A Six-Week Cooking Program of Plant-Based Recipes Improves Food Security, Body Weight, and Food Purchases for Food Pantry Clients

Amanda Schroeder Hege
Sodexo Mid-Atlantic Dietetic Internship
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Objectives

- Review keywords
- The need
- Objectives & Hypothesis
- Methodology
- Results
- Conclusion
- Strengths
- Critique
- How does this apply?
Overview of Article

• Journal of Hunger & Environmental Nutrition
• March 2013
• Authors:
  ▫ Mary M. Flynn, Steven Reinert, Andrew R. Schiff
  ▫ The Miriam Hospital, Providence, RI
  ▫ Lifespan Information Services, Providence, RI
  ▫ Rhode Island Community Food Bank
• Funders:
  ▫ A donation from Claire and Jeffrey Black
  ▫ BlueAngel Grant from Blue Cross Blue Shield of Rhode Island
Keywords

- **Food insecurity**
  - Not having dependable, consistent access to enough food due to limited money and resources
- **Plant-based diets**
  - Emphasize fruits, vegetables, legumes, and whole grains
- **Food pantry clients**
  - Households of low socioeconomic status that visit a food pantry for food once in the past year
- **Hunger-obesity paradox**
  - Low-income, food insecure individuals are at increase risk for obesity due to additional risk factors associated with poverty
The Need

• 1 in 6 Americans is Food Insecure\(^1\)
• Thrifty Food Plan (TFP) – minimal-cost meal plan based on Dietary Guidelines developed by the USDA
  ▫ Assumes purchasing of & access to raw foods, sufficient time, required skills, and recipes
• Lean meat, poultry, and seafood = most expensive items on a food budget
• Low-income households spend 50% of food budget on meat
• Adults living with the most severe levels of food insecurity have more than twice the risk of diabetes than adults who have ready access to healthy foods.\(^2\)
• Relationship between food insecurity and diet-related chronic health conditions.\(^3\)
Study Objectives

• Objectives
  ▫ Improve the food purchases of food pantry clients while decreasing food expenditures by using a 6-week cooking program including plant-based recipes that include extra virgin olive oil.

• Goal
  ▫ Participants would use the recipes for 3 meals per week.

• Hypothesis
  ▫ Recipes will be acceptable to the participants, increase vegetable consumption, improve food security, and not adversely change body weight.
Participants

• Recruitment
  ▫ From emergency food pantries and low-income housing sites
  ▫ October 2008 – March 2011
• Inclusion Criteria
  ▫ Access to transportation to attend study meetings and cooking classes
  ▫ Willingness to try new recipes
  ▫ Ability to be reached by telephone
• 85 clients, 63 completed
Protocol

- 34 week study
- Raising the Bar on Nutrition (RTB) Protocol
  - Program of the Rhode Island Community Food Bank
- Divided into 3 contiguous periods:
  - Baseline – 4 weeks prior to cooking classes
  - 6 weeks of cooking classes
  - 6 month follow-up
- Cooking Classes
- Study Appointments
Cooking Classes

- Recipes
  - Developed by Mary Flynn, PhD, RD
  - Based on a plant-based, olive oil diet
  - Made with extra virgin olive oil (1-2 Tbsp)
  - 2 servings vegetables, did not contain meat/poultry/seafood
  - 2-3 servings starch, whole grain pasta, brown rice
  - Used canned/frozen foods
  - Average cost $1.10 per serving
- Observed preparation of recipes and tasting
- Discussion of themes each week
  - Health benefits of extra virgin olive oil and how to cook with it
  - Meat/poultry/seafood is not needed daily
  - Vegetables and starches contain protein
- 3-4 participants per class
- 30 minutes
- Participants took a bag of groceries with ingredients to make 3 of the provided recipes at home
Class 2: Spinach, beans and pasta

Makes 4 servings

Ingredients:

6 tablespoons extra virgin olive oil
2/3 cup frozen, defrosted chopped spinach
15 ounces can cannellini beans, drained and rinsed
28 ounces can, diced tomatoes
13.2 ounces (dry weight) pasta, preferably whole wheat (you can use 12 oz).

Optional: garlic, herbs (rosemary, basil, thyme, oregano); salt and pepper

Tip: A typical serving of leafy vegetables (e.g. spinach) is 1 cup. For frozen spinach, however, 1/3 cup frozen is equal to 2 cups fresh. So 2/3 cup of frozen spinach is equal to 4 cups fresh or 4 servings of spinach. Like always, participants are free to use raw or canned vegetables.

Tip: To make sure that the recipe appeals to everyone, ask participants what herbs you should add (of the available options) and what other herbs they would add if making this recipe in their own kitchen.

Directions:

1) Heat a large pot of salted water to cook the pasta. When the water boils, cook the pasta as directed on the box.
2) Heat the olive oil on medium (4 to 5 on the dial) in a frying pan about 12 inches wide. Add any optional ingredients (garlic, herbs) and stir to combine.
3) Stir in the defrosted spinach; season with salt and pepper. Cook for about 5 minutes.
4) Add the drained, rinsed cannellini beans; heat on medium 5 to 6 minutes, stirring often.
5) Add the canned tomatoes; turn the heat to low and heat until the pasta is cooked.
6) Toss with cooked pasta and serve.

Tip: To make sure that the pasta and meal finish at the same time, turn on the water to boil before class starts. Put the pasta in the water at around the same time that you put the spinach in the hot pan. Try to avoid letting the pasta sit in the strainer while the meal finishes, as the pasta can become clumpy. You can also choose to make the pasta before class starts.

<p>| Cost for total recipe: | $4.64 |
| Cost per serving:      | $1.16 |</p>
<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Why its good</th>
<th>Excellent sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium</td>
<td>- May help maintain healthy blood pressure</td>
<td>Sweet potatoes, white beans, tomatoes and tomato products, beet greens, soybeans, lima beans, spinach, lentils, kidney beans, cooked greens, carrot juice, prune juice</td>
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<tr>
<td>Fiber</td>
<td>- May help reduce cholesterol levels and lower risk of heart disease.</td>
<td>Navy beans, kidney beans, black bean, pinto beans, lima beans, white beans, soybeans, split peas, chick peas, black eyed peas, lentils, artichokes, apples, pears, blueberries</td>
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<tr>
<td></td>
<td>- Also helps with proper bowel function</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Also foods that are high in fiber help provide feeling of fullness after eating fewer calories</td>
<td></td>
</tr>
<tr>
<td>Folate</td>
<td>- Helps the body form red blood cells</td>
<td>Black eyed peas, spinach, asparagus, melons, orange, all green leafy vegetables (folium is Latin for leafy green)</td>
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<td></td>
<td>- Required for DNA synthesis</td>
<td></td>
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<td></td>
<td>- Decreases cancer risk by keeping DNA healthy</td>
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<tr>
<td></td>
<td>- Should be eaten regularly by women of child bearing age to reduce risk of birth defects</td>
<td></td>
</tr>
<tr>
<td>Carotenoids</td>
<td>- Cancer protection</td>
<td>Sweet potatoes, pumpkin, carrots, spinach, turnip greens, mustard greens, kale, collard greens, winter squash, cantaloupe, red peppers, Chinese cabbage</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>- Helps heals cuts and wounds</td>
<td>Red and green peppers, kiwi, strawberries, sweet potatoes, kale, cantaloupe, broccoli, pineapple, Brussels sprouts, oranges, mangoes, tomato juice, cauliflower</td>
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<tr>
<td></td>
<td>- Also helps your body absorb iron</td>
<td></td>
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</tbody>
</table>
Study Appointments

- **3 appointments**
  - Baseline – 4 weeks prior to cooking program
  - After 6 week cooking classes
  - Follow-up – 6 months after classes

- **Data Collected**
  - Height, Weight
  - Waist circumference

- **Questionnaire**
  - Assessed current Supplemental Nutrition Assistance Program (SNAP) Benefits
  - Size of household
  - Age of members
  - Race
  - Current food habits
  - Changes from last appointment including changes in shopping/cooking/eating

- **US Household Food Security Survey Module to provide a food insecurity score (FIS)**
- **Provide grocery receipts for all foods purchased since the last appointment**
Results - Diet, Health, Food Purchases

- Improvement in number of reported plant based meals per week
  - Baseline: 5%
  - Follow-up: 60%

- Increase in vegetables and fruits
  - 78% reported eating more vegetables
  - 44% reported eating more fruits

- Improvement in BMI and weight
  - 49% weighed less at follow-up

- 76% participants reported recipes were easier, took less time

- 94% participants reported plan to continue using recipes
Changes in Food Purchases

**TABLE 1** Average Dollars/Week Spent on Individual Foods and Total Foods for Household (*n* = 63)

<table>
<thead>
<tr>
<th>Item</th>
<th>Baseline (mean ± SD)</th>
<th>6-Month follow-up (mean ± SD)</th>
<th><em>P</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole grain products</td>
<td>0.38 ± 0.09</td>
<td>0.39 ± 0.07</td>
<td>.55</td>
</tr>
<tr>
<td>Meat</td>
<td>16.45 ± 2.20</td>
<td>7.54 ± 0.71</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Carbonated beverages</td>
<td>1.45 ± 0.32</td>
<td>0.62 ± 0.12</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Desserts</td>
<td>4.85 ± 0.64</td>
<td>2.28 ± 0.24</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Snacks</td>
<td>2.11 ± 0.36</td>
<td>0.95 ± 0.13</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Total spent on food</td>
<td>67.68 ± 5.47</td>
<td>37.12 ± 2.87</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>
Results - Food Security

- **Food Pantry**
  - 68% at baseline reported using food pantry
  - 54% at follow-up reported using food pantry

- **Food Insecurity Score**
  - >3 = Food insecure
  - >8 = Food insecure with hunger
  - 48% scored >3 at baseline
  - 33% scored >3 at follow-up
  - 14% scored >8 at baseline
  - 3% scored >8 at follow-up
Conclusion

• Food pantry clients who adopt plant-based, olive oil/meatless diet for 2-3 meals a week will:
  ▫ Decrease total food cost
  ▫ Decrease purchases of nutrient-poor food items
  ▫ Improve diet quality
  ▫ Improve food security
  ▫ Improve body weight
Strengths

• Receipts provided showed changes in food purchasing behavior
• Length of study
• Diversity of population, age, and households with and without children
• Demonstration of recipes showed serving sizes, ease of preparation, and allowed participants to try them
• Recipes require only 10-15 minutes to prepare
• Demonstrating the recipe appealed to those w/o cooking skills
Critique

- **Confounding variables**
  - Unable to track food provided by food pantries or purchased at farmers markets
  - Unable to determine if households submitted all of their receipts
  - Physical activity?
  - Dietary recall? Improvement in purchase, improve intake?
  - Fasting vs non-fasting body weights
  - Food provided to participants may affect food security

- **Small study sample**
- Primarily women (84%)
- Those deciding to participate in the program were motivated and already ready to change
- Further research is needed!
How does this apply?

- Based on the Mediterranean diet
- Shows common myth “Eating healthy cost more”
- Realistic way for clients, in a variety of places, to eat well
- Raising the Bar on Nutrition guide contains useful topics and mini-lessons - suitable for a wide range of audiences
Resources


Questions?

Thank you!