This white paper examines the relationships of a sampling of stakeholders of the grain-based foods supply chain, namely growers, manufacturers, distributors, and school foodservice, as they work together to ensure the smooth and seamless delivery of whole grain foods into schools. Each player in the whole grain food system has a role and impact, and benefit is maximized when people are willing to collaborate.
Task Force Members and Advisers

Renee Rosen  
Lecturer/ Researcher  
University of Minnesota

Paul Darrow  
Business Development Director  
Kellogg Company

Paul Lynch  
Executive Chef Paul Lynch  
Radisson Plaza Hotel Minneapolis

Mary Ellen Wagner  
Product Promotion Director  
South Dakota Wheat Commission

Kristine Igo  
Assistant Director  
Healthy Foods, Healthy Lives Institute  
University of Minnesota

Julie Boettger  
Director of Food and Nutrition Services  
School City of Hammond

Len Marquart  
Associate Professor  
Food Science and Nutrition  
University of Minnesota

Denise Hauge  
Director  
Grains for Health Foundation

Wendy Knight  
Coordinator of Food and Nutrition Services  
Independent School District 196

Jessica Wellnitz  
Senior Food Technologist  
Cargill Bakery Category

Stephanie Cooks  
Nutritionist  
USDA-FNS

Advisers

David Garvin  
Adjunct Assistant Professor  
Agronomy/Plant Genetics  
University of Minnesota

Barbara Griffiths  
Food and Nutrition Services Supervisor  
Independent School District 196

Gary Vonck  
Vice President Education Sales  
KeyImpact Sales & Systems

Pam Fleming  
Director, Education Sales  
Fox River Foods, Inc

Shelly Melroe  
Confluence, LLC
WHOLE GRAINS IN SCHOOLS

Introduction
The status and future of whole grains changed dramatically with the January 2012 release of the U.S. Department of Agriculture (USDA) Nutrition Standards in the National School Lunch and School Breakfast Programs (NSLP and SBP). With whole grain foods required on school breakfast and lunch menus as of July 1, 2012, whole grain-rich foods quickly transitioned from aspirational to a required part of school meals. The food industry, anticipating the new legislation and in response to a report on school meals by the Institute of Medicine, School Meals: Building Blocks for Healthy Children, increased the development and production of whole grain products for schools in the period leading up to the new guidelines. It now is incumbent on members of the supply chain for whole grain-rich foods in schools to develop relationships and lines of communication for working together to create an efficient and effective system.

The school foodservice industry is one of the most complex food business segments. It has a high number of purchase decision influencers, receives unprecedented scrutiny from the community, and utilizes a supply chain system that includes the USDA and group purchasing organizations in addition to the standard food distribution system, all while feeding tens of millions of school children every school day. It is critical to successfully manage this supply chain to reduce cost and increase efficiency.

One must view whole grains in schools from a supply chain perspective because this approach can consider all stakeholders from both supply and demand sectors, and facilitates a number of critical process steps that are necessary for delivering whole grain foods to schools and their students. The whole grain supply chain provides a flexible framework for analysis, creates a common language for all stakeholders, encourages cross-functional collaboration and planning, and emphasizes horizontal rather than vertical integration of all involved.

Stakeholders
The Future of Grains in Schools Task Force, in conjunction with research conducted at the University of Minnesota, identified 10 key stakeholders in the school whole grains supply chain: wheat breeders and geneticists, growers, millers, government agencies, manufacturers, local bakers, local food supply, school food buyers groups and distributors, and school foodservice. Students are not included because they sit on the demand side of the chain, but they are the primary recipient of whole grain foods and make decisions that affect the viability of the overall system.
This white paper examines the relationships of a sampling of those stakeholders, namely growers, manufacturers, distributors, and school foodservice, as they work together to ensure the smooth and seamless delivery of whole grain foods into schools. Each player in the whole grain food system has a role and impact, and benefit is maximized when people are willing to collaborate.

**Goals**

The goals of this white paper are to encourage stakeholders in the foodservice supply chain to work together to support whole grains in schools, identify opportunities for success and barriers to overcome, showcase strategies along the whole grains supply chain, motivate involved parties to continue to improve the taste and quality of whole grain foods for schools, and manage product costs. A streamlined and efficient system, including effective communication, a common understanding of the school food system, and clarity of ingredients in whole grain-rich foods, will ensure that students receive the healthiest grain foods possible while eating at school.

**Whole grains, defined**

As defined by the Whole Grains Council, whole grains and foods made from them contain all the essential parts and naturally-occurring nutrients of the entire grain seed. Whole grain ingredients such as flours must contain 100 percent of the grain kernel, including its bran, germ, and endosperm. Consumers can select whole grain products by looking on the label for 100 percent whole wheat or whole grain; ingredient lists also
are a tool for identifying whole grain foods based on prominent position on the list and ingredient name, including such terms as cracked or crushed wheat (See Table 1).

**Table 1. Common identifiers for whole wheat and whole grain**

<table>
<thead>
<tr>
<th>Common Identifiers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cracked wheat</td>
</tr>
<tr>
<td>Crushed wheat</td>
</tr>
<tr>
<td>Whole-wheat flour</td>
</tr>
<tr>
<td>Graham flour</td>
</tr>
<tr>
<td>Entire-wheat flour</td>
</tr>
<tr>
<td>Bromated whole-wheat flour</td>
</tr>
<tr>
<td>Whole durum wheat flour</td>
</tr>
<tr>
<td>... berries</td>
</tr>
<tr>
<td>Whole ..., whole grain ...</td>
</tr>
<tr>
<td>Groats</td>
</tr>
<tr>
<td>Oatmeal</td>
</tr>
<tr>
<td>Brown rice</td>
</tr>
<tr>
<td>Wild rice</td>
</tr>
<tr>
<td>Less common whole grains (amaranth, buckwheat, Kamut®, millet, quinoa, spelt)</td>
</tr>
</tbody>
</table>

The definition of whole grain products to be served in schools is more complicated. The 2010 IOM report2 was the first to spell out recommendations for whole grains in schools in an effort to better align school meals with the Dietary Guidelines for Americans. The Final Rule issued on January 25, 2012 and based on the Healthy, Hunger-Free Kids Act of 20101 set forth the following requirements, as defined in an April 26, 2012, memo on grain requirements7:

- For lunch, beginning July 1, 2012 (SY 2012-2013), through June 30, 2014, half of the grains offered during the school week as part of NSLP must meet the whole grain-rich criteria. Beginning July 2, 2014, (SY 2014-2015), all grains must meet the whole grain-rich criteria.
- For SBP, beginning July 1, 2013 (SY 2013-2014), half of the grains offered during the school week must meet the whole grain-rich criteria. Beginning July 1, 2014, (SY 2014-2015), all grains must meet the whole grain-rich criteria.
- For both NSLP and SBP, all grain foods must follow weekly grains ranges and the daily minimum requirement (Table 2).

**Table 2. USDA grain food regulations for school meals, servings in oz eq per week (minimum per day)**

<table>
<thead>
<tr>
<th></th>
<th>Grades K-5</th>
<th>Grades 6-8</th>
<th>Grades 9-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>7-10 (1)</td>
<td>8-10 (1)</td>
<td>9-10 (1)</td>
</tr>
<tr>
<td>Lunch</td>
<td>8-9 (1)</td>
<td>8-10 (1)</td>
<td>10-12 (2)</td>
</tr>
</tbody>
</table>

Up to 2 oz eq per week can be in the form of a grain-based dessert.
The April 26, 2012, memo also defines whole grain-rich items for schools as foods that contain 100 percent whole grain or contain a blend of whole grain meal and/or flour and enriched meal and/or flour of which at least 50 percent is whole grain. Whole grain-rich products must contain at least 50 percent whole grains and the remaining grain, if any, must be enriched. School Food Authorities (SFAs) also can use a checklist to ascertain that a grain product is whole grain-rich (Table 3). Conversations with school foods service directors suggest that Element 2c, identifying whole grain-rich foods based on position of whole grains on the ingredient list, is commonly used in schools. It presents an easy way for schools to determine which foods qualify and is less onerous on manufacturers because they do not have to list grams of whole grain or a whole grain claim.

Table 3. Criteria for whole grain-rich school foods

<table>
<thead>
<tr>
<th>Element #1: A serving of the food item must meet portion size requirements for the Grains/Breads component as defined in Food and Nutrition Service (FNS) guidance. AND</th>
<th>Element #2: The food must meet at least one of the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. The whole grain content oz eq must be ≥ 8 grams. This information may be determined from information provided on the product packaging or by the manufacturer, if available.</td>
<td>a. The whole grain content oz eq must be ≥ 8 grams. This information may be determined from information provided on the product packaging or by the manufacturer, if available.</td>
</tr>
<tr>
<td>b. The product bears the Food and Drug Administration (FDA)-approved whole grain health claim on its packaging -- “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.”</td>
<td>b. The product bears the Food and Drug Administration (FDA)-approved whole grain health claim on its packaging -- “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.”</td>
</tr>
<tr>
<td>c. Product ingredient listing lists whole grain first. For non-mixed dishes such as breads and cereals, whole grains must be the primary ingredient by weight, with the exception of water. When the whole grain content comes from multiple ingredients, the combined whole grain ingredients may be the primary ingredient by weight even though a whole grain is not listed as the first ingredient. For mixed dishes such as pizza and corn dogs, whole grains must be the primary grain ingredient by weight and be the first grain ingredient listed. For foods prepared by school food service, the recipe will guide determination of whether the total weight of whole grain ingredients exceeds the total weight of non-whole grain ingredients.</td>
<td>c. Product ingredient listing lists whole grain first. For non-mixed dishes such as breads and cereals, whole grains must be the primary ingredient by weight, with the exception of water. When the whole grain content comes from multiple ingredients, the combined whole grain ingredients may be the primary ingredient by weight even though a whole grain is not listed as the first ingredient. For mixed dishes such as pizza and corn dogs, whole grains must be the primary grain ingredient by weight and be the first grain ingredient listed. For foods prepared by school food service, the recipe will guide determination of whether the total weight of whole grain ingredients exceeds the total weight of non-whole grain ingredients.</td>
</tr>
</tbody>
</table>

A ready-to-eat (RTE) breakfast cereal must list a whole grain as the primary ingredient and be fortified to be creditable. If the grain product includes enriched ingredients, or the product itself is enriched, the ingredients or the grain product must meet the FDA’s standards of identity for enrichment (21 CFR Section 137). Bran and germ are not creditable in school meal programs.
The new NSLP and SBP regulations establish serving size for whole grain-rich grain products based on oz eq rather than bread or bread alternate, and with 16 grams of grains per serving (Table 4). As this differs from the previous standard of 14.75 grams of grains and may require retooling and relabeling on the part of manufacturers, the USDA is allowing SFAs and school food program operators to use the 14.75 gram benchmark through SY 2012-2013. The requirement for whole grain-rich foods can be met by multiple food items each contributing a fraction of an oz eq, and one-quarter of an oz eq is the smallest amount allowable for credit. Breaded and battered products must be counted toward the maximum grain requirement beginning in SY 2013-2014. The USDA has established the equivalent minimum weights for a wide variety of purchased food items to meet the oz eq criteria.7

Table 4. Grain product servings

<table>
<thead>
<tr>
<th>Baked goods (breads, bagels, biscuits)</th>
<th>1 oz eq requires 16 grams of creditable grain ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals and grain products (oatmeal, brown rice, pasta)</td>
<td>1 oz eq equals 28 grams, or 1/2 cup cooked</td>
</tr>
<tr>
<td>Ready-to-eat (RTE) breakfast cereal</td>
<td>1 oz eq equals 28 grams, or 1 cup flakes or rounds, 1 1/4 cups puffed, or 1/4 cup granola</td>
</tr>
</tbody>
</table>

**Current state of whole grain consumption in schools**

Schools increased whole grain servings well in advance of the new school meals legislation. The School Nutrition Association 2010 Back to School Trends Survey found that over 90% of districts across all geographic regions planned to add more whole grain products to their menus.9 Common whole grain breakfast items at that time included cereals, rolls, toaster pastries, and pancakes, while lunch items ranged from breads and rolls to whole grain pizza crust, whole grain pasta, brown rice, and whole grain cereals. In a 2011 School Nutrition Association survey of 1,294 foodservice directors10, 97% reported serving whole grain foods.

Whole grain foods are important to students for their place in a healthful diet and potential health benefits. They have been linked to reduced risk of several chronic diseases11, including weight gain and obesity,12 cardiovascular disease,13 and type 2 diabetes14,15. It is postulated that their health benefits result from the presence of all parts of the grain and the synergies of their potentially bioactive components – dietary fiber, folate, antioxidants, vitamins E and B6, the minerals potassium and magnesium, and the phytochemicals phytic acid and phenolic acids.

The success of whole grains has resulted in good measure from the efforts of foodservice directors to introduce and promote whole grain foods in their schools. However, continued success will require coordinated efforts by all members of the
supply chain, and, in particular, growers, manufacturers, distributors, and foodservice personnel.

**Focus on the supply chain – Growers**
At the top of the school whole grain supply chain are wheat growers. Wheat is the third largest crop in the United States after corn and soybeans. Since 1990, the planted acreage of wheat in the United States has decreased by about one-third while acreage for both corn and soybeans has increased. However, total wheat yields continually increase due to superior genetics and production practices, so while acreage has been reduced, the yield per acre has gone up. Another positive development for growers has been the increasing use of white whole wheat flour in whole grain products, with resultant increases in production, sales, and domestic use for the general market, as well as for schools.

Hard white wheat is a strain of wheat that lacks the genes to develop the phenol-rich dark bran of red wheat. As such, it is lighter in color and has a milder flavor than red wheat. Ground white whole wheat flour resembles white flour in appearance but matches whole wheat in nutrition. Compared to traditional whole wheat flour, it offers premium baking performance and a softer texture in the final product. The growing success of whole grain products in schools is due in good measure to the ready acceptance among children of whole wheat products made with white whole wheat flour.

**Opportunities**
Growers respond to market demand. A positive development such as the new school meals regulations should be beneficial to growers as demand increases for products made with white whole wheat flour.

For growers, communications opportunities often are limited to business contact with those who purchase their products domestically. These can include large grain processors such as Cargill who provide marketing, contract, and crop management services.

**Barriers**
Despite widespread acceptance of white whole wheat products, production of hard white wheat has lagged behind the more traditional hard red wheat. The Grain Inspection, Packers and Stockyards Administration (GIPSA) believes that this may be the result of lack of government incentive, lower demand from the export market, special handling requirements for storing and processing white wheat apart from red wheat, and alternative crops with greater profit potential. GIPSA suggests that this could cause shortages that would critically impact manufacturers of products made with white whole wheat flour and therefore affect availability of white whole wheat products in
schools. However, as the market for white whole wheat flour and products made from it increases, growers are likely to respond by planting more acreage of hard white wheat.

Patent protection has arisen regarding the use of white wheat flour. If the production of white whole wheat flour that matches the nutrients of whole wheat while offering the texture, taste, and characteristics of refined flour can be protected by patent and therefore limited in use, the marketplace for growers of hard white wheat may become more limited and restrictive.

**Supply chain communications opportunities for growers**

| With grain companies | • Seek out information on market demand  
|                      |   • Work collaboratively toward improvement of whole grain crop management and yield |
| With manufacturers   | • Explore the value of specific grains  
|                      |   • Inquire regarding which grains work best in their manufacturing processes  
|                      |   • Seek out information on development of new whole wheat-rich products and types of grains required |

**Focus on the supply chain – Manufacturers and industry**

Manufacturers of whole grain products for schools include companies of all sizes, from industry giants such as Kellogg’s and General Mills to small bakers who contract with local school districts. Large companies are highly dedicated to the schools market, with entire sales teams and product development divisions that service schools and foodservice providers.

Many manufacturers worked ahead of the new school meals regulations, addressing ways to use whole grains in existing and new products, cost management for whole grain products, and ingredient technology. Established products such as crackers, cereal bars, cereals, and other grain products were renovated to meet the “whole grain first” ingredient criteria of the new regulations. A major goal of current and future product development is to utilize different grain combinations and varieties to create new whole grain-rich items whose taste and texture will be accepted by students.

**Opportunities**

For large manufacturers, whole grain product development ideas generally originate in-house. However, they are not created in a vacuum. The sales force, marketing team,
school education liaisons, and other company personnel are in constant contact with
school districts to discuss their needs. By the time a new product enters the
development phase, the manufacturer is reasonably assured that the product will be of
value to schools. While large manufacturers generally are unable to develop custom
new products for particular school districts, they may be able to change packaging for
larger districts, for example, switching from a single-serve box to a bowl.

Food manufacturers communicate with districts about products both directly and
through foodservice distributors and providers. Each year, manufacturers present and
discuss their product line for the coming school year with school food personnel. Bid
specifications may be due as early as December for the following school year and some
districts complete their ordering of commodities and development of menus by April.
Both product orders and feedback help guide the development of new products to meet
school district needs.

Manufacturers also can stay connected with school district needs through trade
associations. The School Nutrition Association offers membership and sponsorship
options that help companies both stay apprised of issues and trends surrounding the
provision of foods in schools and network with members who also supply products for
school meals. The Alliance for a Healthier Generation, an initiative of the William J.
Clinton Foundation, encourages manufacturers to join its industry group and pledge to
help America’s schools serve healthier meals at affordable prices.

Producers of whole grain-rich products generally are conservative in their approach to
student outreach. While some companies provide teacher and classroom materials,
many communicate their whole grain message via product packaging with the Whole
Grain Stamp, wording indicating that a product is made with whole grains, or
incorporation of whole grain into the product name.

**Barriers**
Manufacturers worry about whole grain supply. They require consistent, quality
ingredients in order to create a quality product. To ensure a steady supply,
manufacturers continuously explore new grain varieties and seek out more efficient
technologies.

Whole grain products cost more to produce than those made with refined flour.
Furthermore, manufacturers must subject any new whole grain ingredient to a costly
quality assurance process to ensure that the grain meets company standards for quality,
safety, and other measures. The switch to whole grain might be easier for smaller
companies who store their flour in sacks rather than silos that require comprehensive
cleaning before being filled with a different type of flour. In order to switch from refined
to whole grain flour, a large manufacturer has to find alternate storage facilities for its
various flours, possibly displacing some types of flour in the process. Not surprisingly, manufacturers pass along some of the related costs to school districts. It is expected, however, that production costs and therefore price will decrease with the increased demand created by the new regulations. However, the new weekly grain maximums, which are lower than previous guidelines, may actually reduce total servings of whole grain-rich products in some schools.

Products will be successful only if they are accepted by students. Whole grain-rich pizza crust, bread, rolls, and pancakes enjoy broad acceptance. Whole grain-rich pasta, however, has not been as popular to date and may require additional research and development efforts to improve its texture and flavor. Communication between manufacturers and SFAs and program operators, who can observe and talk to students, provides valuable feedback that can guide product modifications.

Realistic expectations regarding changes in product formulations also are important. Concern over sugar in the diet has led many school districts to request that manufacturers produce whole grain cereals and other items for schools that are low in sugar or set to a particular sugar gram limit. Not only are these sugar limits arbitrary and not backed by scientific research, but they also are likely to increase plate waste if students do not perceive the resultant products as tasting good.

The change to 16 grams will be burdensome to manufacturers who now must incur additional costs to reformulate products, retool manufacturing processes, and change packaging.

**Supply chain communications opportunities for manufacturers**

| With growers                           | • Collaborate with growers on crop management services to help control quality, yield, and cost  
|                                        | • Support research and field tests to develop new whole grain varieties  |
| With brokers                          | • Regularly apprise of new whole grain products  
|                                        | • Inquire about desired product specifications for the schools market  
|                                        | • Solicit information on anticipated demand at the school level  |
| With school districts and distributors | • Communicate regularly regarding product acceptance and whole grain product needs  
|                                        | • Work together to create new menu items  |
Focus on the supply chain – Foodservice brokers and distributors

Foodservice brokers and distributors are important “middlemen” in the whole grain supply chain, serving as an information conduit between school meals providers and food manufacturers. The two have different functions: Brokers work directly for and with manufacturers, representing their products to distributors and schools. Distributors serve as the go-to resource for schools by procuring the food products, including whole grains, specified by districts.

Many brokers and distributors, in conjunction with food manufacturers, acted in response to the IOM report and in advance of the school meals regulations to encourage increased availability of whole grain-rich products such as cereals, breads and rolls, pizza dough, pasta, and breakfast items. They continue to play a critical role in promoting whole grain-rich foods to schools.

Opportunities

A major role of brokers is to communicate with both manufacturers and schools to ensure that school foodservice departments get the whole grain-rich products they desire. This presents an opportunity for brokers to interact with food manufacturer K-12 schools specialists to learn about new whole grain products originating from the manufacturer, as well as provide feedback on the types of whole grain-rich products desired by schools. Brokers also help establish product standards that are consistent with school specifications for the bidding process. This requires robust interaction among brokers, distributors, and SFAs to determine precisely what schools need. Throughout the bid process, brokers can help ensure adequate supply by communicating school demand to manufacturers so that they build appropriate inventories and to distributors so that they have the resources to honor all their bids.

Brokers are in a unique position to fully understand the new definitions for whole grain-rich foods and then educate their customers, namely SFAs, on the whole grain equivalency of one serving of their products. Clear and concise information will allow SFAs to identify those products that meet menu needs. Also, they must supply their
customers with nutrition information and ingredient statements for the products they sell.

Distributors also enjoy close and long-standing relationships with food manufacturers but are a neutral player rather than a representative of manufacturers. Distributors are able to partner with manufacturers who produce specialty whole grain-rich products for school districts. To streamline the bidding process, distributors can utilize technology to standardize food procurement bidding in terms of product specifications, creation of bids, review of responses to bids, and decision-making.

**Barriers**
Brokers and distributors need products that meet school food requirements. As such, they may be the ones to communicate with manufacturers when existing products do not meet nutrition specifications. The new school meals guidelines, in addition to their whole grain requirement, have established a minimum and maximum number of whole grain-rich servings per week. Certain food items, such as pizza, now may exceed the daily total for bread servings. Small bakers in particular may require assistance from distributors in order to better understand such product requirements.

The bidding process presents a major communications barrier, in that brokers and distributors often do not receive follow-up information directly from foodservice directors or district websites on winning bids. Foodservice directors generally lack the time to communicate with each prospective vendor regarding the winning bid for each line item. This requires that brokers and distributors reach out to each district at the conclusion of the bid process, survey winning bids, and calculate needs for the coming school year. Brokers and distributors need to be proactive in pursuing bid results in order to prevent first learning that they have won a bid in the summer, when they receive orders for the coming school year. This can create a logjam for manufacturers who had not been able to estimate needs, strain the distributor’s inventory, and increase costs to schools at a time when cost containment is a top priority.

At the end of the day, a whole grain-rich product needs to be of consistent quality, available in the necessary amounts, and, most importantly, accepted by foodservice directors and staff, as well as students. From their position in the middle of the whole grain supply chain, brokers and distributors can ensure that information is transmitted between those supplying and those demanding.

**Supply chain communications opportunities for brokers and distributors**

| With manufacturers | • Work together to manage supply and demand  
|                    | • Communicate product acceptance  
<p>|                    | • Dialogue regarding regulations and |</p>
<table>
<thead>
<tr>
<th>With school districts</th>
<th>product specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Educate on new products and product lines</td>
</tr>
<tr>
<td></td>
<td>• Gather feedback for food companies on product acceptance</td>
</tr>
<tr>
<td></td>
<td>• Develop standards and specifications for whole grain products</td>
</tr>
<tr>
<td></td>
<td>• Help establish and improve efficiency of the bidding process</td>
</tr>
<tr>
<td></td>
<td>• Explore methods for bid acceptance notifications</td>
</tr>
</tbody>
</table>

**Focus on the Supply Chain – Foodservice directors and management companies**

FSAs, including school foodservice directors and management companies, hold the key to the successful provision of whole grain-rich products in schools. Many promoted whole grain foods long before they were required and have advocated up the supply chain for expanded menu options. The good news is that their strong interest in whole grains, along with the government requirement to serve whole grain-rich products in schools, has resulted in a growing number of foods to choose from.

**Opportunities**

School foodservice directors and managers evaluate a hierarchy of considerations when selecting whole grain-rich foods. These include student acceptance, product availability and cost, local and state standards that fall outside the basic school meals requirements, and staff involvement.

The long build-up toward the new school meals regulations has allowed foodservice directors to gradually bring whole grain-rich foods into the menu. This type of slow introduction can be more successful than a dramatic change in menu items when encouraging children to try and eat new foods, particularly those that they may not be eating at home. In the case of whole grains, children need time to adjust to the stronger flavor, often coarser texture, and darker color of whole grain-rich foods. Feedback from school districts suggests that many whole grain-rich products – pizza, bread, rolls, crackers, breakfast items – are widely accepted. These often contain white whole wheat flour, a product that introduces students to whole grains that have less prominent flavor and color notes. Additionally, grain-based entrées provide a natural setting for the inclusion of not only whole grains but also healthful components such as fruits and vegetables.

Foodservice directors have an opportunity to engage school food personnel and classroom teachers to help market whole grain foods to students. School foodservice staff members can be enthusiastic advocates for whole grains, thinking of creative ways
to enhance menus by incorporating more whole grain-rich dishes, sharing and testing new recipes among themselves and with students, and learning different cooking techniques for whole grain-rich foods. Students may be more willing to try new grain dishes and products when they are introduced to them through taste tests, special whole grain events, new product featured on the menu, signage in the cafeteria, and integration with classroom lessons. Foodservice management companies also offer programs and materials to increase student participation through promotional and education materials and programs for the cafeteria and classroom.

Whole grain-rich options are increasingly more available to schools. Schools can order various products such as brown rice, rolled oats, whole wheat flour, and whole grain pastas through the USDA Commodity Food Program. The USDA makes available an updated list of available whole grain items at www.fns.usda.gov/fdd/programs/schcnp/. Additionally, schools can create demand up the supply chain by writing bid specifications for whole grain-rich products that students are likely to accept and that fall within the cost limitations of school meals budget. Manufacturers have been responding to the needs of the schools market and will continue to innovate for the new whole grain-rich environment.

In an effort to encourage schools to create healthier environments, the USDA established the HealthierUS School Challenge (HUSSC), a voluntary certification initiative established in 2004 to recognize those schools that participate in the National School Lunch Program, now the National School Lunch Program and School Breakfast Program, and exceed federal requirements for school meals. In February 2010, First Lady Michelle Obama introduced Let’s Move! and incorporated the HealthierUS School Challenge into her campaign as a way to help raise a healthier generation of kids. Monetary incentive awards are available for each HUSSC award level: Bronze, Silver, Gold, and Gold Award of Distinction. New award criteria effective July 1, 2012, reflect the recent changes to NSLP and SBP meal pattern requirements. In order to be recognized by HUSSC, schools must participate in SBP and/or NSLP, meet the Average Daily Participation criteria, satisfy the basic criteria for fruits, vegetables, and milk, and meet the HUSSC whole grain criteria – serving whole grain-rich foods 50 to 100 percent of the time, offering a variety of whole grain-rich foods over the course of the week, and matching the portion size of one grain food serving, that is, 1 oz eq. The USDA offers guidance to schools to help them adapt their bidding process for whole grain-rich foods (Table 4).

Table 4. Guidelines for soliciting bids for whole grain-rich products

<table>
<thead>
<tr>
<th>For products with whole grain as the first ingredient on the label, that is, the weight of whole grain is greater than any other ingredient:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ask that food product labels and ingredient statements be submitted with the vendor’s bid on whole-grain products.</td>
</tr>
</tbody>
</table>


• If the first ingredient is not a whole grain but the product has multiple whole grains in the ingredient list, request documentation from the manufacturer as to the weight of the first ingredient and the total weight of all of the whole grain ingredients. The total weight of the whole grain ingredients must be greater than the weight of the first ingredient.

For products with whole grain as the primary grain ingredient by weight, that is, the weight of the whole grain is greater than the weight of any refined grain ingredient:
• Specify that a whole grain be the first grain ingredient of the product.
• Ask that food product labels and ingredient statements be submitted with the vendor’s bid on whole grain products.
• If the first grain ingredient is not a whole grain but there are multiple whole grain ingredients in the product, require the manufacturer to complete a product formulation statement documenting the weight of the first (refined) grain ingredient and the total weight of the whole grains. The total weight of the whole grain ingredients must be greater than the weight of the first grain ingredient.
• If the manufacturer uses flour blends of whole grain and enriched flours, the manufacturer must provide documentation to show that the primary grains in the product are whole grains.

Barriers
In creating new school meals guidelines, the government removed an important barrier to whole grain-rich products in schools, availability. However, although a growing number of products are available, whole grain confusion has been and continues to be problematic. The current definition of whole grain-rich is difficult to use and forces school foodservice directors to rely on manufacturers to translate that definition into products that meet whole grain-rich standards. Foodservice directors also need practical methods for evaluating recipes and products to determine whether they meet the criteria for whole grain-rich.

The introduction of any new menu item can lead to an increase in plate waste. To convert rejection to acceptance, new whole grain-rich products and dishes have to be somewhat familiar to students, taste good, and be enjoyed visibly by other students – peer pressure matters in the cafeteria. Foodservice staff can make the difference by encouraging trial through sampling and promotions. However, manufacturers, distributors, and parents may need to assist with the scheduling and coordination of taste testing as SFAs may have limited staff resources. Schools are highly concerned about plate waste but may be pleasantly surprised to see that students will readily accept many whole grain-rich foods if marketed properly.
Limited funding and cost of food have been cited as pressing issues for school nutrition programs\textsuperscript{10}. The process of containing food costs requires a well-developed menu, defined bidding and procurement process, sound inventory management, employee training, production, and, ultimately, sales to students. The USDA anticipates that incorporating whole grain-rich foods, along with increasing vegetables and fruits as required by the new regulations, will raise food costs 2.5 cents per lunch for the 2012-13 school year and 5 cents per lunch in two years when all grains must be whole grain-rich. Breakfast costs at that time are expected to rise by 14 cents. However, since the new rule requires fewer total grain servings per week, the increased cost of whole grain-rich products may be balanced out by the reduction in number of daily and weekly servings. Smaller school districts, that often pay higher prices than larger districts because they do not enjoy the same bargaining power, may benefit from joining a purchasing group that can procure whole grain products at a more favorable price.

Districts vary in their cooking facilities, with some having full food production facilities and others only being able to thaw and reheat foods. This means that available whole grain-rich options must range from dishes cooked from scratch to those that are heat-and-serve. Such differences make collaborative relationships between schools and distributors, brokers, and/or manufacturers a necessity to ensure that each district has access to a broad enough selection of products.

Foodservice directors face challenges when food trends generate pressure from parents to create dishes and menus that meet the specific needs of students or desires of parents for specialty items such as organic, made with less common varieties of whole grain such as quinoa, or gluten-free. These products typically are more expensive and may appeal to only a few students.

**Supply chain communications opportunities for foodservice directors**

| With manufacturers | • Suggest new products and product line extensions that would be accepted by students  
|                    | • Provide feedback on new items  
|                    | • Brainstorm packaging options  
|                    | • Seek out available educational materials for staff and students |
| With distributors and brokers | • Review available items on a regular basis  
|                               | • Communicate unmet needs for menu items  
|                               | • Ask for recommendations of food items that are well-received in other districts |
Supply chain success stories
The following two cases exemplify the positive results that are possible when members of the whole grain supply chain work together to enhance school foods.

For more than 10 years, District 279 Osseo Area Schools tried to add and increase the amount of whole grain in the breads baked from scratch in district kitchens. Success was limited – different staff members, ovens, mixers, and equipment yielded different results. Each school had to adjust its recipes and procedures, yet no school was able to create products that students would eat. Tom Pellegrino, RD, MS, the school foodservice director and a registered dietitian, continued to reach out to numerous sources for solutions but came up empty. In early 2011, Tom and his team contacted the Future of Grains in Schools Task Force, which put them in touch with Jessica Wellnitz, a senior food technologist in the Cargill Bakery Category. Pellegrino admits to being apprehensive and skeptical regarding Cargill’s interest in and skills to solve Osseo’s problem. Within a few months, however, Wellnitz created recipes using white whole wheat flour that met with staff approval, were easy to follow, and yielded similar results in each of the district’s kitchens. Students and teachers enthusiastically embraced the new bread items on the menu. Whole grain cookie recipes are the next to be developed through this partnership.

When foodservice director and registered dietitian Susan Richardson, RD, LD, MBA, introduced whole grains into the Roseville Area School District 10 years ago, she met with resistance from teachers and parents. Many students in the district were unfamiliar with whole wheat and whole grain products because they did not eat them at home, and therefore rejected them at school. Richardson decided to take a gradual approach, instructing her staff first to serve toasted cheese sandwiches with white bread on the top and whole wheat on the bottom. After a period of time, her staff switched to entirely whole wheat sandwiches, and students ate those also. She has been serving brown rice for years without much complaint from students. More recently, breads and other products made with white whole wheat flour have been readily accepted.
Richardson strongly believes that communicating to suppliers her specifications for whole grain-rich products that also meet desired and required fat and sodium guidelines has resulted in a greater number of options for her districts.

**Call to action – next steps**

Environment plays a significant role in supporting healthy decision-making. Therefore, having diverse whole grain-rich food options on school meals menus makes the healthy choice an easier one for students to embrace and bring home to their families. The practical process of moving whole grain-rich foods into schools must simultaneously integrate whole grains into the supply and distribution chain and address the many underlying environmental factors that may deter or prevent youth and their families from benefitting from healthier food options.

The procurement cycle starts and ends with the school district. It is incumbent upon foodservice directors to plan menus, accurately forecast food, equipment, and labor needs, communicate with supply chain partners, and manage the bidding process. Analysis of current spending while considering options for savings and efficiencies is critical in establishing specific strategies that will allow FSAs to reduce costs and create efficiencies. However, partnerships among food service directors, government, growers, manufacturers, brokers, distributors, school districts, the entire school community, and beyond are needed to make change happen in the food world and improve the nutrition well-being of our society.

School foodservice personnel will succeed as they gain support prior to engaging in projects for whole grain supply chain management initiatives and to select supply chain partners to whom they are fully committed and can trust.

Mindy Hermann, MBA, RD, is a nutrition communications consultant in Mount Kisco, NY.

---