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# Worksite Wellness for UMaine Dining Employees: Healthful Eating for the Holidays

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WORKSITE WELLNESS FOR UMAINE DINING EMPLOYEES:  
HEALTHFUL EATING FOR THE HOLIDAYS

by

Marissa E. Rublee

A Thesis Submitted in Partial Fulfillment  
of the Requirements for a Degree with Honors  
(Food Science and Human Nutrition)

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## Abstract

The objective of this study was to identify change in knowledge and intent to change behavior among University of Maine dining services employees (n=5 females) attending a three-session nutrition education program. The study was a one-group design with a pre- post- assessment. Participants were recruited through flyers distributed at their worksite. The intervention consisted of three one-hour nutrition education sessions implemented outside work hours one day per week over three weeks. Sessions were designed to address healthful holiday cooking and eating, with a focus on 100% whole grains. At pre-assessment, based on a five-point scale from 1= “not likely at all” to 5= “very likely,” the mean score for the 10-item questionnaire (possible range 10-50) was  $31 \pm 5.2$ , indicating the participants were “neutral” on their knowledge and intent to change behavior regarding whole grains around the holidays. At post-assessment, the mean score was  $43.2 \pm 2.2$ , indicating the participants were “somewhat likely” that their knowledge had changed and that they intended to change behavior. Frequencies and percents by response categories for knowledge of whole grains and intent to change behavior were computed at both pre- and post- assessment. At pre-assessment, distribution was spread among the response categories; however, at post-assessment, the distribution was at the higher end of the response category scale. Statistical tests were not reliable due to the small sample size; however, there were positive trends. The intervention could be an effective worksite wellness program for dining services employees to effect health-promoting behavior change during holiday cooking and eating.

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## Introduction

Most Americans consume adequate amounts of grains; however, the overall consumption of whole grains in the United States is far below the recommendation.<sup>1-3</sup> The “Healthy People 2010” was the first “Healthy People” report to outline an objective specific to whole grains, which was to increase the portion of the population of those two years and older who consume at least six servings of grains per day with three of those servings being whole grains.<sup>3-5</sup> In “Healthy People 2020,” under “Nutrition and Weight Status,” the whole grain objective became to “increase the contribution of whole grains to the diets of the population aged 2 years and older” from a 0.3 ounce equivalent per 1,000 calories to 0.6 ounce equivalent per 1,000 calories.<sup>6</sup>

Some confusion resides in both the scientific community and consumer population regarding what constitutes “whole grain” and how to identify processed whole grains on ingredients food lists.<sup>7</sup> The American Association of Cereal Chemists International (ACCI)<sup>11</sup> has developed the most commonly used definition of “whole grain” using specific criteria:

Whole grains shall 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.<sup>7,11</sup>

In an attempt to clarify consumer confusion, in the 2006 guidelines from the Food and Drug Administration, manufacturers were allowed to make factual statements regarding whole grains on the labels of their products, such as “100% whole grain” or “10 grams of whole grains.”<sup>7</sup>

Researchers have found that 40% of the United States population do not consume whole grains and the average consumption is only one serving per day.<sup>2</sup> Based on results from the National Health and Nutrition Examination Surveys (NHANES), the majority of Americans did not meet the 2005 Dietary Guidelines for whole grain consumption in 1991-2002<sup>7</sup> and per ounce equivalents of whole grains for both males and females were below refined grain intake in 2009-2010.<sup>8</sup> Mean whole grain intake (measured in one ounce equivalents) for males aged 50-59 was  $1.00 \pm 0.17$  compared to a refined grain intake of  $6.13 \pm 0.35$ , and for women aged 50-59, the mean whole grain intake was  $0.84 \pm 0.7$  compared to a refined grain intake of  $4.46 \pm 0.25$ .<sup>8</sup> Therefore, continued efforts to increase awareness, knowledge, and behavior change through interventions are necessary in the goal of increasing whole grain consumption and consequently improving the nutritional status of Americans.<sup>2,3,9,10</sup>

The majority of the evidence exploring the health benefits of whole grain consumption and disease risk reduction are from observational studies,<sup>12</sup> in which the biologically active compounds in whole grains, like antioxidants and phytochemicals, have been identified as contributing factors to the health benefits.<sup>2,12</sup>

The most common types of whole grains consumed by Americans are wheat, corn, oats, barley, and rice.<sup>12</sup> Over the last 100 years, however, the consumption of refined grains—grains in which the bran and some of the germ have been removed—has become popular.<sup>10</sup> The process of milling has increased due to consumer demand for the taste of refined grains; however, refining alters the ratio of the endosperm, germ, and bran. Processing causes a loss in dietary fiber, vitamins, minerals, and many other healthful compounds.<sup>10</sup> Fiber, a highly valuable component of whole grains, is beneficial

in gastrointestinal function, specifically in the large intestine, and also benefits overall health.<sup>10</sup>

In order to increase whole grain consumption in the United States, continued behavior interventions and focus groups are necessary to increase knowledge.<sup>2</sup> Using information collected from interventions and focus groups, a feasible strategy can be devised to increase whole grain consumption.<sup>2</sup> Additionally, helping the public develop a better understanding of the relationship between whole grain intake and disease prevention, providing affordable whole grain products, and making public whole grain information and research findings to the media are crucial elements to advancing whole grain consumption in the United States.<sup>2</sup>

The objective of this study was to develop, implement, and evaluate a series of nutrition education sessions regarding whole grain consumption around the holidays for University of Maine dining services employees. The intervention was conducted with the goal of increasing knowledge regarding whole grains and with the intent to change behavior toward increasing whole grain consumption. The program was designed as a targeted intervention, based on a pre-assessment of needs and interests, and structured using Adult Learning Theory principles<sup>26,27,32</sup> to provide an appropriate program for the target population.

## Literature Review

### **Whole Grains versus Refined Grains**

A lack of understanding of what constitutes "whole grain" is a contributing factor to the low consumption of whole grains in the American diet.<sup>7</sup> In order for a grain to be considered "whole," it must contain 100% of the original kernel, including all three parts of the seed: the bran, germ, and endosperm.<sup>13</sup> The bran surrounds both the germ and endosperm, protecting the grain from the environment.<sup>10</sup> The germ supplies food for the growing seed and the endosperm contains the embryo of the plant.<sup>10</sup> Approximately 50-75% of the endosperm is starch; however, proteins are often stored in the endosperm.<sup>10</sup> The bran and the germ contain the majority of the healthful benefits, including high concentrations of B vitamins (niacin, riboflavin, thiamin, and pantothenic acid) and minerals (Mg, Na, Ca, P, K, Fe).<sup>10</sup> Basic amino acids, like arginine and lysine, are also higher in whole grain products.<sup>10</sup>

A whole grain becomes a refined grain when it goes through the refining process in which most of the bran and some of the germ is removed.<sup>10</sup> Removing the bran results in a loss of vitamins, minerals, lignans, phytic acids, phenolic compounds, phytoestrogens, and dietary fiber.<sup>10,13</sup> Before being processed into foods, many refined grain products are enriched with ingredients required by law, including fortification with folic acid, thiamin, riboflavin, niacin, and iron.<sup>13</sup> Although refined grain products are consumed more than whole grain products, the most commonly consumed grains in the United States are wheat, oats, rice, maize, and rye.<sup>10</sup>

### *Health Benefits of Whole Grains*

Hippocrates first recognized the benefits of consuming whole grain bread in the 4<sup>th</sup> century BC.<sup>10</sup> With advancing technology and resources, researchers have discovered positive effects of whole grain consumption related to various disease states including diabetes, cardiovascular disease, and some cancers.<sup>10</sup>

Ghattas and colleagues<sup>14</sup> conducted a study to determine the effect of consumption of whole grains, cereals, and legumes on blood glucose levels, serum lipid profiles, C-reactive protein (CRP), antioxidant enzyme activity, and microalbuminuria. Participants with type 2 diabetes (n=84) ranging from 43 to 64 years of age were separated into eight groups and instructed to consume a balanced diet appropriate for the diabetic patient, along with a test food product made with different sources of fiber. For example, one group consumed the food product made with unsweetened boiled whole wheat and another group consumed ready to eat roasted chickpeas. Each supplement was intended to supply a similar amount (in grams) of carbohydrate. Participants served as their own controls and fasting blood samples were taken before consumption and after one week of ingesting the foods. Urine samples taken from three consecutive mornings were obtained for microalbumin testing. Six of the groups exhibited a slight decrease in waist circumference (measured in centimeters). All groups experienced a decrease in both lipid peroxide levels (percent decrease ranged between -0.96 to -31.07) and CRP levels (percent decrease ranged between -5.3 to -55.4), and one group particularly had a substantial decrease in urinary microalbumin post intervention (maximum percent decrease of -52.48). After consuming the different forms of grains, there were no consistent changes in the serum lipid profiles of participants; however, the consumption

of Belila (partial decorticated wheat consumed in boiled form) significantly decreased the plasma concentration of total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), very low-density lipoprotein cholesterol (VLDL-C), and triglyceride levels. Also, post intervention, there were significant differences in both fasting and postprandial glucose concentrations, which researchers theorize may have been attributed to the retention of some vitamins and minerals (like Vitamin E and magnesium) as a result of the lower fiber content of the partially decorticated wheat. Overall, the researchers showed that consuming the different cereals and legumes, which contributed antioxidant and anti-inflammatory activity, benefitted the diabetic patients.

Ye and colleagues<sup>15</sup> conducted a systematic review in order to summarize the association between whole grain intake and cardiovascular disease (CVD). Of the 66 articles identified, 45 were prospective cohort studies and 21 were randomized control studies. Whole grain intake related to CVD was studied in 10 prospective cohort studies. Comparison of consumers who rarely or never consumed whole grains with consumers who ate between 48-80g of whole grains a day revealed that those with a greater whole grain intake had approximately a 21% lower risk for CVD. The association between total dietary fiber and/or cereal fiber intake with CVD risk was studied in 15 of the identified studies by comparing consumers with the lowest fiber intakes to consumers with the highest fiber intakes. A decrease in CVD risk was associated with total dietary fiber intake (Relative Risk [RR]=0.81) and a decrease in CVD was associated with total cereal intake (RR=0.80). Overall, the recommendation for consuming 48g whole grains/day, which may aid in the prevention of vascular disease, was supported by this systematic review.

Chan and colleagues<sup>16</sup> conducted a study to observe grain and cereal intakes in a large population-based case-control study in relation to risk of pancreatic cancer. The study consisted of 532 cases and 1,701 controls with participants ranging from 21-85 years old from one of the six counties in the San Francisco Bay Area, California. A previously validated 131-item questionnaire was used for participants to report their frequency of certain food items one year before cancer diagnosis for the case population and one year before the interview for the control population. The total whole grain product consumption was calculated by combining the reported servings per day of the individual whole grain products. The grain categories studied included whole grains, refined grains, mixed grains, and sweetened refined grains. Based on the results, consuming  $\geq 2$  servings/day versus  $< 1$  serving/day (odds ratio [OR] = 0.60) resulted in a decrease in pancreatic cancer risk. Individual trends were observed for specific food items, and researchers identified that tortillas and brown rice had the strongest correlation for reduced risk. Both crude and dietary fiber consumption was associated with a 30-35% decrease in pancreatic cancer risk. There was no association found between total refined grains (OR=0.80) and individual grain products in respect to pancreatic cancer risk.

Larsson and colleagues<sup>17</sup> looked at the association between whole grain consumption and colorectal cancer in women of the Swedish Mammography Cohort (n=61,433). Dietary information was collected from a 67-item food frequency questionnaire related to average consumption of each identified food over six months. Whole grain foods included hard whole grain rye bread, soft whole grain bread, cold breakfast cereals, and porridge. Refined grain foods included soft white bread, pasta,



rice, pancakes or waffles, and biscuits or sweet buns. Participants were grouped into quintiles based on their cereal and fiber intake and based on their frequency of whole grain intake. At the beginning of the study, the average daily whole grain consumption was 2.6 servings. Those who consumed more whole grains were older, leaner, more likely to have had postsecondary education, consumed more fruits and vegetables, and had lower intakes of saturated fat. After a 14.8 year follow-up, there were 547 colon cancer cases, 252 rectal cancer cases, and six cases of both colon and rectal cancer. Women who consumed at least 4.5 servings of whole grains a day had a lower risk of colon cancer compared to those who consumed <1.5 servings/day (RR=0.67). Based on an analysis that excluded the cases detected in the first two years of follow-up, there was a 35% lower risk of colon cancer in those with a greater intake of whole grains compared to those with a lower intake. The association for lower risk was found in both proximal colon (RR=0.69) and distal colon (RR=0.54) cancer cases in relation to a high whole grain intake. A 25% reduced risk was found after examining the relationship between cereal fiber intake and risk of colon cancer. The researchers suggested that the observed reduction of colon cancer risk in women might be partially due to the cereal fiber in the whole grains. In all, the researchers found that increasing whole grain consumption, specifically whole grain rye bread, reduced the risk of colon cancer.

### **2010 Dietary Guidelines for Americans**

According to the 2010 Dietary Guidelines, most Americans consume enough total grains; however, the majority of the grains consumed are refined grains.<sup>18</sup> At least half of the total grain intake (48g/day) should be whole grains and refined grain products should be replaced with whole grain foods, rather than simply added, in order to maintain

healthful calorie limits. Americans can reach the recommendation for whole grain intake by consuming three ounces of 100% whole grain bread (one slice = one ounce equivalent) and three ounces of refined-grain bread, or by consuming six ounces of partly whole grain products ( $\geq 51\%$  of total weight whole grain).<sup>18</sup> Many grain products contain both whole grains and refined grains; however, at least 51% of the total weight of the product must be whole grain ingredients in order to be considered a “substantial amount of whole grains.”<sup>18</sup> Whole grain products may display the “Basic Stamp” indicating that the product has at least 8 g/serving of whole grains.<sup>19</sup> Other products may display the “100% Stamp,” indicating that all of the grain ingredients (16 g/serving) are whole grains.<sup>19</sup> Also, having whole grains listed as the first ingredient on the food label is a way to recognize that the ingredient is the most prominent by weight in the food product. By consuming at least three one-ounce equivalents of whole grains per day, risk for several chronic diseases is reduced.<sup>13</sup>

The report, compiled by the 2015 Dietary Guidelines Advisory Committee (DGAC), was recently released<sup>20</sup> and will be used as the basis for 2015 Dietary Guidelines of Americans. According to the 2015 report, the diet quality of the United States population still does not meet the recommendations for whole grains. As supported by the evidence reviewed, the 2015 DGAC connected a healthy dietary pattern with higher whole grain intakes and lower refined grain intakes.

## **Whole Grain Consumption**

### *National Whole Grain Intake*

Since Americans consume only 15% of the goal for whole grain intake, researchers have been interested in studying how to increase the consumption of whole grains.<sup>18</sup> In a survey conducted by the Academy of Nutrition and Dietetics researchers, consumption of whole grains over the last five years remained the same for 45% and decreased for 7% of those surveyed. Although 71% of those who completed the survey believed that they consumed enough whole grains, nine out of ten did not meet the recommendation for whole grains.<sup>21</sup>

Cleveland and colleagues<sup>9</sup> collected data from the 1994-96 USDA's Continuing Survey of Food Intakes by Individuals in order to provide national estimates of whole grain intake in the United States. The researchers identified major sources of whole grains and compared food and nutrient intakes of individuals that consumed whole grains versus individuals that did not consume whole grains. To obtain dietary intake information, trained interviewers went to participants' homes and conducted 24-hour multiple-pass recalls on two non-consecutive days. Data was collected from those 20 years and older (n=9,323). Based on proportion, by weight, of the whole grain ingredients in each food, both whole grain and non-whole grain servings were determined. Researchers identified that only 8% of participants consumed at least three whole-grain servings per day, which met the Dietary Guidelines for Americans recommendations. According to the survey, United States adults consumed, on average, 6.7 servings of grain products per day; however, only 1.0 serving was whole grain. Nearly one-third of the whole grain servings reported came from yeast breads and

breakfast cereals and one-fifth consisted of grain-based snacks. Nutrient profiles of whole-grain consumers were significantly better than those of the non-consumers and included greater intakes of vitamins and minerals, and lower intakes of fat, saturated fat, and added sugars.

### **Worksite Wellness Studies**

Most adults spend the majority of their day at work, making it an ideal place to promote health and wellness to employees. Implementation of employee wellness programs has been found to be beneficial to not only the employee's health by preventing, controlling, or reducing disease<sup>22</sup> but also for the employer by reducing healthcare costs, increasing employee productivity, and decreasing sicknesses and the rate of absenteeism.<sup>23</sup> Of employees participating in worksite wellness programs, researchers have identified a 28% decrease in sick leave and absenteeism, a 30% decrease in worker's compensation costs, and a 26% decrease in healthcare costs.<sup>23</sup> Despite the evidence-based research, Robroek and colleagues<sup>24</sup> found that only half of employees participated in worksite wellness programs and the majority of those participants were female.

Person and colleagues<sup>25</sup> researched the barriers to providing worksite wellness, specifically related to an employee wellness program called Wellness Wednesdays: "Eat & Meet About Healthy Living" in Greenville, North Carolina. Employees (n=481; female=304, male=177) over the age of 18 were eligible for the program. Only 50 employees (10.4%) participated in the weekly 30-minute classes over ten weeks focusing on nutrition and health-related topics. A registered dietitian taught the lessons and the evaluation was conducted through five-question quizzes distributed at the end of each

lesson to gauge if and what information was retained from the session. Incentives for participating were “\$5.00 wellness bucks” for each class attended; however, no employee attended every class consistently. Short three to five minute interviews regarding attendance, location, participation, incentives, and suggestions were conducted on randomly selected employees who participated in the program (n=19), who did not participate in the program (n=7), and on the program organizer (n=1). No employee attended more than five of the 10 classes and the average class attendance was 11 people. Average scores on the post lesson questionnaires ranged from 71-100%. The researchers concluded that employee wellness programs are effective in increasing knowledge and skills related to health and nutrition; however, they stated that it is important to address the barriers to participation, such as insufficient incentives, poor location, and time limitations during the intervention-planning period in order to improve employee participation.

### *Adult Learning Theories*

When designing a nutrition intervention, it is valuable to consider the learning styles of the target population. When teaching adults, it is important to recognize that adult roles, responsibilities, and previous experiences affect learning.<sup>26</sup> Learning is constantly occurring in adults and this continuous learning process should be facilitated in educational programs.<sup>26</sup> Connecting the subject material directly to the adult audiences’ experiences, both past and current, promotes learning. Adults are also more likely to maintain consistent attendance at a program if they feel the material will directly help them to reach their personal goals. Hands on learning and discussion facilitate learning, especially when the participants are able to practice and express information

provided in useful, practical ways.<sup>26</sup> Additionally, allowing the learners to share personal experiences and knowledge, by incorporating small group discussions as well as question-answer sessions, encourages participation.

Cross<sup>27</sup> developed the Characteristics of Adults as Learners (CAL) model, which works to involve outstanding factors, such as personal characteristics and situational characteristics, to improve learning outcomes. Personal characteristics to be considered are life phases, developmental stages, and aging whereas situational characteristics involve voluntary versus compulsory learning and part-time versus full-time learning. The purpose of the CAL model is to provide guidelines for adult education programs and it focuses on four main principles:<sup>27</sup>

- 1) Adult learning programs should be directed toward the experience of participant.
- 2) Adult learning programs should adapt to the aging limitations of the participants.
- 3) Adults should be challenged to advance toward higher stages of personal development.
- 4) Adults should have as much choice as possible in the availability and organization of learning programs.<sup>27</sup>

In a systematic review, Eyles and Mhurchu<sup>28</sup> evaluated evidence regarding the effectiveness of long term ( $\geq 6$  months) tailored education for adults. The authors noted that many people have a tendency to ignore generic nutrition education messages because they seem irrelevant to them; therefore, they focused primarily on the effect of tailoring. Both nutrition-related health behaviors, such as dietary intake and food purchases, and anthropometric measures were analyzed. Fifteen studies (n=20,809 participants) were included in the analysis and the median sample size was 674. The majority of participants were volunteers of healthy or mixed-health status, ranging in age from 18 years to  $\geq 85$  years. For the purpose of the study, tailoring was defined as:

Any combination of information or change strategies intended to reach one specific person, based on characteristics that are unique to that person, are related to the outcome of interest, and have been derived from individual assessment.<sup>29</sup>

Generic nutrition was defined as:

Education intended to reach some specific subgroup of the general population usually based on one or more demographic characteristics shared by its members.<sup>29</sup>

The majority of the interventions were tailored with regard to current nutrient intake, diet, or food purchases, as well as by nutrition knowledge, perceived adequacy of nutrient intake, occupation, demographics, dietary preferences, environmental and social support, religion, motivational reasons for wanting to lose weight or make diet changes, former weight loss attempts, and psychosocial factors.<sup>28</sup> In regard to the long-term effects of tailoring on daily servings of fruits and vegetables, based on analysis of four trials (n=4,638) to compare nutrition tailored education with generic nutrition education, a weighted mean difference of 0.35 servings per day more following the tailored intervention was found. In an analysis of six trials (n=12,187) to examine tailored nutrition education with no nutrition education (control), an increase in self-reported daily intakes of fruits and vegetables (0.59 servings per day) was found as a result of tailored education. While self-reported dietary data was used in many studies, it was recommended by the researchers that more objective measures be used in future studies, since false-positive findings may be found with self-reports. Overall, the researchers concluded that tailored nutrition education might be a favorable strategy for improving dietary intake in adults' long term ( $\geq 6$  months).

## **Increasing Whole Grain Consumption**

Increasing whole grain consumption among Americans is a challenge in many respects. For example, when contributing to consumer knowledge and education regarding the importance of whole grain consumption, it is also important to provide educational materials highlighting that foods made with grains can differ widely in the amount of sugar, sodium, calories, and fat, in order to help consumers make health-promoting choices.<sup>19</sup> Additionally, consumer preferences, such as grain price, softness, and texture contribute barriers to overall whole grain consumption.<sup>10</sup>

McKeown and colleagues<sup>19</sup> summarized some of the challenges and opportunities researchers and nutrition educators face in increasing knowledge of whole grains and translating that information to consumers. During the Grains for Health Foundation's 2012 Whole Grains Summit,<sup>19</sup> challenges of grain consumption were discussed.

The objectives of the summit were reported to be to identify, understand, and discuss:

- Challenges and opportunities for filling research gaps relative to dietary guidance worldwide.
- Ways to build effective professional communications across disciplines and continents through engaging dialogue.
- Goals for global dietary guidance and how to identify ways to fill knowledge gaps where the research is not conclusive on whole grains and health.
- Consumer demand and supply chain challenges for increasing consumption of whole grains.
- Opportunities for reformulation or development of new whole grain products.
- Effective approaches to link whole grains research to communication and action.<sup>19</sup>

While there are currently standards for public health communications and policy, health claims, and nutrition labeling regarding whole grain consumption, the standards vary from country to country.<sup>19</sup> The lack of international standards for whole grains adds to the confusion consumers and professionals are faced with when choosing whole grain products. While the Whole Grains Council has developed a whole grain stamp to



indicate that a product contains either 8 or 16g of whole grains, it lacks universal understanding and use by consumers.<sup>19</sup>

Other factors to consider when developing a consumer educational program is that consumers note color, price, and texture as primary reasons for not choosing whole grain products. Helping consumers to substitute whole grain flour for refined flour in minimal amounts to increase whole grain intake could increase consumer acceptance of whole grain products. Overall, to increase whole grain intake in Americans, it will take a cooperative effort from industry, government, academia, non-profit health organizations, and the media in order to promote whole grain understanding.<sup>10</sup> Continued research on the health benefits of whole grains, technological advances to improve palatability, and increased education efforts on the benefits of whole grains is necessary in making a shift toward meeting the recommendation for whole grain consumption.

In summary, based on the review of the literature, nutrition education efforts are pivotal in increasing whole grain consumption in the United States.<sup>9,23,26,28</sup> While nutrition education is only one component of increasing consumption based on the studies reviewed,<sup>9,23,26,28</sup> increasing whole grain consumption improves health outcomes in regard to diabetes, cardiovascular health, and the risk for some cancers in various populations.<sup>14-17,20</sup> Although there have been health claims on food labels since 1990 to both educate and encourage consumers to eat healthful foods, whole grain consumption in the United States is still below the recommendation.<sup>2</sup> With education, adults have been shown to increase whole grain consumption and improve health;<sup>23,26</sup> however, participation in worksite wellness programs tends to be limited.<sup>28</sup>

## Methodology

### **Goal and Objectives**

The goal of this study was to develop, implement, and evaluate a nutrition education program offered after work hours for University of Maine dining services employees. The objectives were to identify change in knowledge and intent to change behavior following a three-session nutrition education class.

### **Study Design**

The design was a one-group intervention study with a pre- post- test assessment. A 10-item questionnaire was designed and tailored specifically for the intervention. The intervention was designed as three, one-hour sessions administered one day a week for three weeks. The study took place in the three weeks prior to Thanksgiving in order to focus on and promote healthy eating around the holidays. Approval to conduct research with human subjects was obtained from the University for Maine Review Board for the Protection of Human Subjects (Appendix A). An informed consent was also drafted and approved (Appendix B).

### **Participants**

Participants were University of Maine dining services employees. The employees worked in one of the five dining or catering facilities on campus. The group was entirely female.

### **Recruitment**

Recruitment started with the distribution of an “Interest Survey” to those who expressed interest in the program (Appendix C). Ten employees completed the survey

and results were used to design and target the sessions to potential participants' interests (Appendix D). Through collaboration with the Dining Services Manager, Jodi Munster, participants were recruited on a voluntary basis. Student staff were excluded from the study. The manager distributed flyers in the various dining locations (Appendix E). Based on those who responded to the flyer and survey, the researcher and manager worked together to plan the education sessions at a time convenient for those interested to maximize consistent participation. Attendance was based on individual motivation and incentives provided at the end of the lessons, including a drawing for a \$25 Hannaford gift card and 20 RiseUP points. The RiseUP points were incentives offered through the University of Maine System wellness program. The gift card was funded through the Charlie Slavin Research Fund and the RiseUp points were offered through the university health improvement manager as part of the university health incentive program.<sup>30</sup>

### **Research Protocol**

Participants met in a multipurpose room in the New Balance Student Recreation Center. The location was convenient to participants. The room was set up to allow for an intimate, comfortable environment with visuals and hands-on materials available (Appendix F). The hour-long lessons were from 2:30pm to 3:30pm. On the first day, following an initial welcome by the researcher, the consent form was reviewed and signed by the participants. The pre- post- assessment questionnaire was administered at the first session and at the end of the third session (Appendix G). At each session, the researcher gave a general overview of the class, encouraging attendance at all three sessions. Each education session included an 8-minute introduction/recap, 15-minute presentation, 12-minute hands-on activity, 10-minute discussion and question/answer

session, and a 5-minute wrap-up (Appendix H). An informal program evaluation was completed at the end of the third session (Appendix I).

## **Instruments**

### *Pre- Post- Questionnaire*

A 10-item questionnaire ( $\alpha = 0.68$ ) was designed to reflect the specific objectives of the nutrition education series. The questionnaire was designed as a Likert scale with response category descriptors ranging from 1= “not likely at all” to 5 = “very likely.” Scores ranged from 10-50. The questionnaire included questions about basic knowledge (n=4 questions) regarding 100% whole grains and about behavior change (n=6 questions) in relation to intent to buy, cook, and set goals around the use of 100% whole grains. The questionnaire was designed to take five minutes to complete. Sample questions include: “How likely are you to be able to identify health benefits of whole grains,” “How likely are you to cook with 100% whole grains,” and “how likely are you to select 100% whole grains when you make and/or eat holiday foods this year?” It was reviewed by the co-advisors, pretested for clarity, and revised accordingly.

## **Intervention**

### *Nutrition Education Lessons*

In preparation for lesson development, the information collected from the “Interest Survey,” completed by 10 employees, was used to design and target the sessions to potential participants’ interests for the “Whole Grains for the Holidays Wellness Program.”

Nutrition education lessons were developed by the researcher using an Adult Centered Education (ACE) lesson plan, which was based on the Adult Learning Theory

and was designed to elicit discussions and involvement of the learner in all aspects of the learning process.<sup>31</sup> Key principles of the Adult Learning Theory<sup>32</sup> include:

- Adults are motivated by internal factors and are self-directed learners.
- Adults have knowledge and life experiences to contribute to various learning experiences.
- Adults are goal oriented.
- Adults learn best when the information is relevant.
- Adults are practical.
- Adults learn best when they are respected.<sup>32</sup>

Lesson plans (Appendix H) were adapted from two existing plans, “WIC Healthy Habits Lesson Plan”<sup>33</sup> and “Eating Smart, Being Active.”<sup>34</sup> Sessions included an activity and taste test. Additional evidence-based resources about holiday eating and whole grains used in developing the sessions were a Harvard Health publication<sup>35</sup> and information from several websites.<sup>13,36-37</sup> An overview of the three lessons is displayed in Table 1.

Table 1. Nutrition Education Lessons Overview: Objectives and Activities

	Objectives	Handouts	Activities
<p>Lesson 1: <i>What Are Whole Grains Anyway? Whole Grains 101</i></p>	<p>By the end of the session, participants will be able to:</p> <ul style="list-style-type: none"> <li>• Identify the difference between whole grains and refined grains.</li> <li>• Identify three health benefits of whole grains.</li> <li>• Use a food label to identify if a product is whole grain.</li> </ul>	<ul style="list-style-type: none"> <li>• “Welcome to Whole Grains” by Whole Grains Council</li> <li>• Informed Consent</li> <li>• 10-item questionnaire</li> <li>• Appetizer tasting worksheet</li> <li>• Cracker Ingredient Labels</li> </ul>	<ul style="list-style-type: none"> <li>• (Optional) Taste test of holiday appetizer on whole grain and refined grain crackers</li> <li>• Compare and contrast two food labels of the two crackers tasted</li> <li>• Determine which is whole grain and which is refined using food labels</li> </ul>
<p>Lesson 2: <i>Substituting Whole Grains Around the Holidays</i></p>	<p>By the end of the session, participants will be able to:</p> <ul style="list-style-type: none"> <li>• Identify one way to modify a holiday recipe to incorporate whole grains.</li> <li>• Identify the amount of water needed and cooking times for two different whole grains.</li> <li>• Identify two ways their family can incorporate whole grains into meals around the holidays.</li> <li>• Identify the amount of fiber in bulgur and varieties of rice.</li> </ul>	<ul style="list-style-type: none"> <li>• Recipe from optional food tasted</li> <li>• “Cooking Whole Grains is Easy” worksheet</li> </ul>	<ul style="list-style-type: none"> <li>• (Optional) Taste test of holiday side-dish with brown rice</li> <li>• Discuss taste and texture with the whole grain ingredient</li> <li>• Share holiday recipes from home and possible modifications</li> </ul>
<p>Lesson 3: <i>Setting Goals to Keep Whole Grains in Holiday Fun</i></p>	<p>By the end of the session, participants will be able to:</p> <ul style="list-style-type: none"> <li>• Identify the difference between soluble and insoluble fiber.</li> <li>• Identify a goal for the holidays regarding 100% whole grain consumption.</li> <li>• Identify a goal for the New Year regarding 100% whole grain consumption.</li> </ul>	<ul style="list-style-type: none"> <li>• Recipe from optional food tasted</li> <li>• “Make Half Your Grains Whole” flier from ChooseMyPlate.gov</li> <li>• 10-item questionnaire</li> </ul>	<ul style="list-style-type: none"> <li>• (Optional) Taste test of holiday dessert with whole grain</li> <li>• Individually, or in pairs, set a short-term and long-term holiday goal using SMART goal setting guidelines</li> </ul>

## **Program Evaluation**

At the end of the three sessions, participants were asked to provide responses to four questions as a means of collecting qualitative data for a program evaluation.

Evaluation questions were: 1) What did you like most about the nutrition education program? 2) What did you like least about the nutrition education program (be specific)? 3) If the program was repeated, what should be added, changed, or left out? and 4)

Overall, how would you rate this program (Excellent, Good, Average, Poor)?

## **Statistical Analysis**

General descriptive statistics were generated. Frequencies and percents were assessed by response categories for knowledge of whole grains and intent to change behavior at pre- and post- assessment. Paired sample *t*-tests were run to compare participant responses from pre- to post- assessment. The significance level was set at  $P \leq 0.05$ . Cronbach's alpha was computed, which is a measure of reliability, specifically internal consistency, used to test how closely related a set of items is as a group. The test is an indication of how accurate the instrument is in assessing the measured constructs (i.e. knowledge and behavior change intent). The acceptable alpha value is  $\geq 0.70$ .<sup>38</sup> A reliability of  $\alpha = 0.68$  was computed for this study and, given the limited sample size, the instrument needs to be tested further. Overall, while statistical tests were conducted, they are not reliable due to the limited sample size. Results should be viewed for practical rather than statistical significance. Dr. Elizabeth Dodge provided statistical support through conducting training in statistical techniques in the Statistical Package for the Social Sciences (SPSS) Professional Versions 21 and 22. She was consulted on interpretation of data.

A post hoc test was run after the intervention to determine the established power of the sample size (0.14) and an a priori test was run for future research to determine the necessary sample size to achieve significance ( $n=54$ ) (Appendix J).



## Results

In this section, the results of the pre- post- assessment of the intervention study on increasing knowledge and intent to change behavior around whole grains are presented.

### **Sample Characteristics**

Of the ten subjects who expressed an interest in the study on the initial “Interest Survey,” five (50%) participated in the study, completing the pre- post- questionnaires and attending each of the three education sessions. While demographic information was not collected, the participants were white, middle-aged females. Interests expressed on the “Interest Survey” included learning how to cook healthy and quick meals, how to eat to maintain good health, how to set goals, how to stay focused on healthful eating around the holidays, and how to make substitutions around the holidays.

### **Pre- and Post- Assessment for Total Sample**

The total 10-item instrument had subscales to assess knowledge (n=4, score range 4-20) and intention to change behavior (n=6; score range 6-30). Based on the two subscales, results by response categories are displayed as frequencies in tabular form in Table 2 and as percents in a pie chart in Figure 1. Of the responses given for whether the participants had knowledge about whole grains at pre-assessment, seven responses were “not very likely,” four were “neutral,” eight were “somewhat likely,” and one was “very likely.” Of the responses about intention to change behavior at pre-assessment, one response was “not likely at all,” ten were “not very likely,” two were “neutral,” twelve were “somewhat likely,” and five were “very likely.”

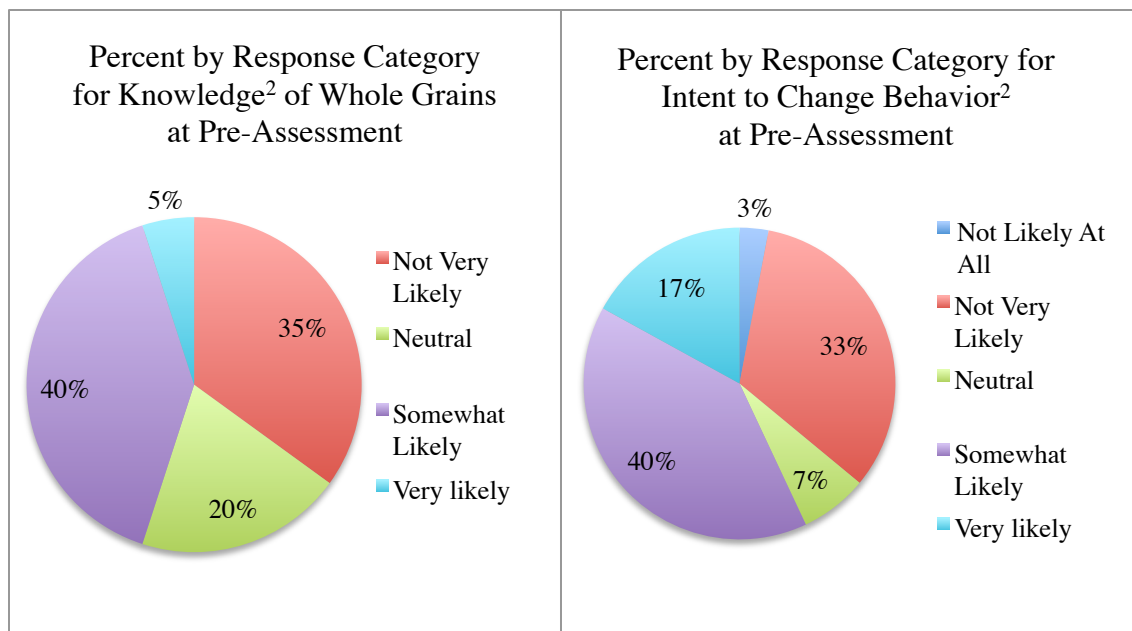
Table 2. Frequency by Response Categories<sup>1</sup> for Knowledge of Whole Grains and Intent to Change Behavior at Pre-Assessment<sup>2</sup>

Subscale	Response Category				
	Not Likely At All	Not Very Likely	Neutral	Somewhat Likely	Very likely
Knowledge of Whole Grains	0	7	4	8	1
Intent to Change Behavior	1	10	2	12	5

<sup>1</sup>n=5 participants

<sup>2</sup>10-item questionnaire: knowledge subscale=4 items, score range=4-20 and behavior change intention subscale=6 items, score range=6-30; score range from “not likely at all” to “very likely” (Appendix G)

Figure 1. Percent by Response Category for Knowledge of Whole Grains and Intent to Change Behavior at Pre-Assessment<sup>1</sup>



<sup>1</sup>n=5 participants

<sup>2</sup>10-item questionnaire: knowledge subscale=4 items, score range=4-20 and behavior change intention subscale=6 items, score range=6-30; score range from “not likely at all” to “very likely” (Appendix G)

At post-assessment, there was a positive shift in the response categories as seen in Table 3 for the frequencies and in Figure 2 for the percents. Of the response categories for participants’ knowledge of whole grains at post-assessment, all were either “somewhat likely” or “very likely” to respond that they knew about such things as the health benefits of whole grains and how to identify if a product was a whole grain.

For intention to change behavior, all were either “somewhat likely” or “very likely” to do such things as cook with 100% whole grains and set goals regarding whole grains around the holidays.

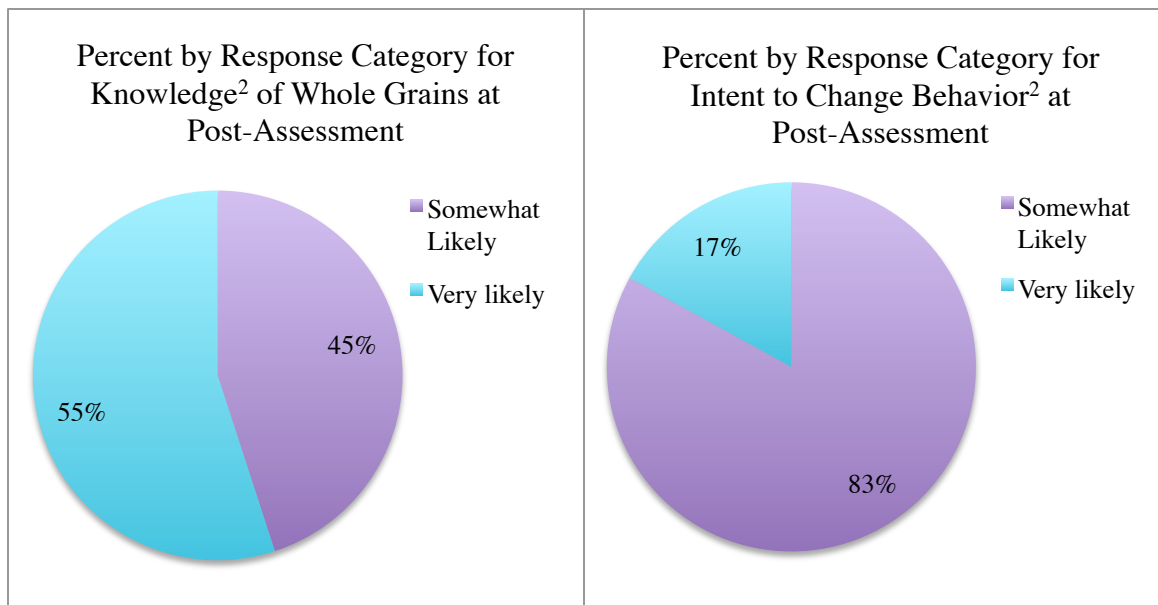
Table 3. Frequency by Response Categories<sup>1</sup> for Knowledge of Whole Grains and Intent to Change Behavior at Post-Assessment<sup>2</sup>

Subscale	Response Category				
	Not Likely At All	Not Very Likely	Neutral	Somewhat Likely	Very likely
Knowledge of Whole Grains	0	0	0	9	11
Intent to Change Behavior	0	0	0	25	5

<sup>1</sup>n=5 participants

<sup>2</sup>10-item questionnaire: knowledge subscale=4 items, score range=4-20 and behavior change intention subscale=6 items, score range=6-30; score range from “not likely at all” to “very likely” (Appendix G)

Figure 2. Percent by Response Category for Knowledge of Whole Grains and Intent to Change Behavior at Post-Assessment<sup>1</sup>



<sup>1</sup>n=5 participants

<sup>2</sup>10-item questionnaire: knowledge subscale=4 items, score range=4-20 and behavior change intention subscale=6 items, score range=6-30; score range from “not likely at all” to “very likely” (Appendix G)

Findings are presented as mean  $\pm$  standard deviation by item in Table 4. Of the five participants, movement was seen in responses from pre- to post- assessment. Based on paired *t*-tests, changes were significant for six of the 10 items; three items were related to increases in knowledge and three items were related to increase in intent to change behavior.

Table 4. Mean $\pm$ Standard Deviation<sup>1</sup> of Participants' (n=5) Reported Knowledge<sup>2</sup> and Intent for Behavior Change<sup>3</sup> Regarding Whole Grains

<b>Question</b>	<b>Pre-Assessment</b>	<b>Post-Assessment</b>	<b><i>P</i> value</b>
How likely would you be able to:	Mean $\pm$ Standard Deviation		
1. Define what “whole grain” means	3.8 $\pm$ 1.1	4.6 $\pm$ 0.5	0.099
2. Identify health benefits of whole grains	2.6 $\pm$ 0.9	4.2 $\pm$ 0.4	0.016*
3. Identify if the product is whole grain by using the food label	3.4 $\pm$ 0.9	5.0 $\pm$ 0.0	0.016*
4. Explain what fiber is	2.8 $\pm$ 0.8	4.4 $\pm$ 0.5	0.003*
5. Make modifications to recipes to incorporate whole grains	2.6 $\pm$ 0.9	4.0 $\pm$ 0.0	0.025*
6. Cook with 100% whole grains	2.6 $\pm$ 0.5	4.2 $\pm$ 0.4	0.003*
7. Buy foods labeled “100% Whole Grain” rather than foods like breads, pastas, and cereals made with white flour	3.4 $\pm$ 1.8	4.2 $\pm$ 0.4	0.338
8. Select 100% whole grains when you make and/or eat holiday foods this year	2.4 $\pm$ 0.9	4.0 $\pm$ 0.0	0.016*
9. Set goals regarding whole grains around the holidays	3.2 $\pm$ 1.3	4.0 $\pm$ 0.0	0.242
10. Increase your whole grain consumption overall	4.2 $\pm$ 0.4	4.6 $\pm$ 0.5	0.178

<sup>1</sup>10-item questionnaire: knowledge subscale=4 items, score range=4-20 and behavior change intention subscale=6 items, score range=6-30; score range from “not likely at all” to “very likely” (Appendix G)

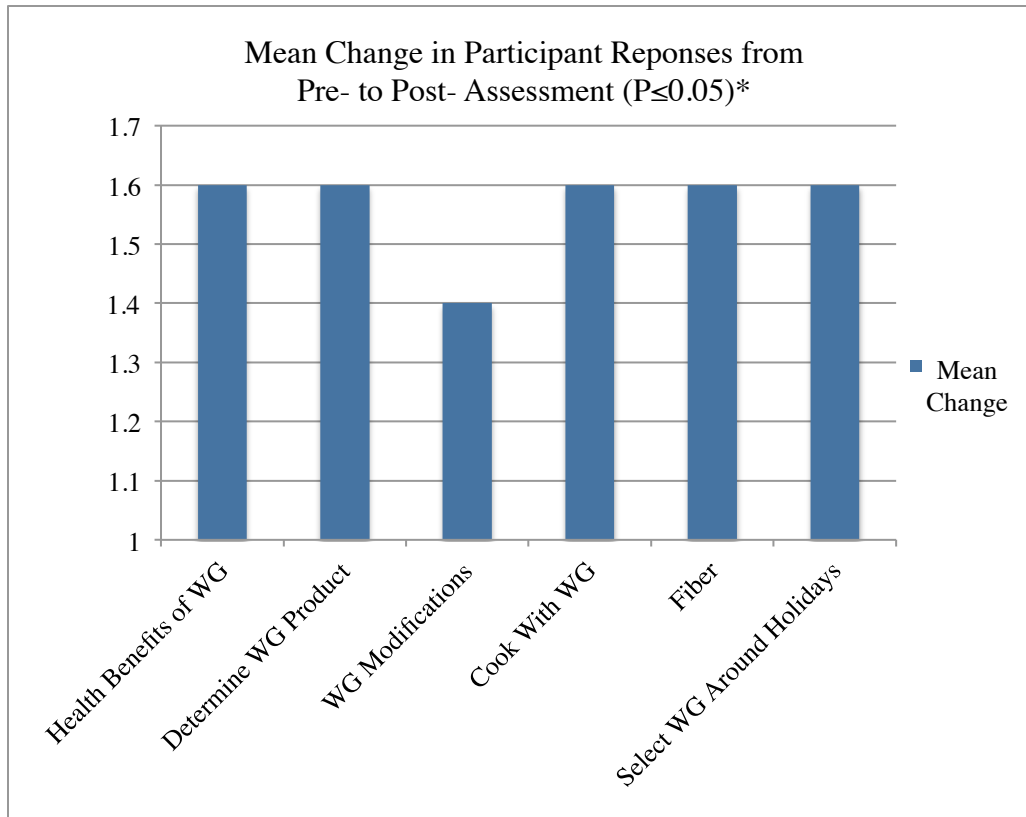
<sup>2</sup> Based on questions 1-4, participants' knowledge regarding whole grains is indicated.

<sup>3</sup> Based on questions 5-10, participant's intent to change behavior regarding whole grains is indicated.

\*Indicates significance based on the paired *t*-test,  $P \leq 0.05$ .

Results are displayed as mean change for those items that changed significantly from pre- to post- assessment in Figure 3. Five out of the six items had a mean change of 1.6 and one item had a mean change of 1.4.

Figure 3. Mean Change in Participant Responses (n=5) from Pre- to Post- Assessment ( $P \leq 0.05$ )\*



\*Change from pre- to post- assessment based on paired *t*-test  $P \leq 0.05$ .

Based on results from the program evaluation, participants listed strengths of the program to be information gained about fiber, how to identify 100% whole grains, how to substitute white flour with whole grain flours, and how to cook with whole grains. Participants also commented on the comfortable learning environment and noted that they enjoyed the informative and interesting information presented. No one listed a least favorite aspect; however, when asked how a future course might be designed, they listed

potentially providing more in-depth information, such as additional tips on cooking with whole grains. Based on the 4-point scales, four rated the program as “4” for “excellent” and one rated it is a “3” for “good.”

## Discussion

The pre- post- assessment intervention study, “Whole Grains for the Holidays Wellness Program,” was designed to provide nutrition education around whole grains, with a focus on the holidays, to a group of University of Maine dining services employees. The study was implemented over three consecutive weeks in November 2014 with the goal of increasing participant knowledge of whole grains and intent to change behavior. Participants, who were middle-aged females (n=5), attended all sessions.

Due to the small sample size, statistical tests were not reliable; however, positive trends were observed in increased knowledge and indication for behavior change. Based on the participant response category distribution (Table 2-3, Figure 1-2), the shift in participant response was observed. At pre-assessment, distribution was spread along the response categories in regard to both knowledge and intent to change behavior; however, at post-assessment, the distribution was at the higher end of the response category scale, with the indication that participants were “somewhat likely” or “very likely” to have increased in knowledge and intended to change behavior related to whole grains. It is worth noting that, at post-assessment, there appeared to be a more equal distribution in the response categories for knowledge increase with 55% of responses for “very likely” and 45% for “somewhat likely” that they, for example, could identify that a product was whole grain by using the food label, compared to 17% for “very likely” and 83% for “somewhat likely” that they intended, for example, to make modifications in recipes to incorporate whole grains. The variance in distribution between knowledge and intent to change behavior may be indicative of a greater difficulty of commitment toward

changing lifestyle behaviors when compared to participants' confidence in their acquired knowledge.

Overall, there was a shift in knowledge and intended behavior change from over the three-week period from being “neutral” (mean score=31±5.2) to “somewhat likely” (mean score=43.2±2.2), indicating that participants knew important whole grain concepts and intended to change behavior around purchasing, cooking, and eating whole grains (score range=10-50).

Positive increases in education and health outcomes occur through community-based nutrition interventions. Such interventions have been proven to provide positive increases in education and health outcomes.<sup>14-17,23,25</sup> Additionally, there is evidence that through worksite wellness programs, employees improve health and consequently productivity by preventing, controlling, or reducing disease.<sup>22</sup> Limited participation in programs, as experienced in this study, is common.<sup>24</sup> Increasing the convenience and participation incentive for nutrition education programs, such as the one conducted, is important in obtaining a larger sample size. Addressing specific populations and focusing education to meet the needs of the given population, such as employees, is a positive step toward increasing whole grain consumption in the United States.

Significant research has been done surrounding the health benefits of whole grains<sup>14-17</sup> and the positive impacts of nutrition education, though continued research is necessary.<sup>9,23,26,28</sup> While there is national data regarding whole grain consumption, this researcher found no specific data regarding whole grain consumption in Maine, or more specifically, at the University of Maine. While the study conducted was directed toward the interests of those participating in relation to whole grain consumption and the



holidays, collecting data about current whole grain dietary intake of University of Maine employees would provide baseline data in order to determine the need for intervention.

Data could be monitored over time to test for program effectiveness.

It is important to note that the data was self-reported and studied from the perspective of immediate change in knowledge and short-term intention to change behavior. By providing a follow-up assessment, evidence of behavior change could be assessed. Further program development and instrument testing with a larger sample size could provide the foundation for a beneficial adult worksite wellness program for university campuses.

There were positive findings, though a small sample size (n=5), which appear to be the result of the intervention. This study was carefully constructed and planned in order to provide the best possible education to the participants. The lessons and instrument were created specific for the current study, allowing for specific topics to be addressed based on participant interests. The intimate setting and learner-focused structure likely contributed to participants feeling comfortable and facilitated a preferred learning environment. Based on participant engagement in the program and positive trends, further worksite wellness programs about nutrition related topics could be beneficial for University of Maine staff with respect to primary prevention of chronic diseases.<sup>23</sup>

### **Limitations**

The primary limitation of this study was the small sample size given the potential pool of University of Maine dining services employees. A possible explanation for limited participation may be that the sessions were conducted outside of the workday.

Also, while incentives were provided, it is possible they were not great enough to stimulate participation. Additionally, the series of lessons occurred in November, a brisk time in Maine, which may have decreased personal motivation to attend an additional class after work.

## Conclusion

The “Whole Grains for the Holidays Wellness Program” was designed to intervene with University of Maine dining services employees by providing an interactive and focused nutrition education program in an effort to improve knowledge on whole grains and intent to increase consumption, with a special focus on the holidays. Participants indicated an increase in knowledge and an intention for behavior change from pre- to post- assessment. At pre-assessment, participants indicated an overall neutral knowledge base and intent to change behavior; however, at post-assessment, knowledge increased and intent to change behavior progressed to overall “somewhat likely.”

In order to increase individual’s consumption of whole grains, nutrition interventions are pivotal. While the results from the study are not statistically significant due to the limited number of participants, the hypothesized positive trends in increased participant knowledge and intent to change behavior regarding whole grains following nutrition education was confirmed through statistical analysis. It is known that whole grains are an essential element in the diet and for health; however, a lack of knowledge of what constitutes as a whole grain, how to cook with whole grains, and how to increase whole grain consumption are areas that need to be emphasized. The potential for behavior change exists through increasing knowledge of whole grains, which may contribute to a greater percentage of Americans who consume at least three servings of whole grains per day.

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Appendices

Appendix A: International Review Board Approval

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APPLICATION FOR APPROVAL OF RESEARCH WITH HUMAN SUBJECTS
Protection of Human Subjects Review Board, 114 Alumni Hall, 581-1498

PRINCIPAL INVESTIGATOR: Marissa Rublee
EMAIL: marissa.rublee@umit.maine.edu TELEPHONE: 207-469-8799
CO-INVESTIGATOR(S): N/A
FACULTY SPONSOR (Required if PI is a student): Adrienne White, Joanna Rosebush
TITLE OF PROJECT: Worksite Wellness for Maine Dining Employees: Healthy Eating for the Holidays
START DATE: October 1st, 2014 PI DEPARTMENT: Student (Dep. of Food and Agriculture)
MAILING ADDRESS: 258B Brunswick St., Old Town, ME 04468
FUNDING AGENCY (if any): -
STATUS OF PI: FACULTY/STAFF/GRADUATE/UNDERGRADUATE

- 1. If PI is a student, is this research to be performed:
for an honors thesis/senior thesis/capstone?
for a doctoral dissertation?
other (specify)
for a master's thesis?
for a course project?
2. Does this application modify a previously approved project? (Y/N) If yes, please give assigned number (if known) of previously approved project:
3. Is an expedited review requested? (Y/N).

SIGNATURES: All procedures performed under the project will be conducted by individuals qualified and legally entitled to do so. No deviation from the approved protocol will be undertaken without prior approval of the IRB.

Faculty Sponsors are responsible for oversight of research conducted by their students. By signing this application page, the Faculty Sponsor ensures that he/she has read the application and that the conduct of such research will be in accordance with the University of Maine's Policies and Procedures for the Protection of Human Subjects of Research.

9/11/14 Date Principal Investigator Marissa Rublee
Faculty Sponsor Adrienne A. White

FOR IRB USE ONLY Application # 2014-09-15 Date received 9/29/14 Review (F/E): E
Expedited Category: IR3g

ACTION TAKEN:
Judged Exempt; category Modifications required? (Y/N) Accepted (date)
Approved as submitted. Date of next review: by Degree of Risk:
Approved pending modifications. Date of next review: by 10/27/15 Degree of Risk: minimal
Modifications accepted (date): 10/30/14
Not approved. (See attached statement.)
Judged not research with human subjects

Date: 10/28/14 Chair's Signature: Cynthia A. Eddy 12/2012



## **Appendix B: Informed Consent**

### **Informed Consent**

Thank you for your interest in a research project being conducted by Marissa Rublee, a fourth-year student in the Honors College at the University of Maine, as a part of her honors thesis. The project will be conducted under co-advisors Dr. Adrienne White, PhD, RD, a professor of Human Nutrition at the University of Maine, and Dr. Joanna Fitchthorn-Rosebush, PhD, RD, LD, Manager of Health Improvement. The purpose of this research is to identify change in knowledge and intent to change behavior.

#### **What will you be asked to do?**

You will be asked to

- Participate in three nutrition education sessions that will be held on Nov 5, Nov 12, and Nov 19 from 2:30-3:30pm.
- Complete a 10-question survey at the first and last nutrition education session that will take approximately 5 minutes to complete.

In the survey, you may be asked for information such as:

By looking at a food label, how likely are you to be able to identify if the product is 100% whole grain?

How likely are you to modify recipes to use 100% whole grains?

#### **Risks**

- Aside from your time and inconvenience, there are no risks to your participation in this study.

#### **Benefits**

Benefits to participation:

- Get fun tips, healthy recipes, and ways to eat healthy around the holiday season!
- Participation and feedback may help the further development of fun, informative, educational opportunities directed toward University of Maine Employees.

#### **Confidentiality**

Data will be confidential; no one but the researchers will see the data. Your name will not be used in publications or presentations about this research and will be removed from all documents and replaced by a code number. A key will be kept linking your name to the code number. The data will be stored separately from identifying information and

will be kept in my advisor's, Dr. Adrienne White, lab. The key and all data will be destroyed in July 2015.

**Voluntary**

Participation in this program is voluntary and will be completed outside of the workday. You may stop participation at any time. During the surveys, you may skip any question or stop answering at any time. Participants will be eligible for a drawing for a \$25 Hannaford gift card at the end of each session and for earning 20 RiseUP points for consistent participation. You must be present at the individual session to be eligible for the \$25 Hannaford gift card. RiseUP points will only be earned for consistent participation in the series of the three weekly sessions.

**Contact Information**

If you have any questions about this study, please contact Marissa Rublee on first class at [marissa.rublee@umit.maine.edu](mailto:marissa.rublee@umit.maine.edu), or contact Adrienne White at 207-581-3134. If you have any questions about your rights as a research participant, please contact Gayle Jones, Assistant to the University of Maine's Protection of Human Subjects Review Board at 207-581-1498 or at [gayle.jones@umit.maine.edu](mailto:gayle.jones@umit.maine.edu).

**Signature**

Your signature below indicates that you have read the above information and agree to participate.

---

Signature

Date

## Appendix C: Interest Survey

Let Us Hear From You!

### Nutrition for the Holidays Interest Survey *for Dining Services Employees*

Starting in November, a series of three “Nutrition for the Holidays” classes will take place. These classes will be open to and directed toward the interest of all those who are dining services employees at the University of Maine, which is why we want to hear from you!

*Please take a moment to fill out this anonymous survey below and return it to your supervisor:*

**1. What area of nutrition are you most interested in?**

(Examples: grains like whole grains and refined grains; foods with fiber; goal setting; grocery shopping; eating for good health; quick healthy meals; cooking for one or two)

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**2. Are you ever confused about what foods have or contain carbohydrates?**

Yes                      No                      Not sure

**3. Do you normally purchase whole grain products?**

Yes                      No                      Not sure

**4. If yes, please circle the products below that you are most likely to purchase:**

Whole Grain Bread      Quinoa              Brown Rice      Whole grain cornmeal

Whole Wheat Crackers      Corn Chips      Oatmeal Popcorn

**5. What is the biggest question you have about eating and/or fixing food around the holidays?**

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**6. Are you interested in participating in a series of three nutrition education sessions in November focused on eating around the holidays?**

Yes                      No                      Maybe

*(If yes, please email Marissa Rublee at [marissa.rublee@umit.maine.edu](mailto:marissa.rublee@umit.maine.edu) indicating your interest ASAP)*

Marissa Rublee, *Human Nutrition Student*  
Adrienne A. White, *School of Food and Agriculture*  
Joanna Rosebush, *Manager of Health Improvement*

**Appendix D: Interest Survey Responses (n=10)**

1. What area of nutrition are you most interested in?

*\*The number in parenthesis indicates the number of common answers written.*

- Cooking healthy and fast for two
- Eating for good health (3)
- Quick healthy meals (3)
- Cooking for one or two (2)
- Goal setting (2)
- Eating for good health (2)
- Foods with fiber
- Everything
- Everything healthy

2. Are you ever confused about what foods have or contain carbohydrates?

Yes (6) No (2) Not Sure (2)

3. Do you normally purchase whole grain products?

Yes (5) No (4) Not Sure (1)

4. If yes, please circle the products below that you are most likely to purchase:

Whole Grain Bread	Quinoa	Brown Rice	Whole Grain Cornmeal	Whole Wheat Crackers	Corn Chips	Oatmeal	Popcorn
7	0	5	0	3	1	3	2

5. What is the biggest question you have about eating and/or fixing food around the holidays?

- Planning not to eat too much
- How to cook with whole foods to provide choices for entertaining
- What holiday foods are not good for you
- How to make a variety of healthy and good tasting foods for everyone
- Fiber
- What foods/snacks convert to energy
- Trying to limit sweets but still have good tasting "snacks"
- How to stay focused on eating healthy and how to make substitution

6. Are you interested in participating in a series of three nutrition education sessions in November focused on eating around the holidays?

Yes (7) No (0) Maybe (3)

## Appendix E: Recruitment Flyer

Who said eating healthy around the holidays was  
impossible?

**Not anymore!**



Marissa Rublee, will be conducting her undergraduate honor's research project about eating well around the holidays. She will offer a 3-session program on **November 5<sup>th</sup>, 12<sup>th</sup>, and 19<sup>th</sup>** from 2:30pm-3:30pm in the ***Multipurpose Room at the Rec Center!***

To participate you must be:

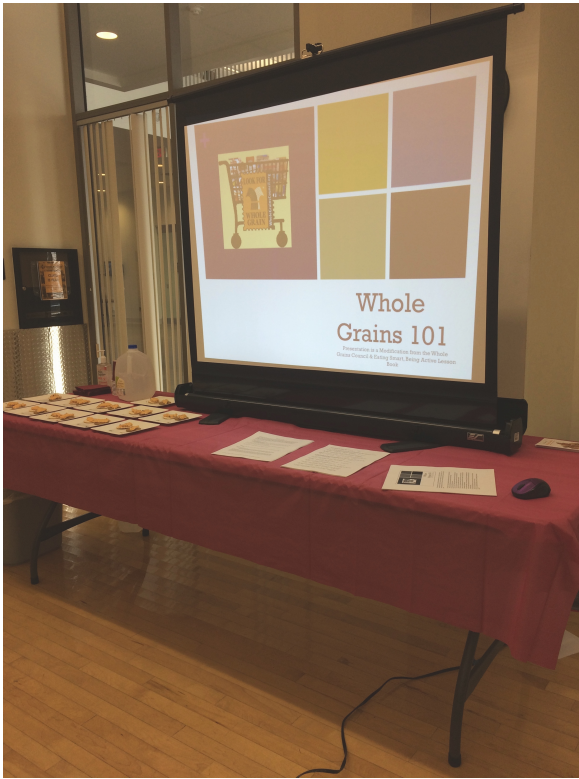
- at least 18 year old
- a University of Maine Dining Employee
- able to participate in the 3 one hour weekly sessions in November

Benefits to participation:

- Get fun tips, healthy recipes, and ways to eat healthy around the holiday season!
- Drawing for \$25 Hannaford gift card after each session
- **Earn 20 RiseUP points for participating in the program!**

Email [marissa.rublee@umit.maine.edu](mailto:marissa.rublee@umit.maine.edu) to enroll in the Program or with questions. Enrollment is limited.

## Appendix F: Program Set-Up



## Appendix G: Pre- Post- Questionnaire

Worksite Wellness for UMaine Dining Employees:  
Healthful Eating for the Holidays

Name: \_\_\_\_\_

### Knowledge and Use of Whole Grains

Please take a moment to fill out this survey that is a key aspect of Marissa Rublee's honors thesis research.  
You may skip any questions you do not feel comfortable answering. Thank you.

**1. How likely would you be able to define what "whole grain" means?**

Very likely    Somewhat likely    Neutral    Not very likely    Not likely at all

**2. How likely are you to be able to identify health benefits of whole grains?**

Very likely    Somewhat likely    Neutral    Not very likely    Not likely at all

**3. By looking at a food label, how likely would you be able to identify if the product is whole grain?**

Very likely    Somewhat likely    Neutral    Not very likely    Not likely at all

**4. When shopping, how likely are you to buy foods labeled "100% Whole Grain" rather than foods like breads, pastas and cereals, made with white flour?**

Very likely    Somewhat likely    Neutral    Not very likely    Not likely at all

**5. How likely are you to make modifications to recipes to incorporate whole grains?**

Very likely    Somewhat likely    Neutral    Not very likely    Not likely at all

**6. How likely are you to cook with 100% whole grains?**

Very likely    Somewhat likely    Neutral    Not very likely    Not likely at all

**7. How likely would you be able to explain what fiber is?**

Very likely    Somewhat likely    Neutral    Not very likely    Not likely at all

**8. How likely are you to select 100% whole grains when you make and/or eat holiday foods this year?**

Very likely    Somewhat likely    Neutral    Not very likely    Not likely at all

**9. How likely are you to set goals regarding whole grains around the holidays?**

Very likely    Somewhat likely    Neutral    Not very likely    Not likely at all

**10. Overall, how likely are you to increase your whole grain consumption?**

Very likely    Somewhat likely    Neutral    Not very likely    Not likely at all

## Appendix H: Lesson Plans



### Lesson 1: What are whole grains anyway? Whole Grains 101

**Format:** This is an Adult-Centered Education (ACE) lesson plan. ACE is structured around pair and group discussions. Adapted from WIC Healthy Habits Lesson Plan.<sup>33</sup>

**Who:** Adult University of Maine Dining Services employees

**Presented By:** Marissa Rublee, Honors College undergraduate student

**Why:** Whole grains are an important part of a healthy diet. It is recommended that one half of our grain intake be in the form of whole grain foods. Participants may be unclear as to what whole grain foods are and what foods contain whole grains. This lesson includes the basics of whole grains, why they are important in our diet, and how grains apply around the holidays.

**Time:** ~60 minutes

**Set up:** Chairs set up around a table with easy viewing of the projector screen.

**Goal:** To identify what changes in knowledge and intended behavior participants identify following a 3-class nutrition education program.

**Objectives:** By the end of this session, participants will be able to:

- Identify the difference between whole grains and refined grains.
- Identify three health benefits of whole grains.
- Use a food label to identify if a product is whole grain.

#### Lesson Overview:

1. Welcome! What exactly are whole grains anyway?
2. Recognizing whole grains is EASY!
3. Examining ingredient lists on foods commonly used around the holidays
4. Review and what to bring next time

#### Materials Needed:

- PowerPoint: Modification of Whole Grains Council's "Whole Grains 101" PowerPoint and Eating Smart, Being Active Lesson Plan
  - Projector and screen
  - Dongle for laptop
  - Laptop Mouse
  - Personal laptop
- Handouts:
  - "Welcome to Whole Grains" brochure by Whole Grains Council
  - Informed Consent
  - 10-item questionnaire (pre-assessment)



- Appetizer tasting worksheet
- Cracker ingredient labels
- Materials:
  - Pens
  - Slips of Paper
  - Crackers (100% whole and non-whole grain)
  - Appetizer spread
  - Plates
  - Napkins
  - Cups
  - Water
  - Tablecloths
  - Hand Sanitizer

**Getting Ready:**

1. Set Up:
  - a. PowerPoint presentation
  - b. Chairs around table
  - c. Area for food tasting and materials
2. Compile copies of “Welcome to Whole Grains” brochure by Whole Grains Council.
3. Compile copies of the informed consent to be distributed at the beginning of the program.
4. Compile copies of the 10-question pre-survey to be distributed at the beginning of the first lesson.
5. Make appetizers with crackers of 100% whole and non-whole grain crackers.
6. Compile worksheet and cracker label photocopies of appetizer tasting activity with space to write in whether the crackers are 100% whole grain and the fiber content.

**Lesson:**

**1. Welcome! What exactly are whole grains anyway?**

*“Good afternoon, my name is Marissa Rublee and I am a student in the Honors College here at UMaine. Thank you for participating in my research project. This is a learning experience for all of us and I am really looking forward to working with all of you!”*

*“My study is 3-lesson program about whole grains and how to incorporate them in what you eat and what you cook, especially around the holidays. Each session will be about an hour. There is a short 10-question survey I will give now and at the end of the lessons. To be in the study, I am asking that you read the consent form and complete the survey as evidence of your consent. The survey is not anonymous because I need your name to connect the surveys; however, the information you give will be held in confidence. I will only report the information as group averages. Also, after each session, I will do a drawing for \$25 Hannaford gift card for those in attendance and the RiseUP worksheets will be passed out at the end of the last session*

*to receive your 20 RiseUP points! Now please take a few minutes to read the consent form and, if you are willing, please sign as consent of participation in the study. Then, if you could please complete the survey if you are willing, that would be appreciated!"*

Distribute survey to participants; allow 5 minutes to complete.

**Presentation:**

Set: Begin with appetizer taste testing. Distribute samples to participants.

*"Now, what did you think of the appetizers? They were on two different types of crackers. Which was 100% whole grain? Invite participants to share responses.*

*"Today we are going to talk about how to identify whole grain foods and why eating whole grains is important. What comes to mind when you think of the term "whole grains?" Let's look at these slides to see what the Whole Grain Council has to say. (Slide 1-13)*

*"What whole grain products do you currently buy?" Invite participants to share their responses.*

*"What do you make with the whole grains you buy?" Invite participants to share their responses.*

Proceed with PowerPoint presentation until the slide titled, "How to identify whole grains fast!" (Stop at slide 13)

**2. Recognizing whole grains is EASY!**

*"How many of you feel you can clearly identify whole grain products in the grocery store?" Invite participants to raise their hands.*

*"How do you typically determine if a product is whole grain?" Invite participants to share response.*

*"Well, here are some simple guidelines to help you make sure you are getting the "real deal!" (Slides 13-14) Proceed with PowerPoint until the "Activity" slide (Slide 15).*

**3. Examining ingredient lists on foods commonly used around the holidays**

*(View slide 15) "Now that we just went over what whole grains are and how to identify whole grain ingredients, let's take a look at some cracker labels from the appetizer we had earlier." Break up into five groups of two; distribute food labels to each group.*

Describe activity. Allow 2-4 minutes to discuss in pairs and then invite participants to report back to the group.

*“Which food is whole grain and which is refined?”* Ask pairs of participants to share the specific ingredients that indicate whole grain or refined.

*“Was it difficult to determine the difference between the two food labels?”* If participants indicate yes, emphasize that it takes practice.

#### **4. Review and what to bring next time**

*“Making at least half of your grains whole is a healthy habit, especially around the holidays! I have a little brochure here for you from the Whole Grains Council that outlines some important information about whole grains. You can take this home and use it as a reference!”* Distribute brochure to participants.

*“So, today we looked at the benefits of whole grain consumption and showed you how to identify whole grains by looking at the ingredient list.”*

*(View slide 16-17) “Just as a review, who can answer this question?”* Show “Review” slide and invite a participant to respond.

*“Is there anything from today’s session that you think you might find useful over this holiday session?”* Invite participants to respond.

*(View slide 18) “Think about some of the foods items we identified today as whole grain. For next time, please bring in a holiday recipe that uses rice so we can take a look at it.”*

*(View slide 19) “As we come to a close, feel free to contact me at any time if you have questions about what we went over by email at [marissa.rublee@umit.maine.edu](mailto:marissa.rublee@umit.maine.edu).”* Show PowerPoint slide.

Do drawing for \$25 Hannaford gift card.

*“Thank you for participating in this session today and I look forward to seeing you **all** next week, November 12<sup>th</sup> at 2:30pm. And don’t forget your holiday recipe!”*

• • •

**Lesson 2:** Substituting Whole Grains Around the Holidays!



**Format:** This is an Adult-Centered Education (ACE) lesson plan. ACE is structured around pair and group discussions. Adapted from WIC Healthy Habits Lesson Plan.<sup>33</sup>

**Who:** Adult University of Maine Dining Services employees

**Presented By:** Marissa Rublee, Honors College undergraduate student

**Why:** Whole grains are an important part of a healthy diet. It is recommended that one half of our grain intake be in the form of whole grain foods. Participants may be unclear as to what whole grain foods are and what foods contain whole grains. This lesson includes the basics of whole grains, why they are important in our diet, and how grains apply around the holidays.

**Time:** ~60 minutes

**Set up:** Chairs set up around a table with easy viewing of the projector screen.

**Goal:** To identify what changes in knowledge and intended behavior participants identify following a 3-class nutrition education program.

**Objectives:** By the end of this session, participants will be able to:

- Identify one way to modify a holiday recipe to incorporate whole grains.
- Identify the amount of water needed and cooking times for two different whole grains.
- Identify two ways their family can incorporate whole grains into meals around the holidays.
- Identify the amount of fiber in bulgur and varieties of rice.

**Lesson Overview:**

1. Welcome! Show and Tell of Holiday Recipes
2. Cooking with Whole Grains is EASY and Some Simple Substitutions
3. Tasting and Discussion
4. Your Family and Whole Grains

**Materials:**

- PowerPoint: Materials from Whole Grains Council Website and Eating Smart, Being Active Lesson Plan
  - Projector and screen
  - Personal laptop
  - Laptop Mouse
  - Dongle
- Handouts:
  - Recipe from food tested (Brown Rice Tabbouleh)
  - “Cooking Whole Grains is Easy” worksheet
- Materials:
  - Tablecloths
  - Plates
  - Forks
  - Napkins
  - Hand sanitizer
  - Cups

- Water
- Rice box (instant and regular)
- Bulgur box
- Holiday Recipes with Rice/Bulgur
- Pens
- Tabbouleh recipe printed
- Tabbouleh recipe samples

**Getting Ready:**

1. Set-up:
  - a. PowerPoint presentation
  - b. Chairs around table
  - c. Area for food tasting and materials
2. Gather printed recipe of food being tasted and “Cooking Whole Grains is Easy” handout.
3. Divide recipe into appropriate tasting portions.
4. Set up table with recipes and rice/bulgur boxes.
5. Have recipe printed out by food being tested.

**Lesson:**

**1. Welcome! Show and Tell of Holiday Recipes**

*“Good afternoon! It’s great seeing you all back today. Today we will be talking about how to use whole grains and make whole grain substitutions around the holidays!”* Have PowerPoint showing on screen.

Set: If you brought a holiday recipe today, feel free to set it on the table and look at some of the ones provided. Also, please take a look at the rice and bulgur products on the table as well because we will be focusing on those two types of grains as a part of what we do today.

*“What recipes do you have to share?”* Invite participants to share their recipe, what whole grain the recipes uses or how they might modify it. Listen, but wait to provide feedback.

*“So today, keep in mind the modifications you suggested regarding your recipe, and at the end of this lesson, you will hopefully have a better idea of how to make specific whole grain modifications to your holiday recipes!”* Proceed with PowerPoint presentation (Slide 2).

**2. Cooking with Whole Grains is EASY and Some Simple Substitutions**

*“Many people do not try different whole grains because they do not know how to prepare them or they do not know how they taste. Do you fall into one of those categories?”* Invite participants to raise their hands.

(View Slide 3) “Cooking whole grains is easy. **Just add water!** The main difference between grains is the amount of water used and the cooking time. Let’s take a minute to look at the “Cooking Whole Grains” chart and see the differences.” Distribute chart and refer to the “Cooking Whole Grains” chart handout on PowerPoint slide (Slide 4).

“Let’s look at brown rice.” (Remain on Slide 4).

“How many of you have cooked brown rice before?” Invite participants to raise their hand or answer.

Read from the chart the cooking instructions for this whole grain.

*“For one cup of brown rice  
add 2 cups of water.*

*Bring to a boil and simmer for approximately 25-45 minutes (varies).*

*Notice that it makes about 3-4 cups.”*

Note: Brown rice takes much longer to cook (about 45 minutes versus 15-20 of white rice) so you can cook brown rice ahead of time, freeze it, then thaw when desired.

\*Note the fiber content of brown rice.

*Note for PowerPoint:* “From Cynthia Harriman of the nonprofit Whole Grains Council. Regular and instant brown rice products have no appreciable difference in the nutrient profiles of regular versus quick-cooking. Both are considered whole grains, and both are good sources of manganese, magnesium, selenium and fiber.

In addition, unlike instant vs. slow-cooked oatmeal, instant brown rice in some cases actually has an equivalent or even a lower glycemic index (raises blood sugar more slowly) than longer-cooking rice. Lower glycemic index diets have been linked to a reduced risk of heart disease, diabetes and age-related macular degeneration, the leading cause of blindness in Americans.

So you don't have to spend an hour in the kitchen to enjoy the healthy, whole-grain benefits of brown rice. Just watch your serving size, as brown rice is still somewhat carbohydrate-dense, so the overall impact on your blood sugar and total caloric intake is still significant if you consume too much.”

“Now let’s choose a grain that might not as familiar to you.” Choose bulgur.

Read from the chart the cooking instructions for this whole grain.

*“For one cup of bulgur,  
add 2 cups of water or broth.*

*Bring to a boil and simmer for 10-12 minutes.*

*Notice that it makes about 3 cups.”*

Note: Bulgur is often used in pilafs, soups, bakery items, or as stuffing! It is also the main ingredient in tabbouleh.

\*Note fiber content of bulgur.

*“Using the chart, you can see that cooking with whole grains is slightly different and cook times vary based on desired texture—always something to keep in mind. It may take some experimenting to get used to!”*

*“Keeping in mind cooking with whole grains, there are several substitutions that can be made to recipes you already have—you don’t have to start from scratch!”*  
Proceed with PowerPoint presentation.

*“Have you tried any of these substitutions before? Are there any you would like to try?”* Invite participants to share response.

*“Thinking about the substitutions we just went over, the obstacles of holiday eating does not have to keep you from reaching your health goals, so you can start now. Here are some simple tips to conquer that holiday buffet, for example, so you don’t feel like you have to wait until after the holidays to make some changes.”* Proceed with PowerPoint.

### **3. Tasting and Discussion**

Optional: Distribute taste test sample.

Provide small samples of the prepared food for participants to try.

*(Slide 8) “Now that we have talked about how to cook with whole grains and how to make some simple substitutions, I have a recipe for us to try.”* Distribute taste test to those interested in participating. Distribute recipe alongside the sample.

*“What were your initial thoughts when trying this brown rice tabbouleh recipe? How was the texture?”* Invite participants to share responses.

*“What reaction do you think your family would have to this recipe?”* Invite participants to share responses.

### **4. Your Family and Whole Grains**

*“Making at least half of your grains whole is a healthy habit. Today we showed you how to cook with whole grains and to use whole grains in recipes.”*

*(View Slide 9) “Think about your next trip to the grocery store. Keeping in mind what you tasted and the recipe I gave you, what whole grains do you think you might buy next time keeping the holidays in mind?”* Invite participants to share responses.

*“Looks like many of us would like to try \_\_\_\_\_. That’s great!”* Notice what is different or the same for participants now.

*“Again, feel free to email me with any questions you may think of.”*

Do drawing for \$25 Hannaford gift card.

(View Slide 10) “Thank you for participating today and I look forward to seeing you all for our last session next week on November 19<sup>th</sup> at 2:30pm!

**Attachments:**

- Cooking Whole Grains Chart
- Brown Rice Tabbouleh recipe

**Cooking Whole Grains is Easy\***

<b>To 1 cup of this grain:</b>	<b>Add this much water or broth</b>	<b>Bring to a boil, then simmer for:</b>	<b>Amount after cooking</b>
Barley, hulled	3 cups	45-60 minutes	3 ½ cups
Bulgur	2 cups	10-12 minutes*	3 cups
Oats, steel cut	4 cups	20 minutes	4 cups
Oats, rolled (Old Fashioned)	1 ¾ cups	5 minutes	1 ¾ cups
Oats, quick or instant	1 ¾ cups	About 1 minute	2 cups
Rice, brown	2 cups	25-45 minutes (varies)	3-4 cups
Rice, brown instant	1 ¾ cups	8-10 minutes	4 cups

\*Reference: <http://www.wholegrainscouncil.org/>

Use less water for a firmer grain and more water for a softer grain. Store cooked grains in a covered container in the refrigerator for up to one week or in the freezer for up to 6 months.

\* Another method for cooking bulgur:

1. Bring water to a boil.
2. Add bulgur.
3. Turn off heat, cover with lid and let sit for 10 minutes.



Recipe

**BROWN RICE TABBOULEH**

(6 servings)

3 cups cooked brown rice  
3/4 cup chopped cucumber  
3/4 cup chopped tomato  
1/2 cup chopped fresh parsley  
1/4 cup chopped fresh mint leaves  
1/4 cup sliced green onions  
1/4 cup olive oil  
1/4 cup lemon juice  
1/2 teaspoon salt  
1/4 teaspoon freshly ground black pepper

Combine rice, cucumber, tomato, parsley, mint, green onions, olive oil, lemon juice, salt and pepper in large bowl. Toss well and chill.

**Nutrition Facts:** (per 1/6 of recipe), Calories, 201; Total Fat, 10g; Sodium, 204mg; Total Carbohydrate, 25g; Dietary Fiber, 2g; Protein, 3g.

**SOURCE:** University of Nebraska-Lincoln: <http://food.unl.edu/fnh/cooking-brown-rice#tabb>

*Recipe courtesy of the USA Rice Federation. For more information about rice, visit [www.usarice.com](http://www.usarice.com)*

• • •

**Lesson 3:** Setting Goals to Keep Whole Grains in Holiday Fun



**Format:** This is an Adult-Centered Education (ACE) lesson plan. ACE is structured around pair and group discussions. Adapted from WIC Healthy Habits Lesson Plan.<sup>33</sup>

**Who:** Adult University of Maine Dining Services employees

**Presented By:** Marissa Rublee, Honors College undergraduate student

**Why:** Whole grains are an important part of a healthy diet. It is recommended that one half of our grain intake be in the form of whole grain foods. Participants may be unclear as to what whole grain foods are and what foods contain whole grains. This lesson includes the basics of whole grains, why they are important in our diet, and how grains apply around the holidays.

**Time:** ~60 minutes

**Set up:** Chairs set up around a table with easy viewing of the projector screen.

**Goal:** To identify what changes in knowledge and intended behavior participants identify following a 3-class nutrition education program.

**Objectives:** By the end of this session, participants will be able to:

- Identify the difference between soluble and insoluble fiber.
- Identify a goal for the holidays regarding 100% whole grain consumption.
- Identify a goal for the new year regarding 100% whole grain consumption.

**Lesson Overview:**

1. Welcome! Recap from Last Week and What's Next
2. What's the deal with fiber and whole grains?
3. Looking ahead at the holidays!
4. Wrap-Up and Final Message

**Materials Needed:**

- PowerPoint: Materials from Whole Grains Council Website and Eating Smart, Being Active Lesson Plan
  - Projector and screen
  - Personal laptop
  - Laptop Mouse/Dongle
- Handouts:
  - Recipe of Peanut butter Chocolate Chip Teff Cookies
  - "Make Half Your Grains Whole" flier from ChooseMyPlate.gov
  - 10-item questionnaire (post-assessment)
- Materials:
  - Pens
  - Slips of Paper
  - Plates
  - Cups
  - Water
  - Napkins
  - Utensils
  - Table Cloths
  - Hand Sanitizer
  - \$25 Hannaford Gift Card

**Getting Ready:**

1. Set Up:
  - a. PowerPoint presentation
  - b. Chairs around table
  - c. Area for food tasting and materials
2. Gather recipe cards from Whole Grain Council website.

3. Compile copies of “Make Half Your Grains Whole” flier from ChooseMyPlate.gov.
4. Compile 10-question post survey to be distributed at the end of the session.

**Lesson:**

**1. Welcome! Recap from Last Week and What’s Next**

*“Good afternoon! It’s great to see you all back for our last session today—can you believe it’s been three weeks already?”*

Set: *“So far we have tried a simple appetizer and a side dish. Today I have a sample of a desert, Peanut Butter Chocolate Chip Teff Cookies, for us to try!”* Distribute samples (optional).

*“What are you thoughts on the cookie? How do you feel the whole grain ingredients affected the overall desert?”* Invite participants to respond.

*(View Slide 2) “Today we will be talking about what’s next for us and about how to set some healthy eating goals as we head into the holiday season. First, how many have you noticed yourselves being more conscious of your whole grain consumption just over the past few weeks?”* Invite participants to share responses.

*“That’s great! I’ve actually found myself looking at ingredient labels more and more—so this is helping me, too!”*

**2. What’s the deal with fiber and whole grains?**

Transfer attention to PowerPoint presentation.

*“Now, before we dive into goal setting, what are some things that seem important to you about fiber?”* Note: Ask participants to provide their opinion. Do not give yes or no answers at this time; proceed with PowerPoint (*Slides 3-7*).

*“Okay, good. Today we are going to clear up any confusion there may be about fiber and whole grains to make sure we are all on the same page.”* Proceed with PowerPoint presentation.

Note: It is very important to maintain fluid intake when increasing fiber intake in order to allow for proper fiber utilization.

Transfer attention to PowerPoint presentation.

*“Now, before we dive into goal setting, what are some things that seem important to you about fiber?”* Note: Ask participants to provide their opinion. Do not give yes or no answers at this time; proceed with PowerPoint (*Slides 3-7*).

*“Okay, good. Today we are going to clear up any confusion there may be about fiber and whole grains to make sure we are all on the same page.”* Proceed with PowerPoint presentation.

Note: It is very important to maintain fluid intake when increasing fiber intake in order to allow for proper fiber utilization.

### **3. Looking ahead at the holidays!**

*“Now that we just went over what exactly fiber is and what constitutes as a high fiber food, let’s talk about how to set some reasonable holiday goals.”*

*(View Slide 9) “Staying on track around the holidays is a challenge when you’re surrounded by amazing food. But it is possible to maintain a healthy diet. By setting a few goals focused around the holidays, you can stay on track!”* Proceed with PowerPoint presentation on goal setting (Slides 9-15).

#### **Activity:**

*(View Slide 16) “Okay, now we are going to break into pairs and do an activity to get us thinking about some possible goals. I would like you each to think of a goal regarding whole grains around the holidays and a goal for the New Year while keeping in mind the guidelines we just discussed regarding goal setting.”* Allow 5 minutes for pair to discuss. Then invite participants to share their responses. Proceed with PowerPoint presentation examples.

*“So, as you can see, there are many specific goals you can make to improve your whole grain consumption around the holidays, that is clear. I have quick, easy, and healthy recipe here to show you.”* Show PowerPoint presentation slide of recipe (Slide 17). Invite participants to share their opinions on the recipes.  
Note: Recipes will be available for those two pick up after the lesson if desired.

### **4. Wrap-Up and Final Message**

*(View Slide 18) “Making goals regarding health and nutrition is something that is crucial in making lifestyle changes. While making goals is one thing, sticking to them is another. By focusing on goals around the holidays, you will likely enjoy a happier and healthier holiday season!”*

*“So, over the course of these lessons, we have learned about what whole grains are, why they are beneficial, how to make simple yet delicious substitutions, what exactly fiber is, and how to make goals while keeping in mind the holiday season that is right around the corner.”*

*“Do you feel you have a better grasp on whole grains than you did when you first attended? What is the most beneficial thing you feel you have learned over the past three weeks?”* Invite participants to share responses.

*“Does anyone have any final comments or questions?”* Invite participants to share responses.

*“I have a brochure on Whole Grains for you to take home as a reference.”*  
Distribute brochure to participants.

*We will have the drawing for the \$25 Hannaford gift card and then I will pass out the survey for my research project. Please remember to put your name on the survey.”* Allow participants time to complete survey.

*“Thank you for participating in my program. I hope you all learned something that you can take home with you and I look forward to seeing you around on campus!”*

## **Appendix I: Informal Program Evaluation Questions**

*Worksite Wellness for UMaine Dining Employees  
Healthy Eating for the Holidays, 2014*

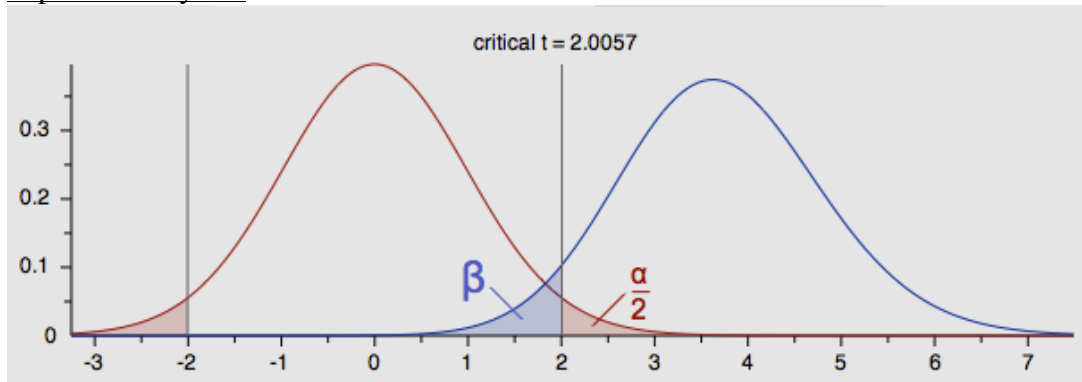
### **Informal Program Evaluation**

*Questions were asked verbally and participants recorded their answers if they were comfortable doing so.*

1. What did you like most about the course?
  
2. What specific things did you like least about the course?
  
3. If the course was repeated, what should be left out, changed, or added?
  
4. Overall, I would rate this workshop as:  
\_\_\_Excellent  
\_\_\_Good  
\_\_\_Average  
\_\_\_Poor

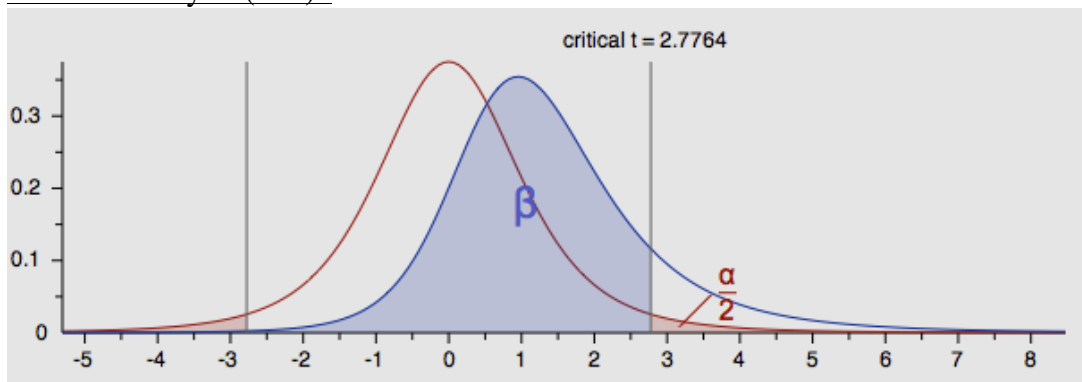
## Appendix J: A priori and Post hoc Results

### A priori Analysis\*



\*Power ( $1 - \beta$  err prob)=0.95

### Post hoc Analysis (n=5)\*



\*Power ( $1 - \beta$  err prob)=0.14

### Author's Biography

Marissa Rublee was born in Glenburn, Maine and has been a proud resident of Maine ever since. She graduated from John Bapst Memorial High school in 2011. As a Mainer, Marissa enjoys hiking in Acadia and camping. She also has a strong passion for photography and fitness. She has worked at the New Balance Student Recreation Center since her first year and has really enjoyed working in the fitness environment. During her time at the University of Maine, she has been on the Dean's list every semester, a member of Kappa Omicron Nu National Honor Society, Alpha Lambda Delta Honor Society, Phi Kappa Phi National Honor Society, and Order of Omega Honor Society. Marissa is also a sister of Alpha Omicron Pi Sorority, where she has served as the Vice President of Academic Development and as the Property Manager.

After graduation, she will be attending the combined Master of Science Dietetic Internship program at the University of Maine to continue on the path of becoming a registered dietitian. She would love to explore the world as she begins her career as a dietitian, but eventually she sees herself coming back to Maine to live in the place that has always been home.