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FNDH 600 Public Health Nutrition

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Nutrition Education in Adults

Service Learning Project

**Increasing Vegetable Consumption by Decreasing Vegetable Food
Waste or...**

Eat Your Trash!

Cooking Matters® for Adults

Coos County, NH

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BACKGROUND

Service learning is a teaching and learning method that pairs meaningful community service with instruction and reflection to enrich learning experiences, explore civic responsibility, meaningful community service and strengthen communities [15]. Studies on service learning have shown “positive impacts on social skills, empathy, awareness, understanding, and concern regarding community issues, pro-social reasoning and decision-making, plus greater confidence and abilities to work with diverse populations” (as cited in Rosenkranz, 2012). Therefore, a service learning nutrition project has been assigned as part of the FNDH 600 Public Health Nutrition curriculum at Kansas State University.

There are numerous areas where nutrition education, if properly designed, can have a beneficial influence over behavior modification that can lead to a positive influence on over-all health and well-being. For instance, significant evidence exists indicating American adults are not consuming the USDA recommendations for fruit and vegetable consumption [11, 17]; that increasing consumption of fruits and vegetables (including unsweetened fruit and vegetable juices) decreases incidences of chronic disease [9, 20]; that a number of barriers exist in low-income areas preventing the consumption of the USDA recommended daily servings of fruits and vegetables [10, 12, 19]; and that community based nutrition classes that include cooking lessons have been beneficial with increasing the efficacy of produce preparation and consumption [6, 8, 18].

One such program is [Cooking Matters®](#), a national program sponsored by Share Our Strength [NO KID HUNGRY®](#) that empowers adults, families and adolescents with the skills necessary to stretch their food dollars and cook healthy meals at home. A long-term evaluation of the impact of these classes reported a 10% increase in cooking confidence and an 11% decrease in barriers to healthy, affordable meals [5]. Several different Cooking Matters® courses have been designed with various audiences in mind: teens, families and adults, all of whom must meet low-income requirements to participate. The courses are two hours long, once a week for a six-week duration. Participants are encouraged to commit to all six lessons. These courses are coordinated through various non-profit organizations (cooperative extension officers, etc.) and hosting facilities (community church w/ a kitchen, Section 8 housing unit w/community kitchen space, etc.). The coordinating non-profit receives funding to cover equipment (basic kitchen accessories), cutting boards, knives, aprons, etc. Additionally, each participant receives a Cooking Matters® lesson

booklet, the ingredients each week to make the items designated, and a take-home bag that includes all the ingredients to make those items again at home.

I team-taught a Cooking Matters for Teens course in 2015 so I am familiar with the arrangement and thought this would be a good venue to explore a service learning nutrition lesson for adults. I contacted the area coordinator to determine the opportunity of participating in a nutrition education segment for adults. Even though this program utilizes a nutrition/cooking handbook, several shortfalls or limitations were noted. For instance, feedback from previous adult classes and coordinator observations indicated some barriers to increasing vegetable consumption in particular, among participants as: produce being wasted because of spoilage (and therefore perception of money being wasted), less expensive fresh produce items resulted in a high amount of food scraps (perceived waste), and lack of experience with the flavors/textures and how to prepare a wider variety of produce, particularly items available at the local farmer's market. A discussion on the increased availability of SNAP EBT cards at the farmer's market and possible barriers (perceived or otherwise) to increasing participation among lower income adults ensued, but because the farmer's markets in Northern NH will not open this year in time for inclusion in this project, we excluded addressing those barriers (although this had been my original thought when designing my poster) [13].

JUSTIFICATION

Nutrition education has been defined as “any combination of educational strategies, accompanied by environmental supports, designed to facilitate voluntary adoption of food choices and other food and nutrition-related behaviors conducive to health and well-being; nutrition education is delivered through multiple venues and involves activities at the individual, community, and policy levels” [3]. Nutrition education generally has three components: a motivation phase focusing on “why” to make changes; an action phase, focusing on “how” to make changes, and an environmental component “where nutrition educators work with policymakers and others to promote environmental support for action” [3], with each component based on appropriate theory and research.

Nutrition education based solely, or even primarily on knowledge or skills has been shown to be less effective than delivery that included action [3]. In fact, a critical review of more than 300 studies indicated that nutrition education is more likely to be effective when the focus is on behavior → action and “systematically links relevant theory, research and practice” [3] (as opposed to only knowledge) [1, 2, 3, 12].

The health-related target behaviors previously identified (increasing vegetable consumption by decreasing three perceived barriers: resources wasted on produce spoilage, excessive waste associated with some fresh produce (perceived inedible portions) and inexperience with a variety of vegetable flavors/textures and preparation methods) could effectively be addressed by several theories or models of behavior change, but I decided to focus on the social cognitive and perceived behavioral control models. The latter addresses the perception of the level of difficulty of a task; and the former adheres to observational learning (people learn while watching others), learning happens with the interaction between personal and environmental factors, and self-efficacy (confidence increases by performing the desired behavior) [7]. Therefore, my activities needed to be hands-on to build self-confidence in the participants, demonstrate effective barrier removal between personal and environmental factors and allow for the group to not only watch me, but more importantly, watch each other performing the designated tasks [7].

The Cooking Matters® for Adults classes were being conducted at Brookside Apartments community room (a section 8 housing facility) in Berlin, NH. As this six-week class was already in progress, we decided I would present my class during the fifth class (of 6). I would have 45 minutes to give my presentation (including a brief evaluation) to keep within the time constraints of the participants and room reservation. I decided I would focus on two of the three barriers: increasing efficacy of produce spoilage prevention and utilization of edible “waste” to stretch the food budget. Through further discussions with the program coordinator, we decided I would present a sampling of vegetables that could be incorporated into several different dishes/recipes (or stand-alone) rather than making a full recipe/s.

My inputs: a custom lesson plan adapted from the Cooking Matters® for Adults 2016 Handbook; evidence based research on service learning in higher education, nutrition education, social cognitive theory and barriers to increased vegetable consumption in low income populations, confirmed by this group of participants by the program coordinator (the latter sets the stage and confirms the motivation – the “why” – for making a change, i.e. the desire to eat more produce, stay within budget and not allow avoidable waste) [3, 7]. Additionally, I coordinated the use of kitchen equipment (cuttings boards, knives, gloves, aprons and baking sheets), and some regularly used staples (salt, pepper, olive oil, foil, dish soap, paper towels, and paper plates). I provided the produce for both the storage demonstration and the “edible” waste demonstration/food sampling. While I did not find evidence-based research *specifically* on utilizing typical vegetable waste/scraps as a cost-saving way to increase vegetable consumption, numerous research exists supporting the efficacy of group cooking classes (particularly those that include a shopping tour that

incorporates produce identification and storage methods) as having measurable positive impact on increasing vegetable consumption [5, 6, 8, 18]. When food rationing ended after WWII, creative and *expected* utilization of kitchen “waste” fell out of favor, but is recently back in the limelight as a way to feed more hungry people and reduce CO² and methane emissions [16]. Because the program design of the Cooking Matters® programs incorporates a grocery store tour and this group had already participated, I did not repeat this portion (produce identification/pricing methods, etc.).

My outputs: participants briefly discuss produce they avoid purchasing because of spoilage issues. A demonstration is given of a few on-hand produce items and a verbal discussion of how to extend the shelf-life of items brought up during the discussion, including utilizing the freezer. Participants observe a demonstration of vegetable “scrap/waste” utilization and then participate in preparing vegetable “edible scrap” parts for consumption. During vegetable prep, participants discuss various flavors and textures they enjoy when eating vegetables. Participants also engage in discussion of budget-stretching strategies regarding produce purchases (i.e. lower cost of buying full-stock fresh broccoli vs. broccoli crowns or florets). Leader demonstration, group discussion and active participation increase self-efficacy and perceived behavioral control [1, 3, 4, 7]. Participants taste the cooked “edible scraps” and discuss their flavor, texture and over-all usefulness in achieving their goals (increasing vegetable consumption/decreasing wasted resources [food and money]).

My outcomes – short term: participants will be armed with several creative ways to utilize fresh vegetables, particularly those that typically produce a large amount of edible scrap “waste”. Participants will also be able to stretch their food budgets by increasing the storage time of produce by learning proper buying and storage techniques. **Long term:** because of the short duration of this service learning project, it was not possible to track mid- or long-term outcomes for these participants. However, based on the intervention design methods utilized in this lesson and the positive evaluations from the participants, it would be expected that these participants will maintain their motivation to both increase produce consumption by decreasing wasted resources as demonstrated by utilizing edible “scraps” and increasing the shelf life of fresh produce.

SESSION DELIVERED & LESSONS LEARNED

Although not intentionally one of my designated theories of behavior change, I noted by providing an opportunity for group input and discussion surrounding the desire to increase vegetable consumption but avoiding

wasted resources, the participants were modeling social/subjective norms, i.e. the perception from the group members that change was expected and an openness for learning new skills to facilitate that change was demonstrated by all.

Initially, the lesson was planned to begin with produce storage techniques, but realizing time constraints, I switched the order of activities to start with preparation of vegetable items that typically produce a lot of edible “waste” so these could be roasted while we discussed produce storage techniques. This worked out well without any hiccups. I wanted to include at least one familiar (and usually well-liked) vegetable and prep method, so I brought in large sweet potatoes to make baked sweet potato fries – leaving the skins on (usually the discarded portion). I also peeled the largest potato, demonstrating the amount of edible waste created (especially when multiplied by more potatoes). One participant has Parkinson’s disease and needed some help cutting up the potato. I wish I had a tool available for people who have difficulty using a standard knife for such tasks (those with acute arthritis for instance), *if such an item exists*. Next, I used a large bag of huge carrots. After scrubbing clean, each of the participants peeled the carrots, which resulted in a decent pile of edible “scraps”. The carrots were bagged and set aside. Next, I brought out a few bunches of kale and beets with greens still attached. After washing, I demonstrated how to “de-stem” the kale and the beet greens, and passed these around for the group to work on. I discussed how to revive wilted greens (including those attached to beets). Lastly, fresh broccoli with large stalks were washed, stalks removed and passed around for dicing.

The stems/stalks are usually considered waste and either tossed in the compost heap or the trash. I wanted to demonstrate their usefulness on the plate as well as the palate. The sweet potatoes would take the longest to bake, although I purposely reduced this time by having the participants cut them into narrow matchsticks (batonnet). Using a mixing bowl, I seasoned the potatoes with 2 tbsp. of olive oil, salt and black pepper and passed the bowl around to be tossed. We briefly discussed other seasonings (fresh and/or dried herbs) that could also be used. I asked a couple of participants to spread the potatoes out onto a foil-lined baking sheet and pop them into the pre-heated oven. Using the same bowl, we seasoned the carrot peels, and the sliced beet and kale stems, keeping each separate so they wouldn’t “bleed” together. In the end, we ended up with colorful “lanes” of attractive vegetables of varying cuts (long flexible strips [carrots], matchsticks [potatoes], small diagonal chunks [beet stems], small dices [broccoli stalks] and medium dices [kale stems]. Comments were made on how wonderful the room was smelling and excitement at tasting our “trash”! I dished up sample sizes for each person and all but one person, eagerly dug in (the hesitator joined in after watching everyone else’s apparent enjoyment). I asked them to think about flavor, textures and taste and how these

could be manipulated even further. With a couple minutes to spare, I passed out the evaluation, a simple Likert scale containing eight questions, and asked for each participant to provide their honest feedback. I thanked each of them for allowing me to participate in their class and especially for trying something new. Each of them seemed genuinely pleased with the class. This is a lesson that could certainly be expanded, and I would love to teach it again! I get most excited when I can influence change that touches multiple areas of public and environmental health. Thank you for this opportunity. ☺

PHOTOS



Cooking Matters for Adults participants at the beginning of the transition from Heidi's portion of the class (she's standing on the right) to mine (I'm standing on the left). There were ten participants signed up for this class, but two did not make it in on this day. Considering Berlin, NH has a population of just over 9,500, I think this is pretty good attendance!

Here I am demonstrating how to orient a sweet potato to determine size of baked sweet potato fries, and below I'm showing Doris how to get uniform cuts so all the potatoes will be done at the same time (notice we are keeping the skins ON)! :-)



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EVALUATION

Included in “Supporting Materials” is one of the completed evaluation sheets. The totals are as follows:

STRONGLY DISAGREE	DISAGREE	UNCERTAIN	AGREE	STRONGLY AGREE
1	2	3	4	5

Question 1: Before participating in this class, I regularly ate 5-9 servings of fruits and vegetables per day.

Totals: Strongly Disagree = 6, Disagree = 2

Question 2: After participating in this class, I plan to eat more vegetables than I normally do.

Totals: Strongly Agree = 5, Agree = 3

Question 3: Before participating in this class, I sometimes had to throw out produce that had spoiled before I could use it.

Totals: Strongly Agree = 4, Agree = 4

Question 4: I learned some new ways to handle produce to increase storage time and decrease spoilage

Totals: Strongly agree = 8

Question 5: I have eaten vegetable “waste” or “scraps” before participating in this class.

Totals: Strongly disagree: 2, Disagree: 4, Agree: 2

Question 6: I enjoyed the samples of vegetable “waste” or “scraps” that we made today.

Totals: Strongly agree: 5, Agree: 3

Question 7: I think using the edible “waste” or “scraps” from produce is a nutritious way to stretch my food budget.

Totals: Strongly agree: 5, Agree: 3

Question 8: This class was fun, and I would recommend it to someone else.

Totals: Strongly agree: 8 😊

CONTACT INFORMATION

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SUPPORTING MATERIALS

SLP Nutrition Education Poster before making necessary changes (final model already described above under “JUSTIFICATION”):

HELP! I Bought Some Produce from the Farmer’s Market, Now What do I do? – A Lesson on Produce Preparation

Who: Income qualified participants of Share Our Strength, Cooking Matters for Adults®

What: An interactive lesson on efficient use and storage of local produce

When: TBD

Where: Brookside Apartments Community Room, a Section 8 housing complex in Berlin, NH

Why: Ongoing communications with regional program coordinator revealed need for hands-on fresh produce handling techniques specifically geared towards food waste prevention and creative utilization of a wide variety of vegetables.



Background:

- Low income adults are challenged to meet the dietary recommendations set forth in the [USDA and DHHS Dietary Guideline for Americans](#)¹ for fruit and vegetable consumption
- Barriers to increased produce consumption specific to this group include lack of knowledge and experience with efficient utilization, creative usage and proper storage to prevent waste
- Utilizing hands-on learning will increase confidence and effectiveness of techniques demonstrated

Social Cognitive Theory:

- ❖ People learn by watching others (observational learning)
- ❖ Learning happens with the interaction between personal and environmental factors.
- ❖ Confidence increases (self-efficacy) by performing the desired behavior

INPUTS

Custom lesson plan adapted from Share Our Strength, Cooking Matters for Adults® 2016 Instructor Handbook
Research on Social Cognitive Theory and barriers to increased fruit and vegetable consumption in low income populations
Handouts on proper produce storage, low waste utilization techniques and original recipes
Feedback Questionnaire
Coordinated provision of utensils, cutting boards, kitchen equipment and produce/ingredients

OUTPUTS

Conduct a group discussion of produce to be used, including identification of each item and creative healthful uses
Demonstrate proper storage of each item to increase shelf life
Assign each person to a workstation and a task to contribute to recipe prep
Discuss benefits of decreasing waste and utilizing commonly discarded edible parts
Taste prepared dishes and discuss the results

OUTCOMES

SHORT TERM – participants will be armed with several creative ways to utilize fresh vegetables, particularly those commonly found at the Berlin Farmer’s Market
Participants will be able to stretch their food budgets by increasing the storage life of their produce and decrease food waste by utilizing commonly discarded vegetable parts
LONG TERM – steadily increase comfort level with preparation of a greater variety of vegetables, thus increasing daily enjoyment & consumption

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