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Effectiveness of Food-demos to Increase Nutrition Knowledge

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EFFECTIVENESS OF FOOD-DEMOS TO
INCREASE NUTRITION KNOWLEDGE

MEGAN HEMMELGARN

HONORS PROJECT

Submitted to the Honors College
at Bowling Green State University in partial
fulfillment of the requirements for graduation with

UNIVERSITY HONORS

DECEMBER 11, 2015

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Department of Public and Allied Health
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INTRODUCTION

Inadequate nutrition in the United States has become an increasing concern in recent years due to high rates of disease and obesity. Particularly, the nutrition status of college-aged students is of concern because a poor diet early in life is highly correlated to poor health in later years (1). The Dietary Guidelines for Americans (DGA) provide evidence-based nutrition advice for humans to follow in order to maintain an adequate and healthful diet. According to Anding et al, only 43 percent of college-aged females follow two of the seven DGA (2). This means that over half of college-aged females follow one or none of the evidence-based nutrition recommendations set forth to provide guidance for selecting a beneficial diet. More specifically, 65.4% of college-aged students reported that they consume less than the recommended five servings of fruits and vegetables daily (3). These reports indicating poor nutrition habits among college-aged Americans is of great concern because of the consequences related to inadequate nutrition.

Potassium, calcium, vitamin D, and dietary fiber are among the top vitamins and nutrients that are inadequate in the average American's diet (4). These inadequacies can lead to serious health issues. Malnourishment has a strong relationship with comorbidity and high health care costs (5). Poor and inadequate nutrition can also be passed down through generations because the nutrition of the mother has a large impact on the nutrition of her offspring (6). In order to improve the health of college-aged Americans, effective education must be provided to successfully influence and change their behavior.

The rise and popularity of technology provides constant distractions, instant information, and never-ending entertainment. Because the latest generation has grown up with technology, their minds function differently than that of previous generations (7). This is raising concern that previous education methods are no longer effective in teaching the youth (7). One research study delivered a series of nutrition education classes to college-aged students using a different education method for each class. According to the student surveys, the food-demonstration method was rated most effective with the highest score of a 3.81 on a 4 point scale (8). Another study promoting new recipes included taste-testing within the education. The surveys showed that 75.9% of the participants indicated that they would make the recipe at home after tasting the recipe (9). Nutrition programs for WIC families have also included food-demos and taste-testing as part of their education series. This resulted in a 0.25 increase of daily servings of fruits and vegetables one year after the education (10). These nutrition education studies have assessed aspects of food-demos and taste testing, but to our knowledge, there has been no previous study evaluating the effectiveness of a one-time food-demo to increase the vegetable and dairy consumption of college-aged females. We have developed a presentation to evaluate if a one-time food-demo is effective in educating college-aged students and changing their behavior regarding vegetable and dairy consumption.

METHODS

Planning, Recruiting, and Pilot Testing Interventions

The target audience of this study was college-aged females living in residence halls. For participant convenience, the location of the presentations were set in a residence hall on Bowling

Green State University's (BGSU) campus. The residence hall director was contacted for approval of the programing. Flyers (Appendix A) were placed in the residence hall advertising the program. Resident advisors were asked to encourage their residences to participate in the program, and an advertisement was sent out via Campus Updates (Appendix B) for recruitment. Recruiting also took place by advertising to large classes on campus.

The survey used in this research project was pilot tested to assess test-retest reliability. The pilot survey (14 questions) was distributed once via Qualtrics, and participants of the first survey were asked to take the survey again two weeks later. Surveys were tracked using the last four digits of respondent's cell phone number. The first round of testing resulted in 43 responses, 32 of which completed the entire survey. The second round of distribution resulted in 19 responses and 17 completed surveys. Of these responses, 15 surveys were completed in full in both the first and second round of survey distribution. These are the surveys that were evaluated. For the personal questions regarding vegetable and dairy consumption, we aimed for a correlation higher than 0.7 ($R > 0.7$). The five personal questions all contained $R > 0.7$ with an average of $R = 0.827$.

For the knowledge-based questions (6 questions), we evaluated the responses to see if the answers were commonly known before any education. We also evaluated the correlation of responses to see if people changed their response two weeks later. Because of the low correlation values (average $R = 0.479$) of all knowledge based questions, we could see that the questions were not common knowledge and would be effective in evaluating if participants gained any knowledge after education. For the two short answer questions asking about barriers students face in consuming adequate nutrition, the responses were read to make sure they made sense, and to evaluate if the questions were interpreted correctly.

Design of the Program

The program was designed for college-aged females living in a residence hall. For this reason, the presentations were scheduled in the conference room of a residence hall (Harshman Quadrangle) on campus to provide a convenient location for the target audience. The presentation was delivered three times. Eligibility criteria required that participants had to be female, 18 years of age or older, living in a residence hall, and have no known dairy or wheat allergies.

The program design was focused on interactive engagement of participants, steering away from traditional, lecture-based learning techniques. The focus of the presentation was on "residence hall-friendly" recipes that include vegetables and dairy products. The importance of dairy and vegetables were discussed focusing on specific vitamins and minerals including calcium, vitamin D, potassium, and fiber. The importance of these vitamins and nutrients as well as consequences of inadequate consumption was delivered to the audience.

The presentation began with an introduction of the nutrients utilizing an interactive nutrient game (Appendix C). After the education, participants were given the recipe handouts, and they participated in a food-demo showing how to make three of the four recipes. They were then encouraged to taste-test a sample of the three recipes demonstrated.

Visuals and Printed Materials

All participants were asked to read and sign an informed consent form (Appendix D) indicating that they understood the study requirements, met the requirements, and agreed to participate in the research. They were then asked to fill out a pre-test (Appendix E) on paper containing 10 demographic questions followed with 13 nutrition-related questions. A post-test (Appendix F) was distributed on paper immediately after the presentation which consisted of 2 demographic questions, 13 nutrition related questions similar to the questions asked in the initial survey, and 3 questions critiquing the presentation. Approximately one-month after the presentation, a post 2-test (Appendix G) was distributed online to the participants containing 2 demographic questions and 13 nutrition related questions similar to the ones asked in the first 2 surveys, and one additional question to see if any of the recipes were made at home.

During the presentation, each participant received a handout listing 4 residence hall-friendly recipes (Appendix H). Each recipe included a title, yield, prep time, total time, ingredients, directions, and additional notes/tips. A poster board (Appendix C) was used during the presentation to assist in the nutrition education and game. The board was not set up until after the pre-test was turned in and was taken down before the post-test was taken. The 4 vitamins/nutrients of interest were listed on the left side of the board, 8 food examples were placed in the middle, and the right side of the board listed the 4 recipes that were discussed during the presentation.

Nutrition Education

Presenting the vitamin and mineral information was done with the aid of an interactive poster board. Participants were divided into small groups, and each group was given a colored piece of paper corresponding to a particular nutrient/vitamin with Velcro on the back. After the first vitamin/mineral was introduced and briefly explained, participants were asked to discuss which food on the board was a good source of that particular nutrient/vitamin. When they decided on a food choice, the group with the color-coded nutrient was asked to come up to the presentation board and attach their square to the correct food. The rest of the audience was then asked if they agreed or disagreed. A small discussion then took place explaining why that particular food was correct or incorrect for the given nutrient. Each nutrient was represented by 2 colored squares that matched up with 2 food choices on the board for a total of 8 items on the presentation board. More examples of food options were provided verbally in the discussion.

Food-demo

After the initial nutrient introduction and game, the recipe handouts were distributed to the participants, so they could follow along during the food-demos. The first food-demo was the Tomato Cucumber Snack recipe. The recipe was demonstrated step-by-step following the directions and ingredients on the handout. After the demonstration, the pre-made snacks were distributed to the participants to allow them to taste the final product.

The next recipe, Greek Yogurt Dip, was demonstrated according to the recipe, and samples of the dip were passed out along with carrots and celery to allow the audience to try the final recipe.

Lastly, Frozen Yogurt Bars were demonstrated according the recipe directions, and pre-made samples were passed out for taste-testing following the demonstration.

Each of the recipes included possible alterations, and helpful hints that were verbally explained and addressed during the demonstrations. This allows for the audience to adjust the recipe if they do not like a particular ingredient, alter the recipe if they have allergies or intolerances, or enhance the recipe to fit their taste preferences. The flexibility and ease of the recipes allow them to be appropriate for each participant.

Evaluation

Evaluation of the final results was executed via Qualtrics and SPSS version 22. Changes in responses from participants were tracked between the 3 surveys, and trends were observed from the qualitative data. We assessed changes in knowledge and/or behavior among the 3 surveys.

Questions 1-5 were multiple choice questions regarding the participant's behavior and consumption of vegetable and dairy products. Questions 6-9 were multiple choice questions and 10-11 were short answer questions all asking knowledge based questions regarding the 2 food groups and 4 nutrients discussed in the presentation. All 3 surveys ended with 2 short answer questions regarding consumption behavior.

In addition to the questions listed above, the post-test contained 3 Likert scale questions relating to the presentation. The post 2-test (distributed one-month after intervention) contained one additional question regarding the presentation.

When assessing multiple choice questions, averages, frequencies, and differences were evaluated. The short answer responses were grouped together into different themes to evaluate trends, similarities, and differences from the three surveys. The data were also placed into graphs and tables for easy visual representation of the results.

Statistical Analysis

Data was analyzed using SPSS version 22. Data is presented as means \pm standard deviation. To assess change in knowledge over time, we first conducted Cochran's Q test to determine if there were significant differences between the three time points (pre-test, post-test, and post-test 2, which occurred 1 month after the food-demo). We did post hoc comparisons using McNemar's test. Friedman's test was used to evaluate significant data for behavior change questions. P values < 0.05 were considered significant.

RESULTS

Population

Twenty-six participants attended the food-demo and completed the pre- and post-test. Twenty participants completed post-test 2 one-month after the food-demo. The average age of participants was 18.9 ± 0.7 years old. Class standing of participants, as seen in Figure 1, ranged from freshman to junior with 57.7% freshman, 38.5% sophomore, and 3.8% junior.

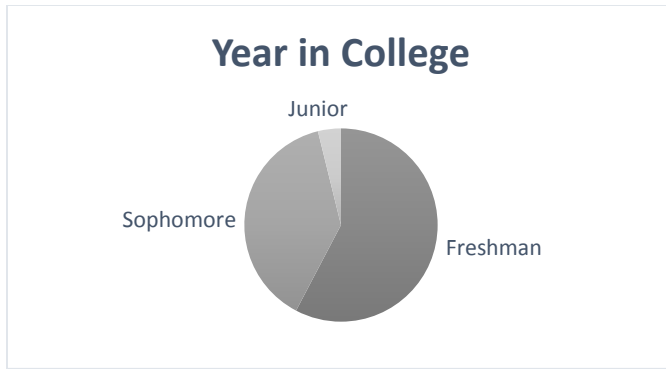


Figure 1: Grade level of participants displayed as percentages (n = 26).

The majority (96.2%) of participants characterized their race as white, none of the participants identified as Hispanic or Latino. Of the initial 26 participants, 5 participants indicated being on a special diet including lactose-free, gluten-free, vegetarian, and nut-free diets. The majority of participants consume 2% milk, full-fat cheese, and low-fat yogurt (57.7%, 50.0%, and 57.7%), respectively (Figure 2).

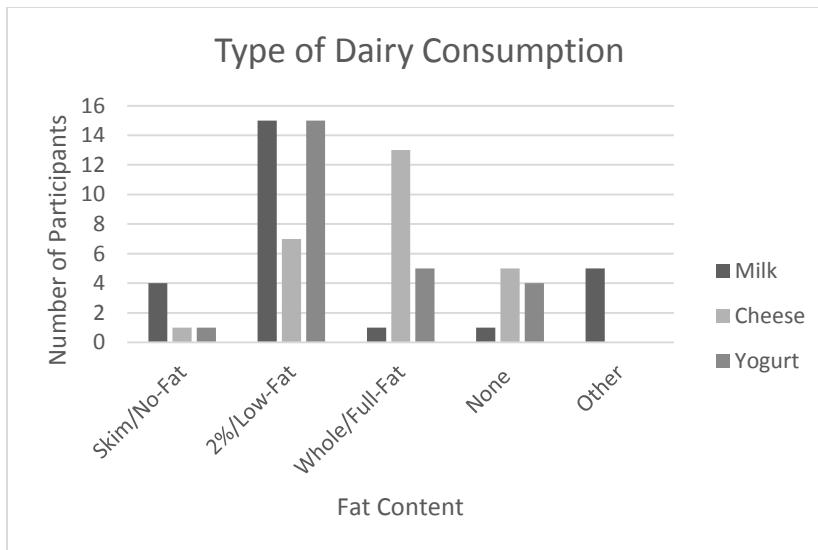


Figure 2: Fat content in the type of milk, cheese, and yogurt consumed by participants. Each bar represents the number of participants who indicated that they consume that particular type of dairy (n = 26).

Data provided self-reported daily servings of vegetable and dairy consumed by participants (Figure 3). The majority of participants (65.4% and 38.5%) consume 1-2 servings of both vegetables and dairy, respectively.

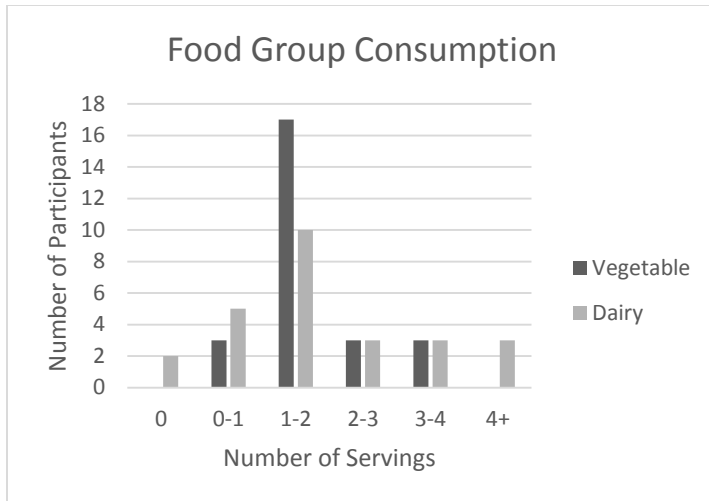


Figure 3: Self-reported servings of vegetables and dairy consumed by participants. The height of the bars represent the number of participants who selected that answer.

Barriers faced by participants regarding vegetable and dairy consumption were categorized into themes (Figure 4). The most common barrier experienced regarding vegetable consumption was related to living on campus and not liking the vegetable options offered in the dining halls (57.7%).

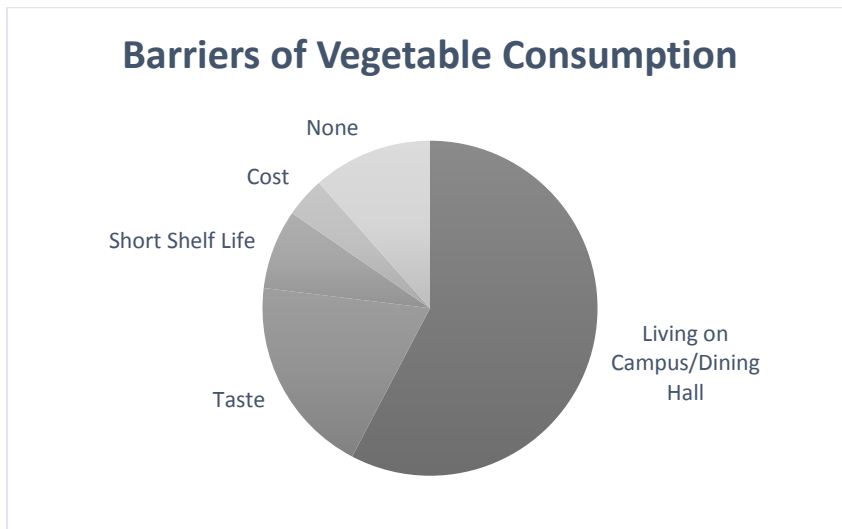


Figure 4: Common responses of the types of barriers participants face regarding adequate vegetable consumption.

The barriers experienced regarding dairy consumption varied greatly (Figure 5). The most common response (26.9%) was that no barriers were experienced regarding dairy consumption. Some barriers other participants reported include living on campus and eating in dining halls, disliking the taste, and experiencing discomfort from the lactose.

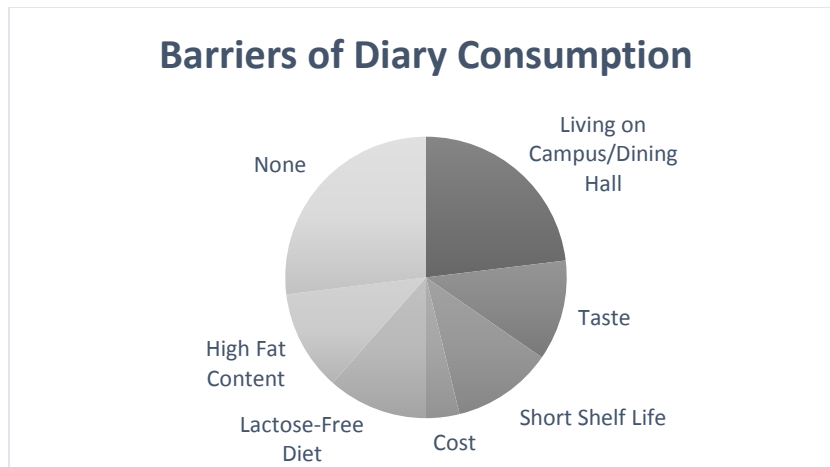


Figure 5: Common responses of the types of barriers participants face regarding adequate dairy consumption.

Knowledge Based Results

When asked about the correct number of vegetable servings for college-aged women, the number of participants answering correctly increased significantly between pre- and post-testing ($p < 0.001$). These knowledge gains were lost between post-testing and the 1-month follow-up period, resulting in no difference between the pre-test and the 1-month follow-up ($p > 0.05$). In contrast, knowledge about the correct servings of dairy significantly increased between the pre- and post-test ($p < 0.001$) and did not differ between post-test and post-test 2 ($p > 0.05$). A significant improvement was seen between pre- and post-test 2 ($p = 0.002$), suggesting the knowledge was retained until the time of the post-test 2.

Knowledge questions about which food contained the highest amount of calcium, potassium, vitamin D, and fiber were evaluated using the same method as above. When asked about calcium, the number of participants answering correctly increased significantly between pre- and post-testing ($p < 0.001$) and between pre- and post-testing 2 ($p = 0.002$) indicating that knowledge was gained and retained until the time of the 1-month follow-up. The question about potassium showed a significant increase in knowledge ($p < 0.001$) between the pre- and post-test. A trend was indicated between the pre- and post-test 2 ($p = 0.065$) indicating that there was significant knowledge gain initially, but only slight knowledge gain from the time of pre-test until the 1-month follow-up. No significant change ($p > 0.05$) was indicated between the post- and post-test 2 demonstrating that knowledge was retained from the time of the post-test to the time of the post-test 2. Significant increase in knowledge was observed from the pre- to post-test ($p < 0.001$), pre- to post-test 2 ($p = 0.002$), and post- to post-test 2 ($p = 0.004$) regarding the vitamin D question. This indicates that overall, knowledge was gained, but a slight decline in knowledge was experienced between the post- and post-test 2. The question regarding fiber also indicated a significant increase in knowledge from the pre- to post-test ($p < 0.001$) and pre- to post-test 2 ($p = 0.008$) representing an overall gain in knowledge. The significant difference from the post- to post-test 2 ($p = 0.002$) indicates a decline in the retention of the knowledge from the time immediately after intervention to the 1-month follow-up.

Table 1: Number of correct answers to knowledge-based questions on each of the three surveys distributed over the course of this study.

Knowledge Based Questions			
	# Correct Pre-test	# Correct Post-test	# Correct Post-test 2
Recommended Vegetable Servings	3	26*	8 ^o
Recommended Dairy Servings	7	26*	16 ⁺
Food Containing Calcium	13	26*	18 ⁺
Food Containing Potassium	12	24*	16
Food Containing Vitamin D	0	23*	10 ^{+o}
Food Containing Fiber	5	26*	10 ^{+o}

Number of total responses: pre-test and post-test = 26; post-test 2 = 20.

* = $p < 0.05$ between pre-test and post-test

+ = $p < 0.05$ between pre-test and post-test 2

^o = $p < 0.05$ between post-test and post-test 2

Behavior Based Questions

No significant differences in vegetable or dairy consumption ($p > 0.05$) were detected among the 3 time periods of the survey distributions for either food groups. This indicates that no changes in vegetable and dairy consumption were experienced between the time of the intervention and one-month later. Half of the participants who answered the question indicated that they had made at least one of the recipes demonstrated.

DISCUSSION

After evaluating the data, our results suggest that a one-time food-demo was, for the most part, a successful education intervention. When asking about the correct daily servings of dairy products, participants gained knowledge and retained the knowledge throughout the course of intervention. Participants also gained knowledge about vegetables immediately after the presentation, however, this gain of knowledge was not retained until the time of the 1-month survey. While the number of servings of vegetables is frequently discussed in health classes or by the media, we would think that this information would be easier to retain than the information about the best source of a particular nutrient. However, these findings could be due to the fact that the participants were not given multiple choice options. If the questions would have been multiple choice, the participants may have been able to recall the facts better than they did when having to come up with the answer themselves.

There was a high frequency of correct answers on the knowledge based questions immediately after the presentation. These positive results of knowledge gain could be due to multiple factors. One factor could be a result of the food-demo intervention that captured and retained the

attention of the participants which led to the gain of knowledge. Another factor leading to immediate gain of knowledge could be due to the concise content of the presentation. The design of the presentation was to provide the participants with important knowledge but avoiding extra information that was not relevant to the overall purpose of the presentation. Similar to a study by Kushner, concise nutrition education that is clear and pertinent to the patient has been found to be effective in the healthcare setting (11). A gain in knowledge could have resulted from this education structure, because the participants were not overwhelmed with an abundance of facts.

The lack of behavior change in the participant's eating habits one-month after intervention was not a surprise because behavior change is difficult to achieve. Even though participants gained knowledge after intervention, it was not successful in increasing their consumption of daily vegetable and dairy products. As indicated in Yamamoto's study, having knowledge about the nutrition information in fast food choices did not change what the study participants ordered, showing that knowledge does not necessarily change behavior (12).

Although no behavior change was detected, participants did report making some of the recipes. The most common recipes made were the Tomato Cucumber Snack and Frozen Yogurt Bars. The reason for these results could be related to the fact that all the ingredients to these recipes can be purchased on campus with the required meal-plan money. With this in mind, it can be concluded that education and intervention methods should include suggestions that are appropriate for participants. The easier it is for the participants to incorporate the change in their daily lives, the more likely they will be to implement the changes.

Strengths and Limitations

Strengths of this study include the series of surveys throughout the intervention which allows us to track the success and effect of intervention at different points in time. This also allows us to track knowledge gain and retention as well as behavioral change. Limitations of data collection include the small sample size of only 26 participants and 20 completed follow-up surveys. A convenience sample was also used, evaluating participants from only one University in Northwest Ohio. All participants had similar demographics regarding race and ethnicity which does not provide a good representation of the entire population. More participants and a more diverse sample would be needed to make further and more valid conclusions.

Suggestions for Practice

Although more research will need to be conducted to validate the results from this study, dietitians can still use these findings going forward with nutrition education development. Results from this study show that interactive, concise, one-time education methods are successful at educating participants; however, more education and resources may be needed to encourage retention of the knowledge after the initial intervention.

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Nutrition Education Study Needs You!



Eligibility

- Females
- Age 18 and older
- Currently living in a dorm room

BGSU's Department of Public and Allied Health seeks people to explore the impact of **nutrition education**. A \$20 Amazon.com gift cards will be awarded to 3 participants who complete the study. Contact us to learn more!

For more information, contact Megan Hemmelgarn @ meganmh@bgsu.edu

Nutrition Education Study Email: meganmh@bgsu.edu	Nutrition Education Study Email: meganmh@bgsu.edu	Nutrition Education Study Email: meganmh@bgsu.edu	Nutrition Education Study Email: meganmh@bgsu.edu	Nutrition Education Study Email: meganmh@bgsu.edu	Nutrition Education Study Email: meganmh@bgsu.edu
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Campus Update Text

Did you know that dorm room dining can be delicious and nutritious? We are looking for female BGSU students to participate in a research study designed to determine effective ways to increase nutrition knowledge among college women. You must be 18 years or older, willing and able to consume dairy and wheat products, and live in a residence hall on campus. You will attend a 30 minute presentation and complete short surveys designed to test the effectiveness of the presentation immediately after the survey and again one month later. All participants are eligible to win one of three \$20 Amazon.com gift cards. Contact Megan Hemmelgarn for more details at meganmh@bgsu.edu.

Appendix C



Appendix D

Informed Consent for “Effectiveness of Nutrition Education” Study

Introduction: You are invited to participate in the “Effectiveness of Nutrition Education” study. This project is a collaboration between Megan Hemmelgarn, undergraduate student in the Food and Nutrition Program at Bowling Green State University (BGSU), and Dr. Robin Tucker-Falconer, Assistant Professor of Public and Allied Health at BGSU.

Purpose: The purpose of this study is to explore the effectiveness of a one-time nutrition education presentation on the knowledge and behaviors of college-aged females.

Benefits of being a participant include:

- You will learn about and receive handouts for new “dorm-friendly” recipes to help increase vegetable and dairy intake.
- You will learn the importance of nutrition for the human body.

Benefits to society:

- If we can determine effective ways to deliver nutrition education that improves nutrition behaviors and increases nutrition knowledge, we can share these techniques with future educators to increase the overall health of participants.

Total time commitment (1 hour and 15 minutes):

- 1 visit to attend the presentation
 - 5 minutes to read and sign consent form
 - 15 minute pre-test
 - 25 minute presentation
 - 15 minute post test
- 1 month after initial visit
 - 15 minute post-test will be delivered via email

Procedure:

Pre-Presentation:

- Arrive for presentation in the appropriate residence hall.
- Sign informed consent document.
 - You will read the informed consent document.
 - You will have the opportunity to questions about participating in this study.
 - After all questions have been answered to your satisfaction, you will have the option of:
 - signing the informed consent (meaning that you agree to participate in this study), or
 - refusing to sign the informed consent (deciding not to participate).
- Pre-test surveys will be distributed to collect basic demographic information and background nutrition knowledge prior to the presentation.

Presentation

- You will participate in a 25-minute presentation explaining the importance of vegetables and dairy in your everyday diet. The presentation will discuss risk factors for deficiencies as well.
- You will be randomly assigned to either an experimental presentation or a control presentation. The experimental presentation includes a food-demonstration, and you will be encouraged to try the completed recipes. The control presentation does not include a food-demonstration, but you will be given the recipes to take back to your dorm room.
- You will then be asked to complete a post-test asking similar questions from the pre-test to evaluate changes in knowledge.

One-Month After Survey

- Follow-up surveys will be delivered electronically via email using Qualtrics one month after the initial presentation to track the retention of knowledge, and any change in

behavior. The survey will contain similar questions as the first 2 surveys to accurately detect any change.

Confidentiality: Hard-copies of all data will be stored in a filing cabinet in a locked room. The principal investigator and advisors will be the only people with access to the data. The hard-copies will be retained for 2 years after the project ends, after which they will be destroyed by shredding. Electronic files will be stored on a computer in password-protected documents and will not be destroyed. The study will be confidential; you will have an ID number (last four digits of your cell phone number) which will be recorded on all three surveys. Your name will be used when signing the consent form.

Risks:

- Breach of confidentiality, however, data will be kept strictly confidential and tracked using an ID number, rather than names. Surveys will be stored and locked in room 133 of the Health and Human Services building.
- Taste testing: Food products being used in this presentation contain milk, dairy, and wheat ingredients. Anyone who has food allergies or intolerances should not participate in taste-testing the final products. Additional ingredient information is available upon request. The researchers are not responsible for any allergic reactions.

Payment information: After completing the demonstration and a total of three (3) surveys (pre-, post-, and 1 one-month post), you will be entered into a drawing to win one of three \$20 Amazon.com gift cards. You will be notified via email of your reward. Chances of winning depend on number of participations but are estimated to be 3:100.

Contact information: Please contact the study investigators with any questions about this research or your participation in this research. If you have any questions about your rights as a participant, you may also contact the Chair, Human Subjects Review Board at 419-372-7716 or hsrc@bgsu.edu.

Principal Investigators:

Megan Hemmelgarn	Dr. Robin Tucker-Falconer
Undergraduate Student in Food and Nutrition	Assistant Professor of Public and Allied Health
College of Health and Human Services	School of Health and Human Services
meganmh@bgsu.edu	rtucker@bgsu.edu
937-564-6500	419-372-4579

I have been informed of the purposes, procedures, risks and benefits of this study. I have had the opportunity to have all my questions answered, and I have been informed that my participation is completely voluntary. I agree to participate in this research and am at least 18 years of age.

Participant

Signature Date

By providing my email below, I agree to be contacted by the researchers for purposes related specifically to this study. You may still participate in the study without providing your email, but you will not be entered for a chance to win one of three Amazon.com gift cards.

E-mail

Appendix E

Pre-test

Last 4 digits of your cell phone number: _____

Email address you can be contacted at for a follow-up survey: _____

Age: _____

Year in College (Circle one):

Freshman

Sophomore

Junior

Senior

Graduate

Race (Select all that apply):

American Indian/Native Alaskan

Asian

Black

Hawaiian or Pacific Islander

More than one race, White

Other

Ethnicity (Select all that apply):

Hispanic/Latino

Not Hispanic/Not Latino

Height: _____ feet _____ inches

Weight: _____ pounds

Do you follow any special diet (e.g. gluten free, dairy free, etc.)?

Yes No

If yes, please specify: _____

Are you actively trying to lose weight?

Yes No

1. How many servings of vegetables do you typically eat each day? (e.g. 1 cup of fresh vegetables, 1/2 cup of cooked vegetables, 1-8 oz. glass of 100% vegetable juice)

- | | | |
|--------|--------|--------|
| a. 0 | c. 1-2 | e. 3-4 |
| b. 0-1 | d. 2-3 | f. 4+ |

2. How many servings of dairy do you typically consume each day? (e.g. 1 cup of milk, 6 oz. yogurt, 1 oz. cheese, 1 slice of cheese)

- | | | |
|--------|--------|--------|
| a. 0 | c. 1-2 | e. 3-4 |
| b. 0-1 | d. 2-3 | f. 4+ |

3. When you drink milk, which kind of milk do you usually consume?

- | | | |
|---------|-----------|---------|
| a. Skim | d. Whole | g. Rice |
| b. 1% | e. Almond | h. None |
| c. 2% | f. Soy | |

4. What kind of cheese do you usually consume?

- | | |
|------------|-------------|
| a. No fat | c. Full Fat |
| b. Low fat | d. None |

5. What kind of yogurt do you usually consume?

- | | |
|------------|----------|
| a. No Fat | c. Whole |
| b. Low Fat | d. None |

6. Which of the following is highest in calcium per serving?

- a. 3 oz. of chicken
- b. ¼ cup of almonds
- c. 1 large tomato
- d. 1 Tbsp. olive oil

7. Which of the following is highest in potassium per serving?

- a. 3 medium plums
- b. 3 oz. of salmon
- c. 1 cup of cooked rice
- d. 2 cups of raw kale

8. Which of the following contains the most vitamin D per serving?

- a. ¼ cup of almonds
- b. 1 cup of carrots
- c. 1 cup of mushrooms
- d. 1 large orange

9. Which of the following contains the most dietary fiber per serving?

- a. 1 medium coconut
- b. 1 cup of applesauce
- c. 6 oz. of yogurt
- d. 1 egg

10. How many servings of vegetables are recommended for college-aged women each day? (List one number)

11. How many servings of dairy are recommended for college-aged women each day? (List one number)

12. What barriers, if any, do you experience affecting the amount of vegetables you consume on a daily basis?

13. What barriers, if any, do you experience affecting the amount of dairy you consume on a daily basis?

Appendix F

Post-test

Last 4 digits of your cell phone number: _____

Email address you can be contacted at for a follow-up survey: _____

1. How many servings of vegetables do you typically eat each day? (e.g. 1 cup of fresh vegetables, 1/2 cup of cooked vegetables, 1-8 oz. glass of 100% vegetable juice)

- | | | |
|--------|--------|--------|
| a. 0 | c. 1-2 | e. 3-4 |
| b. 0-1 | d. 2-3 | f. 4+ |

2. How many servings of dairy do you typically consume each day? (e.g. 1 cup of milk, 6 oz. yogurt, 1 oz. cheese, 1 slice of cheese)

- | | | |
|--------|--------|--------|
| a. 0 | c. 1-2 | e. 3-4 |
| b. 0-1 | d. 2-3 | f. 4+ |

3. When you drink milk, which kind of milk do you usually consume?

- | | | |
|---------|-----------|---------|
| a. Skim | d. Whole | g. Rice |
| b. 1% | e. Almond | h. None |
| c. 2% | f. Soy | |

4. What kind of cheese do you usually consume?

- | | |
|------------|-------------|
| a. No fat | c. Full Fat |
| b. Low fat | d. None |

5. What kind of yogurt do you usually consume?

- | | |
|------------|----------|
| a. No Fat | c. Whole |
| b. Low Fat | d. None |

6. Which of the following is highest in calcium per serving?

- | | |
|---------------------|----------------------|
| a. 3 oz. of chicken | c. 1 large tomato |
| b. ¼ cup of almonds | d. 1 Tbsp. olive oil |

7. Which of the following is highest in potassium per serving?

- | | |
|-------------------|--------------------|
| a. 3 medium plums | b. 3 oz. of salmon |
|-------------------|--------------------|

- c. 1 cup of cooked rice
- d. 2 cups of raw kale

8. Which of the following contains the most vitamin D per serving?

- a. ¼ cup of almonds
- b. 1 cup of carrots
- c. 1 cup of mushrooms
- d. 1 large orange

9. Which of the following contains the most dietary fiber per serving?

- a. 1 medium coconut
- b. 1 cup of applesauce
- c. 6 oz. of yogurt
- d. 1 egg

10. How many servings of vegetables are recommended for college-aged women each day? (List one number)

11. How many servings of dairy are recommended for college-aged women each day? (List one number)

12. The information presented in the presentation was new to me (Circle one):

Strongly Disagree Disagree Neutral Agree Strongly Agree

13. This presentation held my attention (Circle one):

Strongly Disagree Disagree Neutral Agree Strongly Agree

14. I will make at least one of the recipes that were presented today in the next month (Circle one):

Strongly Disagree Disagree Neutral Agree Strongly Agree

15. What barriers, if any, do you experience affecting the amount of vegetables you consume on a daily basis?

16. What barriers, if any, do you experience affecting the amount of dairy you consume on a daily basis?

Appendix G

Post 2-test

Q1 What are the last 4 digits of your cell phone number?

Q2 How many servings of vegetables do you typically eat each day? (e.g. 1 cup of fresh vegetables, 1/2 cup of cooked vegetables, 1-8 oz. glass of 100% vegetable juice)

- 0 (1)
- 0-1 (2)
- 1-2 (3)
- 2-3 (4)
- 3-4 (5)
- 4+ (6)

Q3 How many servings of dairy do you typically consume each day? (e.g. 1 cup of milk, 6 oz. yogurt, 1 oz. cheese, 1 slice of cheese)

- 0 (1)
- 0-1 (2)
- 1-2 (3)
- 2-3 (4)
- 3-4 (5)
- 4+ (6)

Q4 When you drink milk, which kind of milk do you usually consume?

- Skim (1)
- 1% (2)
- 2% (3)
- Whole (4)
- Almond (5)
- Soy (6)
- Rice (7)
- None (8)

Q5 What kind of cheese do you usually consume?

- No fat (1)
- Low fat (2)
- Full fat (3)
- None (4)

Q6 What kind of yogurt do you usually consume?

- No fat (1)
- Low fat (2)
- Whole (3)
- None (4)

Q7 Which of the following is highest in calcium per serving?

- 3 oz. chicken (1)
- 1/4 cup almonds (2)
- 1 large tomato (3)
- 1 Tbsp. olive oil (4)

Q8 Which of the following is highest in potassium per serving?

- 3 medium plums (1)
- 3 oz. salmon (2)
- 1 cup cooked rice (3)
- 2 cups of raw kale (4)

Q9 Which of the following contains the most vitamin D per serving?

- 1/4 cup almonds (1)
- 1 cup carrots (2)
- 1 cup mushrooms (3)
- 1 large orange (4)

Q10 Which of the following contains the most dietary fiber per serving?

- 1 medium coconut (1)
- 1 cup applesauce (2)
- 6 oz. yogurt (3)
- 1 egg (4)

Q11 How many servings of vegetables are recommended for college-aged women each day? (List one number)

Q12 How many servings of dairy are recommended for college-aged women each day? (List one number)

Q13 I made at least one of the recipe(s) discussed at the presentation: If yes, which recipe did you make?

- Yes (1) _____
- No (2)

Q14 What barriers, if any, do you experience affecting the amount of vegetables you consume on a daily basis?

Q15 What barriers, if any, do you experience affecting the amount of dairy you consume on a daily basis?

Appendix H

TOMATO CUCUMBER SNACK

YIELD: **6 EACH**

PREP TIME: **10 MINUTES**

TOTAL TIME: **10 MINUTES**

INGREDIENTS:

- 1 wedge light Laughing Cow Cheese, softened
- 6 slices of cucumber
- 6 cherry tomatoes
- 6 Triscuit crackers

DIRECTIONS:

1. Top each Triscuit cracker with a cucumber slice.
2. Divide the light cream cheese and spread evenly on top of each cucumber.
3. Add a cherry tomato on the top of each.

Note: A variety of Triscuit cracker flavors, Laughing Cow Cheese, or vegetables can be used to best suit your taste preferences.

SWEET POTATO CHIP FRIES

YIELD: **AS MANY AS YOU WANT**

PREP TIME: **5 MINUTES**

COOK TIME: **5 MINUTES**

TOTAL TIME: **10 MINUTES**

INGREDIENTS:

- 1 large sweet potato, scrubbed clean and any brown spots trimmed off
- 1 teaspoon extra virgin olive oil
- 1/2 teaspoon salt
- 1/4 teaspoon ground pepper

DIRECTIONS:

1. Cut off ends of the sweet potato and evenly slice the potato. The thickness of each slice depends on your desired outcome.*
2. Put in a bowl and add oil, salt and pepper. Toss to coat. I use my hands.
3. Cut out a piece of parchment paper in a circle to fit the tray in your microwave. Place sweet potatoes in a single layer on tray. Microwave on high power for 3 1/2 to 4 minutes or until crispy but not browned. Watch carefully for the first batch or two to determine the proper time since all microwaves are slightly different. 3 1/2 minutes was my perfect number. Repeat this step until all chips are cooked. Best served immediately.

*If the sweet potato is cut into thicker slices, the final product will contain a "fry-like" texture rather than a crunchy potato chip.

FROZEN YOGURT BARS

YIELD: **3-4 SQUARE SANDWICHES**

PREP TIME: **5 MINUTES**

FREEZE TIME: **4 HOURS**

TOTAL TIME: **5 MINUTES AND 4 HOURS**

INGREDIENTS:

- 6-8 square graham crackers, any variety*
- 1 carton (6 oz.) nonfat Greek yogurt, any flavor*
- 1/2 cup thawed reduced-fat whipped topping

DIRECTIONS:

1. Arrange half of the graham cracker squares on a plate.
2. Stir yogurt and whipped topping together.
3. Spread yogurt mixture over the prepared graham crackers.
4. Top each with remaining graham crackers.

5. Freeze 4 hours, or until desired texture.

Note: For additional flavor add spread to the graham cracker prior to adding the yogurt mixture, or add toppings into the yogurt mixture. Add-ins include: Hazelnut spread, peanut butter, frozen fruit, chocolate chips, butterscotch chips.

*Various graham cracker flavors (original, honey, cinnamon, chocolate, etc.) and various yogurt flavors (strawberry, coconut, key lime, vanilla, blueberry, etc.) give an opportunity to be creative with this recipe and allow you to create something to satisfy your taste buds!

GREEK YOGURT RANCH DIP

YIELD: **6 OZ**

PREP TIME: **5 MINUTES**

TOTAL TIME: **5 MINUTES**

INGREDIENTS:

- ½ package of Hidden Valley® Greek Yogurt Dips Mix
- 1- 6oz container of plain Greek yogurt

DIRECTIONS:

1. Divide the contents in the Hidden Valley® Greek Yogurt Dips Mix in half. Place half the mix in a sealed container to store for later use.
2. Mix half the contents of the Hidden Valley® Greek Yogurt Dips Mix in with the plain Greek yogurt.
3. Stir contents until well blended.
4. Enjoy the dip with vegetables such as carrots, celery, broccoli, cauliflower, etc.

Note: This recipe can also be for chip dip or as a spread on sandwiches.