Education of Food Service Workers on Gluten-Free Diets

Lisa Pleasants

NED 690: Graduate Thesis Project

Spring 2006

Table of Contents

Abstract

Celiac Disease (CD) is a genetically determined chronic inflammatory disease of the small intestine. When stimulated by gluten, the immune system attacks the villi of the small intestine, leading to nutrient malabsorption. The only known solution for the disorder is to strictly follow a gluten-free diet. Two cooks at St. Joseph's University participated in a study to potentially broaden their knowledge of gluten-free diets and how to effectively prepare gluten-free meals without risk of cross-contamination. The subjects were given pre- and post-tests on gluten-free meals, with an education session in between to provide additional knowledge of gluten-free diets. The cooks had previously prepared gluten-free meals, so they were familiar with the diet restrictions before the study. Their pre-test scores were above the 81st percentile because of this prior knowledge. The results of the study were mixed, indicating that one subject improved their knowledge and the other subject maintained the knowledge they had previously. There was some difficulty in conducting the study due to changes in personnel, so it is recommended that the study be conducted immediately to avoid such obstacles in the future. Conducting the study in multiple sessions may also add to participation in the study, leading to increased knowledge among the cooks. Also, providing education in more than one manner may also aid the educational process for those who may not learn in a traditional lecture manner. Education of other topics, such as food safety, could also be added to increase the scope of education among foodservice workers at SJU.

Chapter 1

Problem

Celiac Disease is a lifelong autoimmune disorder that affects the small intestine of the GI tract in genetically predisposed people. People who suffer from the condition cannot tolerate the amino acids found in gluten-containing grains such as wheat, rye and barley, so when these are consumed, they damage the mucosa lining of the small intestine causing malabsorption of nutrients (Escott-Stump, 2002). Approximately 3 million Americans suffer from the condition, which makes finding foods to eat difficult outside of the home. (Celiac Disease Foundation, 2005).

Going away to college is a stressful time for all young adults, but for those who suffer from celiac disease, it can be overwhelming. Most school cafeterias do not accommodate students who suffer from food allergies, especially not gluten allergies. This semester a few students with gluten allergies have enrolled at Saint Joseph's University. Their parents made phone calls about getting appropriate foods for their teens and in some cases, brought in food for the students. This sparked an idea to offer a gluten-free menu for this sector of the student population daily.

Ordering and serving gluten-free foods at Saint Joseph's University is not as simple as it seems. It is very important that there is not cross-contamination between gluten-free food and anything that contains gluten, so proper education of the cooks is essential. If there is cross-contamination, the celiac-sufferer is at risk for early onset osteoporosis, weight loss, constipation, bloating, fatigue, anemia, vitamin deficiencies, diarrhea, abdominal pain and gas. (Celiac Disease Foundation, 2005)

The cooks at Saint Joseph's University have been unaware of the dangers of not following safe food preparation techniques. By educating the foodservice workers at Saint Joseph's University about Celiac Disease and how to properly prepare and serve the gluten-free food, it was hoped to increase the likelihood that students who require gluten-free diets were served food that is safe for their consumption.

Purpose

The purpose of this research was to develop, implement, and evaluate a program to educate the foodservice workers at Saint Joseph's University about gluten-free diets and the necessary precautions to observe when they were, and still are, preparing and serving this food. The goal was to ensure that vulnerable students had a lower risk of cross-contamination and gluten-related side effects. This was accomplished by providing education to the foodservice workers, namely the cooks, about gluten-free diets and how to safely prepare them without cross contamination with gluten-containing foods. It was especially important to conduct this study at Saint Joseph's University because there are many students who attend this school with gluten intolerance or Celiac disease who need gluten-free diets and safe food preparation techniques. While this study is only being performed at St. Joe's, it is research that can be done at any college or university to ensure that the foodservice staff, and namely the cooks, are educated about the different diets and understand the importance of safe food preparation techniques.

Hypothesis

After participating in the study and receiving education regarding gluten-free diets, the foodservice workers at St. Joseph's University were expected to demonstrate

an increased knowledge of gluten-free diets and their safe preparation. This change in knowledge was measured by the difference in scores between a pre and post-test.

Chapter 2

Review of Literature

In 2005, the United States Department of Agriculture (USDA), as part of the Department of Health and Human Services (HHS), released the new dietary guidelines for Americans, in conjunction with a new Food Guide Pyramid (FGP). The USDA recommends increasing dietary fiber intake by consuming fruits, vegetables, and whole grains in order to prevent diseases such as hypertension, heart disease, diabetes, and some cancers, as well as promote overall physical health. Just as in previous years, the predominant portion of the FGP contains grains, with at least six servings of whole grains recommended daily for the average adult American. (USDA, 2005). For the average person, these recommendations provide vitamins and nutrients and improve their overall health, but for people afflicted with Celiac Disease, this recommendation can actually be detrimental to their health.

Following the FGP is challenging enough for any young adult going away to college. There is a freedom of choice from being on your own that one does not have when living at home. Most college cafeterias have many healthy, and not so healthy, options to choose from, leading to the dreaded "Freshman 15" weight gain that affects many new students. These choices are even more difficult when a student has a food allergy, such as Celiac Disease, and is limited in the foods they can eat.

Celiac Disease

Celiac Disease (CD) is a genetically determined chronic inflammatory disease of the small intestine that is precipitated by consumption of gluten, or gluten-containing foods, such as wheat, rye, barley, malt and in some cases, oats. (Peraaho et al., 2004).

When stimulated by gluten, the immune system attacks the villi of the small intestine, which leads to the malabsorption of nutrients such as iron, folic acid, calcium and vitamin D. Symptoms of Celiac Disease can vary widely from one sufferer to another. Some people with malabsorption suffer from anemia and osteoporosis, with complications such as short stature, impaired fertility, miscarriages and neurological problems, such as seizures or difficultly walking. Other people have manifestations that include severe diarrhea, leading to dehydration which if left untreated, can result in death. (Harvard Women's Health, 2001).

CD is prevalent and recognized in European countries, with as many as 1 in 130 people are affected by the disorder. In such countries, testing for the disorder is done routinely, leading to early detection and treatment of the disorder. In the United States, where there are as many as 1 in 300 sufferers who are recognized, CD is not as easily diagnosed. (Harvard Women's Health, 2001). A study performed by the University of Maryland in February 2003 on 13,145 subjects found that 1 in 133 people suffer from the disorder. It was also found that because this is a genetic disorder, it was much more common in those with first and second-degree relatives who have the disorder. In addition, multiple studies have found that it takes approximately twelve years for an official CD diagnosis. (Schoenhals, 2005).

Celiac Disease Diagnosis

According to the National Institute of Diabetes & Digestive & Kidney Disease (NIDDK), which is part of the National Institute of Health (NIH), one reason for the difficulty in diagnosing CD is that the symptoms can be similar to those of other disorders, such as irritable bowel syndrome, Crohn's disease, diverticulitis, or lactose

intolerance. (Schoenhals, 2005). Most adult patients have symptoms such as diarrhea, flatulence, weight loss or general weakness. However, it should be noted that up to 50 percent of CD patients report no gastrointestinal symptoms and only have symptoms of fatigue or anemia. (Harvard Women's Health, 2001).

In order to properly diagnose CD, there should be a physical exam, lab values drawn, and, in order to officially diagnose the disorder, a small intestine biopsy should be performed. (Green et al., 2003)

The physical exam may reveal a loss of muscle mass, pale complexion, and easy bruising of the skin; the abdominal exam may show distention and hyperactive bowel sounds. (Luchtefeld et al., 2003) The American Gastroenterological Association reports the diagnosis of CD is made when a small intestine biopsy shows abnormalities of the villi. It is officially diagnosed when improvement to the villi is seen after adherence to a gluten-free diet. (Green et al., 2003)

Celiac Disease Treatment

The treatment for Celiac Disease is to follow a gluten-free diet, which means eliminating wheat, rye, barley, and malt from the diet. While most people tolerate oats in the diet, it is important to read the food labels to ensure the food does not have cross-contamination with any gluten-containing ingredients, including some additives, emulsifiers and stabilizers. In general, rice, soybean, potato and corn flours are recommended for CD sufferers. (Luchtefeld et al., 2003). If a gluten-free diet is strictly followed, symptoms can improve within days, and the small intestine can heal itself within a few months. (Green, et al., 2003). However, it should be noted that this is a lifetime ailment that must consistently be treated or symptoms will reoccur.

One difficulty with consuming a gluten-free diet is that many gluten-free foods do not contain the same levels of folate and iron that gluten-containing foods do, so deficiencies can occur. The Food and Drug Administration recommends that all women of childbearing age consume at least 400ug of folate per day. (Thompson, 2001). According to the American Gastroenterological Association, it is generally accepted that the prevalence of CD is 2:1 for women versus men. (Ciclitira et al., 2001) Because gluten-free foods do not have to be fortified, many women with CD often come in below the recommended folate and iron levels, which can lead to birth defects and anemia if not supplemented. People with CD, especially women and adolescents, should be encouraged to consume foods high in these nutrients, such as green leafy vegetables, orange juice, fish and legumes. In addition, a gluten-free multivitamin should also be used to supplement the gluten-free diet. (Thompson, 2001).

Impact on Lifestyle

For most people, eating is more than just the actual consumption of food. It is a medium for socializing and spending time with friends and family. When diet limitations occur, such as in CD, it impacts a person's lifestyle and their ability to feel like they fit in. This can impact adherence to the gluten-free diet. According to a study conducted by the American Dietetic Association, 26 percent of participants did not adhere to their diets when out at a restaurant and 21 percent did not adhere when at a party or social function. These people did not adhere to their diets because they were too restrictive, according to the study. (Lee et al., 2003).

Similarly to this study, college students who are away from home for the first time would have difficulty adhering to their restrictive diet, especially if the college cafeteria

does not cater to a gluten-free population. For those college campuses that do offer gluten-free options, it is important that the foodservice staff, namely the cooks, understand the importance of proper food handling techniques to ensure there is no cross-contamination with gluten-containing ingredients.

Cross-Contamination Concerns

One of the most important things to watch out for when it comes to safe food preparation is to avoid cross-contamination of foods that could lead to an allergic reaction if ingested. An allergy is defined as "exaggerated or pathological reaction (as by sneezing, respiratory embarrassment, itching, or skin rashes) to substances, situations, or physical states that are without comparable effect on the average individual." (Merriam-Webster, 2005). For the purpose of this study, the primary concern is gluten-containing foods.

Because certain allergens can contaminate other foods, it is important that there is not cross-contamination between foods that contain potential allergens and those that do not. When cross-contamination occurs, each food contains small amounts of the other food that may be undetectable by the cook or consumer until it is too late. For people with severe food allergies, a very small amount can set off a reaction. Because food allergies are becoming more prevalent, many food manufacturers are taking precautions to prevent cross-contamination by running products containing allergens last or on a separate line. Food manufacturers also note on their product labels potential allergens to alert the public of potential ingestion, even if those ingredients were processed in the same plant during preparation. (Indorato, 2005).

In addition, even using the same frying oil for foods that contain gluten and those that are gluten-free runs the risk of cross-contaminating the foods. The high temperature of the oil is not hot enough to denature the protein that causes the allergy and if crumbs break off in the hot oil when frying breaded items, such as chicken fingers, they will remain when frying gluten-free items, such as French fries. (Indorato, 2005).

Cross-contamination also occurs from using the same cutting boards repeatedly without proper cleaning and sanitizing between potentially dangerous ingredients, using the same serving utensil for more than one item without sanitizing in between uses, and wiping off a table without properly cleaning and sanitizing. Foodservice staff should be taught not to wipe hands on aprons, cloths used in the kitchen should be changed frequently, and hands should be washed as frequently as possible when working in the kitchen. If possible, there should be a separate area to prepare the gluten-free meals in order to reduce the likelihood of cross-contamination. (Indorato, 2005).

Foodservice Education

Approximately 11 million people suffer from food allergies in the United States.. As many as 30,000 hospital visits and up to 200 deaths per year are the result of reactions to allergy-containing foods that are unintentionally ingested outside the home. (Cohn, 2002).

According to the Journal of Environmental Health, foodborne illnesses cost approximately $7.7 to $23 billion per year to consumers, the food industry and the national economy. In addition, the Food Safety Inspection Service (FSIS) reports that hospitalizations due to foodborne illnesses cost approximately $3 billion per year with

productivity losses between $20 and $40 billion per year. (FDA & FSIS, 2002). In addition, it is reported that about three-quarters of the 76 million cases of foodborne illness that occur annually in the United States are the result of improper foodservice handling. (CDC, 2000).

Currently there are 17 states that mandate food safety certifications, with Pennsylvania being one of those states, and the only one in the tri-state area. Fifteen hours of training are required for certification in Pennsylvania and 7.5 hours additional for recertification, though it was not clear how often recertification is required. However, Delaware is part of a contingent of states that require the person in charge of a foodservice operation to be able to demonstrate knowledge of food safety that is modeled after the FDA Food Code. (Alamanza, 2004). The FDA Food Code is a model to develop and update food safety regulations that provides consistency throughout the industry, including restaurants, grocery stores, healthcare institutitions such as nursing homes, as well as colleges or universities. (USDHHS, FDA, 2005). The Food Code is updated every few years with the latest regulations added or adjustments made to previously reported codes. The latest edition was released in September 2005.

It is widely accepted that foodservice workers are to be trained on proper sanitary and food handling techniques to ensure food safety. Health care dietetics services and colleges/universities have established standards in both local and state regulations to ensure food safety. Studies have shown that people are unlikely to participate in formal education programs unless they are required to, such as at a hospital or university. Commercial and volunteer settings do not require formal education programs for safe food preparation techniques. (Manning, 1994).

The American Dietetic Association conducted a study to determine whether there were differences in safe food handling knowledge between those who were formally trained and those who were not. This was done by distributing questionnaires to both institutional and commercial foodservice workers with questions related to temperature control, cross contamination, cooling and reheating, personal hygiene and general food handling practices. The results of the study prove that foodservice workers in institutional settings have a better understanding of safe food preparation techniques. (Manning, 1994).

While it is important to educate foodservice workers about proper food handling techniques to lessen the occurrences of foodborne illness, it is just as important to educate the staff about food allergies and the importance of adhering to diet restrictions when preparing specialized meals for allergy sufferers. The manager should be the person who informs the foodservice workers of proper food preparation techniques, including developing and selecting the menu, as well as providing training on potential allergies to prevent cross-contamination in the kitchen and dining area. (Cohn, 2002).

Chapter 3

Methodology

Subjects

The subjects of this study were the eight cooks at St. Joseph's University. The subjects were all African-Americans, both male and female, with the age range of 35 to 60 years old. The subjects live in the city of Philadelphia and have at least a high school equivalent education level. A few of the subjects went to trade school beyond high school for further education. All the cooks at St. Joseph's were eligible to participate, so there was no exclusion factor other than job description involved in this study. In addition, all subjects were in good health, both mentally and physically, so there were no limitations to the subjects' participation in the study.

This study was conducted at St. Joseph's University, whose foodservice department is run by Aramark. As a former location manager and clinical dietitian, as well as current consultant for Aramark at St. Joseph's University, the researcher was granted access to the subjects (See Appendix A for authorization letter) by the Foodservice Director, Gregory Harlan, as well as the Director of Security, Albert Hall, who was responsible for the Aramark foodservice program at St. Joseph's University. Mr. Hall developed the standards that Aramark must adhere to in order to keep the foodservice contract at St. Joseph's University, so he was the appropriate person to grant access for the researcher to conduct the study on campus.

Instruments

Both the pre- and post-tests were identical to measure any change in knowledge based on the questions on the test. (See Appendix C) The test was developed utilizing

basic information about gluten-free diets obtained from websites designed to educate people with gluten allergies or Celiac disease. The Celiac Sprue Association breaks down the gluten-free diet into common terms so it is easy for people who are not familiar with medical terms to understand the gluten-free diet. The researcher chose to use a website designed for the average population when developing the pre- and post-tests to assure that the information in the test would be easily understood by the subjects of the study. (Celiac Sprue Association, 2005)

The education session included a discussion of gluten-free diets, where the researcher provided written materials on gluten-free diets and safe preparation techniques. In addition, there was a question and answer portion of the education session where the subjects could ask questions about gluten-free diets and how to safely prepare the food in the kitchen setting.

Procedure

The researcher received verbal consent from the subjects in order for them to participate in the study. (See Appendix B) The subjects were informed that they did not have to participate in the study and there would not be any negative impact on their jobs if they did not participate.

To conduct the study, the researcher gathered the cooks during a scheduled break to take a pretest on gluten-free diets, including what gluten is, what foods contain gluten and the proper techniques to avoid dangerous cross contamination with gluten-containing foods during preparation. (See Appendix C) Following the pre-test, there was an education session where the subjects listened to a lecture on gluten-free diets, received written materials for reference and educational purposes and participated in a

question and answer session. The researcher conducted the study at the end of the spring semester when the workload was lighter for the cooks and they had more downtime for them to participate in the study. In all, the study took approximately 60 minutes including the questions during the question and answer session.

In order to assure anonymity, the researcher enlisted the aid of a supervisor to administer the pre- and post-tests to the subjects. Each pair of tests were color coded to ensure anonymity. Once the pretests were completed, the supervisor instructed the subjects to turn the tests over so they were facedown. The researcher then arrived to give an education session on gluten-free diets and the importance of proper handling procedures for gluten-free meal preparation. After the education process was completed, the researcher thanked the subjects for participating and asked them to take the post-test, before leaving the room. After the exam was completed, the subjects again turned the tests facedown and returned them to the supervisor. After the post-tests were turned in, subjects were free to go back to work or leave for the day depending on their schedule. The supervisor then returned the color-coded tests to researcher when they were completed.

The subjects' normal activities were altered to participate in this study because their scheduled break time was taken up with the study for one day. As compensation for missing their break time while participating in the study, the subjects were provided refreshments during the session.

Data Analysis

Once the tests were completed, the pre- and post-tests were scored and compared to measure the change in knowledge of the subjects. This was measured by

scoring the tests with the matching codes and comparing the change in scores from pre to post after the education session was implemented. Higher scores showed that the cooks have a better understanding of gluten-free diets. Because this is a small study, the individual change in scores measured the change in knowledge from pre to post-test. The difference in pre- and post-test mean scores was also calculated.

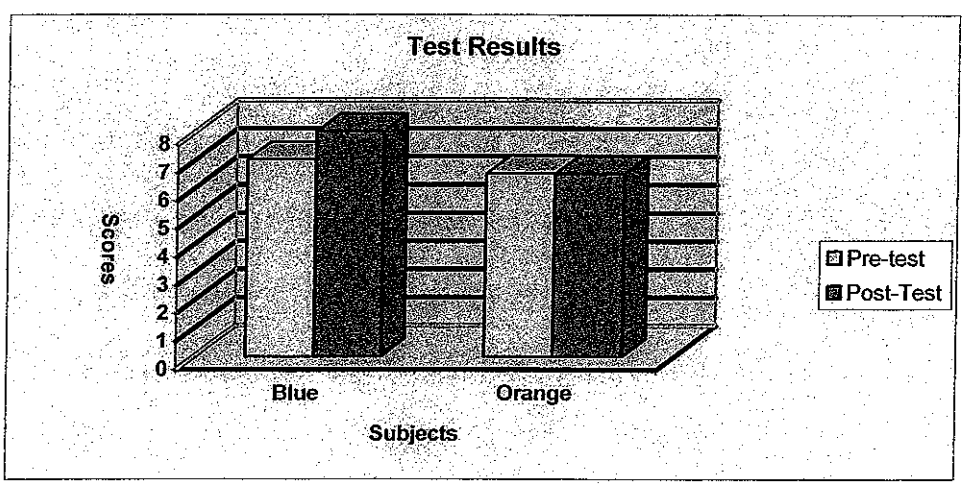
Chapter 4

Results

The pre and post-tests had a total of 8 points each. There were only two subjects in this study, so small reductions in points on the tests resulted in skewing the scores more drastically than if there had been more subjects. The pretest mean score was 6.75 points, with scores ranging from 6.5 to 7.0 correct. The percentages ranged from 80-88 percent correct on the pretest.

The post-test mean score was 7.25, with scores ranging from 6.5 to 8.0. Subject Orange had no change in scores between the pre and post-test, while Subject Blue had a 1 point improvement after the educational intervention. The percentages ranged from 80-100 percent correct on the post-tests. The base score represents zero change from Subject Orange, while the additional 12 percent jump is from Subject Blue's improvement. Please see Table 1.1 below for graphical representation of results.

Table 1.1



Chapter 5

Discussion

Interpretation

The hypothesis of this study was that after participating in the study and receiving education regarding gluten-free diets, the foodservice workers at St. Joseph's University would be able to demonstrate an increased knowledge of gluten-free diets and their safe preparation. Only two subjects completed the study, Blue and Orange for purposes of identity. Blue showed improvement after the intervention and Orange did not show any improvement post-intervention. The small number of subjects precluded an accurate assessment of whether the intervention was effective in increasing the knowledge base of gluten-free diet preparation.

The mean score for the pre-test was 6.75 out of 8 possible points, or 84 percent correct. The cooks had prepared gluten-free meals on campus for the entire school year, so they had prior knowledge of how to prepare gluten-free meals before the study began. While Orange's score remained at 6.5, or 80 percent, on both the pre and post-test, Blue increased from 7.0 to 8.0 on the pre and post-tests respectively, improving his/her score from 88 percent to100 percent.

The results of the study show that providing education can increase knowledge of specialized diets, such as gluten-free in this case, if the subject(s) are open to the learning process.

Strengths and Limitations

This study had multiple limitations from the start. The very small number of participants was a limiting factor in this study. More subjects would have allowed the

beforehand and tried their best to perform on the study, which could be seen as either a limitation or strength of the study.

While there were many limitations in this study, there were a few strengths as well. By color-coding the tests, anonymity was ensured for the two participants when grading the tests. Also, during the education session and following question and answer session, the researcher was able to answer specific questions that the subjects had, whereas if there had been a large group, timing would have limited the amount of questions that would have been able to be answered.

Applications to Practice

It is the belief of the researcher that if the study had been conducted when authorization was granted, many of the complications that occurred could have been avoided. The delay allowed all the unforeseen instances to complicate the study. In addition, performing the study multiple times would allow for more subjects to participate in the study, leading to increased knowledge of gluten-free diets among more than just two cooks on staff.

By having foodservice workers participate in a study similar to this one, there is potential for increased job pride and understanding of why it is important to prepare specialized meals carefully. The students at St. Joseph's University, or another other college campus, who require gluten-free diets would benefit directly because of the increased accuracy in preparing their gluten-free meals by the foodservice staff who received some form of training. Just as any hospital would provide in-services to their foodservice staff about specialized diets, so should any facility where specialized diets are prepared, such as a college campus setting.

Future Research

For future research, a larger more heterogeneous population should be used to educate as many people as possible on gluten-free diets and their proper preparation. It would be beneficial if many members of the foodservice staff could receive education on specialized diets to ensure there is no cross-contamination at any level of service in a cafeteria setting. Barring obstacles, it is the belief of the researcher that this study could be conducted at any university where gluten-free diets are prepared to decrease cross-contamination risks.

Another factor to consider for future research would be to examine different training techniques to educate those who may not learn best from traditional education methods. Some participants may learn from demonstrative techniques rather than lecture form, and this should be explored for future studies.

References

Almanza, B.A., Nesmith, M.S. (2004). *Food Safety Certification Regulations in the United States.* Journal of Environmental Health. Vol. 66, no. 9, p.10-14.

Celiac Sprue Association. (2005). *Gluten-Free Diet: Basic diet choices.* http://www.csaceliacs.org/gluten_choices.php.

Center for Diease Control and Prevention. (2000). *CDC data provides the most complete estimate on foodborne disease in the United States.* http://www.cdc.gov/od/media/pressrel/r990917.htm.

Ciclitira, P.J. (2001). *AGA Technical Review on Celiac Sprue.* The American Gastroenterological Association. vol 120, no. 6, p.1526-1540.

Cohn, S. (2006). *Food Education Allergy Support Team: School allergy information.* Seattle Food Allergy Association. http://www.seattlefoodallergy.org.

Escott-Stump, S. (2002). *Celiac Disease.* Nutrition and Diagnosis-Related Care, 5th Edition. Lippincott Wilkins. Baltimore, MD.

Food and Drug Adminstration & Food Safety & Inspection Service. (2002). *Food safety. Healthy People 2010.* http://www.healthypeople.gov/document/html/volume1/10food.htm.

Food and Drug Administration & US Public Health Service. (2005). 2005 Food Code. http://www.cfsan.fda.gov/~dms/fc05-toc.html.

Green, P., Bana, J. (Aug 2003). *Coeliac Disease Seminar.* The Lancet, vol. 362, p. 383-391.

Harvard Women's Health Watch. (May 2001). *Celiac disease and how to live with it.* Gastrointestinal Problems. p. 3-4.

Health and Human Services. (2005). *United States Dietary Guidelines 2005.* Washington DC: Government Printing Office.

Indorato, D. (Aug 2005). *What foodservice staff should know about food allergies.* Today's Dietitian. Vol. 7, no. 8, p. 38.

Jackson Enterology (2005). Patient Education: Gluten-Free Diet. http://www.gicare.com/pated/edtgs06.htm.

Luchtenfeld. W., Burton, M.S., Donovan, P. (Jul 2003). *Clinical Case Report: The importance of a gluten-free diet.* The Nurse Practitioner. p. 47-49.

Manning, C.K. (1994, Aug). *Food safety knowledge and attitudes of workers from institutional and temporary foodservice operations.* Journal of the American Dietietic Association. vol. 94, no. 8, p. 895-897.

Merriam-Webster. (2006). *Allergy Definition.* http://www.merriamwebster.com.

Peraaho, M., et. al. (2004). *Oats can diversify a gluten-free diets in celiac disease and dermatitis herpetiformis.* Journal of the American Dietetic Association. Vol. 104, no 7, p. 1148-1150.

Schoenhals, K. (May 2005). *Friendly fire: Gluten intolerance is surprisingly hard to identify.* Better Nutrition. p. 34-35.

Thompson, T. (2000, Apr). *Questionable foods and the gluten-free diet: Survey of current recommendations.* Journal of the American Dietetic Association. Vol. 100, no. 4, p. 463-465.

Appendix A

Approval Letter

(Please see following page for Authorization Letter)

SAINT JOSEPH'S UNIVERSITY

DIRECTOR OF PUBLIC SAFETY AND AUXILIARY SERVICES

FOUNDED 1851

September 15, 2005

Immaculata University
Research Ethics Review Board
1145 King Road
Immaculata, PA 19345

To: Research Ethics Review Board

Re: Lisa Pleasants thesis project

Please accept this letter authorizing Lisa Pleasants to conduct research here at Saint Joseph's University as part of her thesis project at Immaculata University. It is understood that the research will consist of educating the food service workers on gluten-free diets to ensure that students served gluten-free meals will receive quality meals free of potentially dangerous allergens. Additionally, it is realized that this research is for Immaculata University's thesis program as part of Lisa's educational program.

I am pleased to assist with Lisa's endeavor and support her with this project.

Sincerely,

Albert B. Hall
Director of Public Safety &
Auxiliary Services

Cc: L. Pleasants

Appendix B

IMMACULATA UNIVERSITY RESEARCH ETHICS REVIEW BOARD
REQUEST FOR PROTOCOL REVIEW--GENERAL CONSENT FORM OUTLINE
(R1297)

VERBAL CONSENT SCRIPT

I am studying Gluten-Free meal preparation and education for safe food preparation techniques as part of the requirements of my graduate studies at Immaculata University. To help me gain further insights into this area, I will ask you to take a short pre- and post-test about gluten-free diets and how to prepare them on campus. In addition, you will be asked to participate in a short information session to provide you with education on gluten-free diets to aid understanding of what a gluten-free diet is and proper preparation techniques when preparing meals. This will be held during your break period on May 18, 2006.

The data you will provide will be recorded anonymously and your feedback during the session will be held in the strictest confidence. The tests will be coded with colors so your identity will not be known in the results of the study.

I welcome questions about the study at any time. Your participation in this study is on a voluntary basis, and you may refuse to participate at any time without consequence or prejudice. Any questions you have about the research can be directed to me, Lisa Pleasants at 215-707-0626 or via email at lisapl@verizon.net. In addition, you can contact my professor, Dr. Laura Frank, Chair of Nutrition Education at Immaculata University, 610-647-4400 x 3482, or via email at lfrank@immaculata.edu.

Any questions about your rights as a research subject may be directed to Dr. Christine Charnitski, Chair IU-RERB, Immaculata University, Immaculata, PA 19345, phone 610-647-4400 x3286, or via email at ccharnitski@immaculata.edu.

Appendix C

Pre- and Post-Test

Gluten-Free Diet Pre- and Post-Test
Immaculata University Thesis Project
St. Joseph's University

1. What is gluten? (1pt)
    a. Protein found in grain foods
    b. Something used in arts and crafts
    c. Protein found in meat products

2. Gluten can be found in? (1pt)
    a. Wheat
    b. Rye
    c. Barley
    d. Oats
    e. All of the above

3. Gluten-Free meals are being offered on campus at St. Joe's. When these meals are prepared, they should be... (1pt)
    a. Prepared the same as any other meal
    b. Prepared in a separate area of the kitchen where contamination is minimal
    c. Mixed in with other meals and served

4. True or False. (Please circle) It is okay to use the same gloves when preparing food for the hot meal and then making the gluten-free meal. (1pt)

5. You are running behind on preparing the meals for the evening. A temp cook is available to help get the gluten-free meal ready for the evening, although he is unfamiliar with gluten-free diets. What is the best way to explain preparing the meals to them? (1pt)
    a. Make sure that only the items in the recipe are included in the meal
    b. Use separate gloves when preparing the meals
    c. Show them where the gluten-free food is located in the dry storage and freezer
    d. All of the above

6. Please explain briefly how to prepare a gluten-free meal. (3pts)

_____
_____
_____
_____

Appendix D

Lesson Plan

I. Objective

- At the end of the study, the participants are expected to attain increased knowledge of gluten-free diets, leading to increased skills in preparing specialized meals without putting students at risk for cross-contamination.

II. Content

- The education session will include a discussion of gluten-free diets, with handouts of written materials on gluten-free diets and safe preparation techniques of specialized diets to ensure no risk of cross-contamination with gluten-free containing foods.
- There will be a question and answer portion of the education session where the subjects could ask questions about gluten-free diets and how to safely prepare the food in the kitchen setting.

III. Materials

- The education materials were provided by the Jackson Enterology Group of Camp Hill, PA in May 2006. The materials are provided as education materials for patients who have Celiac Disease and require specialized diet instructions.

IV. Procedure

- To conduct the study, the researcher will gather the cooks during a scheduled break to take a pretest on gluten-free diets, including what gluten is, what

foods contain gluten and the proper techniques to avoid dangerous cross contamination with gluten-containing foods during preparation.

- Following the pre-test, there will be an education session where the subjects listen to a lecture on gluten-free diets, receive written materials for reference and educational purposes and participate in a question and answer session.
- In order to assure anonymity, the researcher will enlist the aid of a supervisor to administer the pre- and post-tests to the subjects. Each pair of tests are color coded to ensure anonymity. Once the pretests are completed, the supervisor will instruct the subjects to turn the tests over so other subjects or the supervisor cannot see them.
- The researcher will give an education session on gluten-free diets and the importance of proper handling procedures for gluten-free meal preparation.
- After the education process is completed, the researcher will ask the subjects to take the post-test, before leaving the room.
- After the exam was completed, the subjects will return the tests to the supervisor, who will turn them into the researcher.

V. Evaluation

- The stated objectives will be measured by an increase in scores from the pre to post-test. An improvement in scores will show that the objective of increasing knowledge of gluten-free diets and their proper preparation were met through the study.

Appendix E

Educational Materials

(Please see attached Educational Materials)

Gluten-Free Diet Information

SJU Intervention

Lisa Pleasants

Gluten-Free Diet

Purpose

Gluten is the protein part of wheat, rye, barley, and other related grains. Some people cannot tolerate gluten when it comes in contact with the small intestine. This condition is known as celiac disease.

In patients with celiac disease, gluten injures the lining of the small intestine. This injury results in weight loss, bloating, diarrhea, gas, abdominal cramps, or vitamin and mineral deficiencies. When patients totally eliminate gluten from the diet, the lining of the intestine has a chance to heal.

Removing gluten from the diet is not easy. Grains are used in the preparation of many foods. It is often hard to tell by an ingredient's name what may be in it, so it is easy to eat gluten without even knowing it. However, staying on a strict gluten-free diet can dramatically improve the patient's condition. Since it is necessary to remain on the gluten-free diet throughout life, it will be helpful to review it with a registered dietitian.

Oats is a grain the merits special attention. Oats are believed safe in patients with celiac disease although this was not always the case. The problem with oat products is not the grain but rather the manufacturing process. When oats are processed in the same facilities as wheat, contamination can occur even with the best cleaning protocol. Oat products can now be found that are not cross contaminated. These can be tried after an initial period of 6 months to see if they can be tolerated. Most, but not all patients can tolerate pure oat products.

Special Considerations

The person who prepares the patient's food must fully understand the gluten-free diet. Read food labels carefully.

- **Do not eat** anything that contains the following grains: wheat, rye, and barley.
- The following **can be eaten** in any amount: corn, potato, rice, soybeans, tapioca, arrowroot, carob, buckwheat, millet, amaranth and quinoa.
- **Distilled white vinegar** does not contain gluten.
- **Malt vinegar** does contain gluten.

Grains are used in the processing of many ingredients, so it will be necessary to seek out hidden gluten. The following terms found in food labels may mean that there is gluten in the product.

- **Hydrolyzed Vegetable Protein (HVP)**, unless made from soy or corn
- **Flour** or **Cereal** products, unless made with pure rice flour, corn flour, potato flour, or soy flour
- **Vegetable Protein** unless made from soy or corn
- **Malt or Malt Flavoring** unless derived from corn
- **Modified Starch** or **Modified Food Starch** unless arrowroot, corn, potato, tapioca, waxy maize, or maize is used
- **Vegetable Gum** unless vegetable gums are carob bean gum, locust bean gum, cellulose gum, guar gum, gum arabic, gum aracia, gum tragacanth, xanthan gum, or vegetable starch
- **Soy Sauce** or **Soy Sauce Solids** unless you know they do not contain wheat

Any of the following words on food labels usually means that a grain containing gluten has been used

- **stabilizer**
- **starch**
- **flavoring**
- **emulsifier**
- **hydrolyzed plant protein**

Food Group	Do Not Contain Gluten	May Contain Gluten	Contain Gluten
Milk & milk products (2 or more cups daily)	whole, low fat, skim, dry, evaporated, or condensed milk; buttermilk; cream; whipping cream; Velveeta cheese food; American cheese; all aged cheeses, such as Cheddar, Swiss, Edam, and Parmesan	sour cream commercial chocolate milk and drinks, non-dairy creamers, all other cheese products, yogurt	malted drinks
Meat or meat substitutes (5 to 6 oz daily)	100% meat (no grain additives); seafood; poultry (breaded with pure cornmeal, potato flour, or rice flour); peanut butter; eggs; dried beans or peas; pork	meat patties; canned meat; sausages; cold cuts; bologna; hot dogs; stew; hamburger; chili; commercial omelets, soufflés, fondue; soy protein meat substitutes	croquettes, fish, chicken loaves made with bread or bread crumbs, breaded or floured meats, meatloaf, meatballs, pizza, ravioli, any meat or meat substitute, rye, barley, oats, gluten stabilizers
Breads & grains (4 or more servings daily)	cream of rice; cornmeal; hominy; rice; wild rice; gluten-free noodles; rice wafers; pure corn tortillas; specially prepared breads made with corn, rice, potato, soybean, tapioca arrowroot ,carob, buckwheat, millet, amaranth and quinoa flour; puffed rice	packaged rice mixes, cornbread, ready-to-eat cereals containing malt flavoring	breads, buns, rolls, biscuits, muffins, crackers, and cereals containing wheat, wheat germ, oats, barley, rye, bran, graham flour, malt; kasha; bulgur; Melba toast; matzo; bread crumbs; pastry; pizza dough; regular noodles, spaghetti, macaroni, and other pasta; rusks; dumplings; zwieback; pretzels; prepared mixes for waffles and pancakes; bread stuffing or filling
Fats & oils (servings depend on caloric needs)	butter,margarine, vegetable oil, shortening, lard	salad dressings, non-dairy creamers, mayonnaise	gravy and cream sauces thickened with flour

Fruits (2 or more servings daily)	plain, fresh, frozen, canned, or dried fruit; all fruit juices	pie fillings, thickened or prepared fruit, fruit fillings	none
Vegetables (3 or more servings daily)	fresh, frozen, or canned vegetables; white and sweet potatoes; yams	vegetables with sauces, commercially prepared vegetables and salads, canned baked beans, pickles, marinated vegetables, commercially seasoned vegetables	creamed or breaded vegetables; those prepared with wheat, rye, oats, barley, or gluten stabilizers
Snacks & desserts (servings depend on caloric needs)	brown and white sugar, rennet, fruit whips, gelatin, jelly, jam, honey, molasses, pure cocoa, fruit ice, popcorn, carob	custards, puddings, ice cream, ices, sherbet, pie fillings, candies, chocolate, chewing gum, cocoa, potato chips	cakes, cookies, doughnuts, pastries, dumplings, ice cream cones, pies, prepared cake and cookie mixes, pretzels, bread pudding
Beverages (4 to 6 cups or more daily)	tea, carbonated beverages (except root beer), fruit juices, mineral and carbonated waters, wines, instant or ground coffee	cocoa mixes, root beer, chocolate drinks, nutritional supplements, beverage mixes	Postum™, Ovaltine™, malt-containing drinks, cocomalt, beer, ale, gin, whiskey, rye
Soups	those made with allowed ingredients	commercially prepared soups, broths, soup mixes, bouillon cubes	soups thickened with wheat flour or gluten-containing grains; soup containing barley, pasta, or noodles
Thickening agents	gelatin, arrowroot starch; corn flour, germ, or bran; potato flour; potato starch flour; rice bran and flour; rice polish; soy flour; tapioca, sago		wheat starch; all flours containing wheat, oats, rye, malt, barley, or graham flour; all-purpose flour; white flour; wheat flour; bran; cracker meal; durham flour; wheat germ
Condiments	glutent-free soy sauce, distilled white vinegar, olives, pickles,	flavoring syrups (for pancakes or ice cream), mayonnaise,	

	relish, ketchup	horseradish, salad dressings, tomato sauces, meat sauce, mustard, taco sauce, soy sauce, chip dips	
Seasonings	salt, pepper, herbs, flavored extracts, food coloring, cloves, ginger, nutmeg, cinnamon, bicarbonate of soda, baking powder, cream of tartar, monosodium glutamate	curry powder, seasoning mixes, meat extracts	synthetic pepper, brewer's yeast (unless prepared with a sugar molasses base), yeast extract (contains barley)
Prescription products		all medicines: check with pharmacist or pharmaceutical company	

Sample Menu

Breakfast	Lunch	Dinner
• cream of rice *1/2 cup* • skim milk *1 cup* • banana *1 med* • orange juice *1/2 cup* • sugar *1 tsp*	• baked chicken *3 oz* • rice *1/2 cup* • green beans *1/2 cup* • apple juice *1/2 cup* • ice cream (made with-out wheat stabilizers) *1/2 cup*	• sirloin steak *3 oz* • baked potato *1 med* • peas *1/2 cup* • fruited gelatin *1/2 cup* • butter *1 Tbsp* • tea *1 cup* • sugar *1 tsp*