three categories: whole grain foods, dark green and/or orange vegetables, and dry bean and peas (legumes) (56).

Education

Education in whole grain identification, purchasing, and preparation was needed by our participants to successfully incorporate whole grains into their school meals. The HUSSC Gold food service professionals participating in our study were resourceful when developing strategies and methods of education concerning whole grains in order to successfully incorporate whole grains onto their school menus. These school food service professionals were able to identify a true whole grain (Table 1) by indicating a whole grain contains “all three parts of the grain” (bran, germ, and endosperm) and successfully identified a whole grain food product by recognizing the first/primary ingredient is marked as “whole” or whole grain. Since these individuals serve as “gatekeepers” and determine which foods are included in the school lunch menu (47), their ability to locate and identify acceptable products and products that meet HUSSC whole grain requirements have made them successful when incorporating whole grain foods into their school meals.

The need for employee training regarding whole grain incorporation methods was reported by half of our survey participants. Training for staff when selecting, preparing, and serving whole grain foods (Figure 23) is considered vital since these factors may influence students’ acceptance of these foods (57). Since many survey participants had no educational materials and had to purchase or develop their own, these individuals indicated a need for educational and promotional tools to aid the whole grain incorporation process (Figure 18).

Although our participants were able to successfully incorporate whole grain foods into their school meals, our respondents requested whole grain promotional tools to aid their efforts. Whole grain promotional materials requested include: posters in the school lunch serving line, classroom materials and workbooks, and newsletters and handouts for parents (Figure 19).

Methods of educating parents were also listed as a promotional material requested by our participants (Figure 19). Lesson plans or curriculum materials for educating and promoting whole grain foods in schools were an additional request by our participants. Since our participants have achieved a HUSSC Gold rated status, it can be assumed that these individuals were creative and resourceful when working without an abundance of whole grain promotional materials. However, for whole grain incorporation to become more widespread throughout schools participating in school meal programs, development of promotional materials could ease the transition from refined to whole grain foods served.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Interest in whole grain incorporation methods utilized by school food service professionals has stemmed largely from national dietary policy recommendations (2) and the potential dietary influence that school meals have on nutritional outcomes and disease prevention in children (18,2147). The 2005 Dietary Guidelines for Americans has recommended an increase in whole grain consumption to 3 servings daily (2). Since school meals have the opportunity to serve 2 out of 3 daily meals to children, this setting represents an effective avenue to increase whole grain consumption in school aged children.

Although these recommendations exist, implementation of these dietary changes has been faced with many challenges (20,46). In regards to whole grain food products, school food service professionals have experienced difficulties with whole grain acceptability among students, identifying true whole grain products, and increased cost of whole grain foods.

However, due to the persistence and resourcefulness demonstrated by HUSSC Gold school food service professionals, these individuals have overcome existing barriers and successfully menued acceptable whole grain foods in their school meals. Among their incorporation strategies were: a gradual approach to menu changes, recipe modifications, ability to identify whole grain products provided through vendors, and increasing their employee training to prepare and serve whole grain foods. Their success was measured by the ability to menu one whole grain food item every day of the week, as required by the HUSSC. These individuals moved their schools closer to meeting dietary recommendations and demonstrated that serving whole grain foods in school meals is an attainable goal for other schools to achieve.

Since implementation and data collection of this survey, there has been an increase in schools achieving the HUSSC Gold status. Child nutrition has represented a growing field of interest, particularly when offering more nutritionally sound food choices in school meals. This survey served as a tool to determine methods used by school food service professionals who have been the most successful in this field when increasing the quality of foods served in their school meals. Results from this survey have been presented at USDA-FNS headquarters in Alexandria, VA and are currently being disseminated through the USDA-FNS website as recommendations for all schools wishing to participate in the NSLP and HUSSC.

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