MEAL PATTERNS OF LOW-INCOME ADULTS PARTICIPATING IN THE SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM EDUCATION (SNAP-ED) IN GEORGIA: ADHERENCE TO SOUTHERN MEAL PATTERNS

by

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(Under the Direction of Jung Sun Lee)

ABSTRACT

Cultural competency is important in development and implementation of nutrition education curriculum; however, attention to unique foodways has not been carefully considered in developing curriculum targeted to low-income Georgians. Georgians are exposed to the regional foodways of the U.S. South and may have unique nutrition education needs. This study identified meal patterns of low-income adults participating in the Supplemental Nutrition Assistance Program Education (SNAP-Ed) Food Talk program in Georgia with a focus on adherence to southern meal patterns and preparation methods. There were 332 participants included in the analytic sample (mean age: 56.6 ± 20.6, 81.7% female, 72.5% African American, 34.0% SNAP participation). Southern meal patterns made up about a third of breakfasts and a quarter of dinners consumed upon enrollment and exit of the Food Talk program. This exploratory study may serve as a reference for the development of culturally appropriate nutrition education curriculum for SNAP-Ed participants in Georgia.

INDEX WORDS: Cultural competency, nutrition education curriculum, low-income, meal pattern, SNAP-Ed

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BS, Louisiana State University, 2014

A Thesis Submitted to the Graduate Faculty of the University of Georgia in Partial Fulfillment of the Requirements for the Degree

MASTER OF SCIENCE

ATHENS, GA

2016

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August 2016

ACKNOWLEDGEMENTS

I would like to thank my family and all of my friends for being a great support for me during my academic career and inspiring me to continue with my goals. I would like to thank my committee members for their support, patience, and flexibility to deal with unexpected changes in my thesis. I especially would like to thank my advisor, Dr. Jung Sung Lee, for all of her support, guidance, and tireless efforts to help me produce the best work that I truly enjoy doing. I would like to thank all of the members of the University of Georgia SNAP-Ed team who worked hard to run the SNAP-Ed program, including both the individuals at the state office and the paraprofessionals who go out into the field and make the Food Talk program a reality. I also want to acknowledge all of the students, faculty, and staff in the Department of Foods and Nutrition at the University of Georgia. Many of you have served as great mentors and social support for me over the course of my time here, and it has made a huge impact on my experience at this school. Lastly, I would like to thank the other faculty and staff at the University of Georgia who I have had the chance to meet and know through my involvement with student organizations and coursework outside of the Department of Foods and Nutrition.

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CHAPTER I

INTRODUCTION

In 2014, the official poverty rate in the United States was 14.8%, accounting for approximately 9.5 million families and 46.7 million people. Poverty amongst adults is higher in the southern region of the United States (16.5%), and Georgia has an overall poverty rate of 16%. Food insecurity as a potential consequence of poverty is linked to poor diet quality, poor nutrient intake, negative health outcomes, and overall reduced quality of life. Federally funded nutrition assistance programs like SNAP have been created to overcome the barriers of food insecurity, and nutrition education programs like SNAP-Ed can help improve dietary intake and behaviors. While the development of these programs have included aspects of cultural competency, cultural foodways are not a focus in these programs. Understanding meal patterns of specific regions or cultural groups can help program developers encourage existing dietary behaviors or target areas for education. Georgians are a part of a unique southern foodway system that differs from the standard American diet in significant ways, so existing programs in Georgia may not meet all of the needs of its participants. The current SNAP-Ed Food Talk program from the University of Georgia does not examine the cultural foodways of its participants, thus analysis of specific meal patterns is needed.

This is an exploratory study to identify meal patterns of low-income adults participating in the SNAP-Ed Food Talk program in Georgia with a focus on adherence to southern meal patterns and preparation methods. The specific aim is to: Identify and

describe the types of meal patterns consumed and degree of following southern meal patterns. Meal pattern will consider meal composition, types of foods consumed under four major food groups (i.e., fruits, vegetables, carbohydrates and grains, and protein groups), and southern food preparation methods. A southern meal pattern consists of traditional preparation methods and foods consumed and influenced by the intersecting cultures of Southeastern Native Americans (e.g. corn and corn products, beans, greens), Africans (e.g. okra, legumes, frying) and European colonial settlers (e.g. wheat-based products, pork, peaches, beef and dairy products).

CHAPTER II

LITERATURE REVIEW

Characteristics of Low-Income Adults

In 2014, the official poverty rate in the United States was 14.8%, accounting for approximately 9.5 million families and 46.7 million people (DeNavas-Walt & Proctor, 2015). When examined from the demographics of race, gender, marriage status, and geographical location, inequities emerge in the distribution of poverty. In the United States, individuals who identify as Black have the highest rate of poverty with 26.2% of people living in poverty. While this number is similar to the rate of Hispanics of any race who are in poverty (23.6%), this disparity is staggering when compared to non-Hispanic Whites or Asians, who have poverty rates of 10.1% and 12.0%, respectively. In families with a female head of household, 30.6% of families were in poverty while the poverty rate for families with male head of household was 15.7% and the poverty rate for a married-couple family was 6.2%. Poverty rates for females overall were higher than males ages 18 years or older. When comparing poverty rates among geographical regions, there are more low-income adults in the South (16.5%), followed by the West (14.6%), Midwest (13.9%), and Northeast (13.0%) regions of the United States (DeNavas-Walt & Proctor, 2015).

The state of Georgia has an overall poverty rate of 16%, which is higher than the national rate of 14.8%. In Georgia, the distribution of poverty by race and ethnicity in

2013 shows that those who identify as Hispanic or Black have the highest rates of poverty (27% and 25%, respectively), compared to non-Hispanic Whites, who have a poverty rate of 10% (Kaiser Family Foundation, 2015). Mirroring national trends, females have a higher rate of poverty than men, with the poverty rate being 17% for women and 12% for men.

Low-income individuals are more likely to be food insecure, though food insecurity is not necessarily a characteristic of low-income individuals(Coleman-Jensen, Gregory, & Rabbitt, 2015). Food insecurity is defined by the USDA Economic Research Service (ERS) with two levels, low food security and very low food security. Low food security is defined by reports of reduced quality, variety, or desirability of diet with little or no indication of reduced food intake. Very low food security is defined by reports of multiple indications of disrupted eating patterns and reduced food intake(Coleman-Jensen et al., 2015). Food insecurity has been linked to poor diet quality, poor nutrient intake, chronic morbidity, weight gain, and overall reduced quality of life (Satia, 2009). In an analysis of National Health and Nutrition Examination Survey (NHANES) dietary data from 1988 to 1994, intake of food groups including dairy, fruits, and vegetables was lower among food insecure adults when compared to food secure adults (Dixon, Winkleby, & Radimer, 2001). Seligman and colleagues examined data from NHANES between 1999-2004 to estimate the association between food insecurity and evidence of chronic disease influenced by nutrition. Individuals who were classified as food insecure were 20% more likely to self-report having hypertension or hyperlipidemia. When laboratory or examination evidence of chronic disease was included, those who were

classified as food insecure were 20% more likely to have hypertension and 48% more likely to have diabetes (Seligman, Laraia, & Kushel, 2010).

To reduce food insecurity among Americans, several government-funded programs have been implemented to provide food assistance for low-income people. The Supplemental Nutrition Assistance Program (SNAP) is the largest of these programs, and is operated through the USDA's Food and Nutrition Service (USDA FNS). The purpose of the SNAP program is to improve nutritional status of low-income households and provide economic benefits to communities (U. S. Department of Agriculture Food and Nutrition Service, 2014b). SNAP eligibility is determined by gross monthly income limits (130 percent of federal poverty level), net monthly income limits (100 percent of federal poverty level), and countable resources (US Department of Agriculture, 2014b). Nationwide, nearly 22,445,000 households, or over 45,874,000 individuals received SNAP benefits in FY 2014 (Gray & Kochhar, 2015). As of FY 2014, over 1,784,000 persons, or 824,000 households were enrolled and received SNAP benefits in Georgia (Gray & Kochhar, 2015).

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), is a program for low-income women who are pregnant, breastfeeding, or a non-breastfeeding postpartum mother, and for infants and children up to five years who are at nutritional risk. This program provides eligible persons access to supplemental foods, health care referrals, and nutrition education. WIC eligibility is determined by categorical, residential, and income requirements, as well as level of nutrition risk. WIC applicants must have an income at or below 185% of the federal poverty level (U. S. Department of Agriculture Food and Nutrition Service, 2016c). Other food assistance

funded through the federal government include child nutrition programs like the National School Lunch Program and nutrition programs for seniors like the Senior Farmer's Market Nutrition Program for low-income older adults (U. S. Department of Agriculture Food and Nutrition Service, 2014a).

Meal Patterns of Low-income Adults

Meal patterns have been described by patterning, format, and context. In the construct of patterning, temporal measurements such as frequency, spacing, timing, or regularity of meals can be discerned. Meal pattern analysis allows for examining interactions of bioactive compounds within foods, and ultimately, diet and health (Leech, Worsley, Timperio, & McNaughton, 2015). Meal pattern analysis holds an advantage over diet quality indices, however, because meal pattern constructs can provide more information about how individuals eat. Within meal pattern formatting, researchers can define types of food combinations, food sequencing, and nutrient content. Other researchers have chosen to characterize meals by their context of location, social aspects, or activities performed while eating.

Meal pattern analysis has been conducted to discern health disparities among those of differing socio-economic status and race. Kell and colleagues did a study to examine the relationship between socio-economic status and food choice, and potential differences by race (Kell, Judd, Pearson, Shikany, & Fernandez, 2015). Participants were from the nationwide REasons for Geographic And Racial Differences in Stroke (REGARDS) study (n=17,062). Socio-economic status was determined by individual education level and household income, as well as by community-level socio-economic

status (i.e., measures of education, wealth/income, and occupational prestige). Dietary intakes were assessed using the Block98 FFQ; food groups were later constructed based on nutrient composition similarities, culinary use, and data from previous studies. The dietary patterns were derived by principal component analysis and confirmatory factor analysis. The resulting dietary patterns were convenience, plant-based, sweets/fats, southern, and alcohol/salads. For each dietary pattern, high and low adherence was determined by a factor score above or below the median.

Individuals who were in the highest tiers of all socio-economic status measurements, when compared to the lowest, were more likely to consume either plant-based or alcohol/salads dietary patterns, and were less likely to have a southern or sweets/fats dietary pattern. There were also significant differences between black and white individuals when taking into account household income and adherence to certain dietary patterns. Whites with the highest tier of education were more likely to eat a plant-based dietary pattern and less likely to eat a sweets/fats dietary pattern compared to blacks with a similar education level. Whites in the highest household income tier were also more likely to consume an alcohol/salads dietary pattern. Higher community socio-economic status in whites was also associated with a greater adherence to a convenience dietary pattern. Overall, higher socio-economic status was positively associated with adherence to a plant-based dietary pattern, though education is seen to possibly be a stronger determinant of healthy dietary patterns. In the case of the southern dietary pattern, higher levels of education were negatively associated with adherence to a southern dietary pattern. The researchers suggested that such findings can be helpful for

public health campaigns in reducing intake of fried and processed meats, as well as sugar-sweetened beverages (Kell et al., 2015).

A study in Sao Paulo, Brazil examined dietary patterns among Brazilian adults (n=1,102) aged 20 years and older with attention to the specific characteristics of each meal consumed (i.e., breakfast, lunch, and dinner) (de Oliveira Santos, Fisberg, Marchioni, & Troncoso Baltar, 2015). Dietary intake data were gathered from two 24-hour recalls, and participants specified names of meals eaten to denote eating occasion. Foods from the recalls were grouped by nutritional value, intake habits of the Brazilian population, data from the literature, and the research team's experience in other studies. Further grouping of food items was done to allow for better explanation of data and food patterns. There were 13 dietary patterns identified among all three meals which explained variance among the participants. Breakfast had "healthy," "Traditional," and "snack" meal patterns. Lunch had the greatest amount of meal variance with five identified dietary patterns: "Traditional," "salad," "sweetened juice," "Western," and "meats." Dinner had dietary patterns of "coffee with milk and bread," "Transition," "Traditional," and "soups and fruits." Each of these meal patterns had positive associations for certain types of foods (e.g., the dinner "Traditional" meal pattern had a positive correlation to greens, rice, beef, and beans, yet a negative correlation to simple pasta and sauces/mayonnaise). All three meals had dietary patterns which showcased traditional foods, healthy foods, and patterns that had foods rich in fats and sodium. The look at dietary patterns by meal was also useful in finding the prevalence of meal skipping. A finding that the authors found important was the dietary pattern of "coffee with milk and bread" found in dinner occasions, which is typically a meal that is for breakfast, not

dinner, and is low in fiber. In traditional dietary pattern analysis, which looks at the pattern as a whole and not by meal, this meal interpretation could not be made. The researchers believe that this kind of analysis can be beneficial for public policies that can work to promote healthier meals for specific eating occasions.

There is little existing research on the meal patterns of SNAP participants as it relates to food combinations and food frequencies. Much research has focused on either temporal spacing of meals or the presence or absence of meals. For meal pattern research focused on the content of the diet, dietary quality indices, general intake, or the presence or absence of specific items like fruits and vegetables or sugar-sweetened beverages are used to define the diet. While these methods provide important information about the general consumption of the diet, they do not provide information about meal composition (U. S. Department of Agriculture Food and Nutrition Service, 2014a). As seen before in the literature, attention to individual meals can allow for education programs to promote healthier meals in specific eating occasions.

Federally Funded Nutrition Education Programs targeted to Low-income Americans

The Supplemental Nutrition Assistance Program Nutrition Education (SNAP-Ed) is a program operated through USDA FNS agency. According to the USDA, "The goal of SNAP-Ed is to improve the likelihood that persons eligible for SNAP will make healthy choices within a limited budget and choose active lifestyles consistent with the current Dietary Guidelines for Americans and MyPlate,"(U. S. Department of Agriculture Food and Nutrition Service, 2014a). The Healthy, Hunger-Free Kids Act of 2010 established

SNAP-Ed as the Nutrition Education and Obesity Prevention Grant Program, under the Food and Nutrition Act of 2008. This act called for SNAP-Ed to include an emphasis on obesity prevention in addition to providing nutrition education (U. S. Government Federal Register, 2016).

The Food and Nutrition Act of 2008 defines individuals who are eligible for SNAP-Ed services as those who receive or are eligible for benefits from SNAP, National School Lunch/Breakfast Program at free or reduced priced, Medicaid, Temporary Assistance for Needy Families (TANF), or other means-tested federal assistance programs or those who live in a community with a significant low-income population (greater than 40%). SNAP-Ed eligibility differs from SNAP eligibility in that participants in SNAP-Ed programs do not have to necessarily meet immigrant, employment, or resource requirements for eligibility that participants enrolled in SNAP have to meet (U. S. Department of Agriculture Food and Nutrition Service, 2016a, 2016b). States may use SNAP-Ed funds to implement evidence-based nutrition education and obesity prevention services through nutrition education, health promotion, and intervention strategies that operate on multiple levels of the socioecological model (U. S. Department of Agriculture National Institute of Food and Agriculture, 2016c).

SNAP-Ed is primarily administered through the Land-Grant University System. Land-grant colleges and universities may contract with partners such as state public health departments, tribal programs, local health organizations, and non-profit organizations to deliver SNAP-Ed. Most Land-Grant institutions, including the University of Georgia, administer their SNAP-Ed programs through affiliated state Cooperative Extension Systems (U. S. Department of Agriculture National Institute of

Food and Agriculture, 2016c). In FY 2010, over 4, 481, 000 individuals were reached through SNAP-Ed programs within the national Land-Grant University System (Sexton, 2013). The University of Georgia (UGA) is the primary SNAP-Ed implementing agency in the state of Georgia.

The direct nutrition education program implemented through UGA's SNAP-Ed program is called Food Talk. Food Talk is based on a culturally tailored curriculum founded on the Health Belief Model and the Dietary Approaches to Stop Hypertension diet. Food Talk was designed with the goal of decreasing dietary risk factors for hypertension by increasing self-efficacy and perceived benefits to improve fruit and vegetable, and dairy consumption, and limiting sodium intake, while decreasing perceived barriers to dietary changes (Hanula, 2009). The Food Talk program utilizes several methods to influence behavior change among participants including information transmission, reevaluation, identification of barriers, identification of potential solutions, and modeling. Strategies used to implement these methods include learner-centered education with reciprocal dialogue, experiential learning activities, and recipe demonstrations. The Food Talk curriculum is executed by trained paraprofessionals who are primarily recruited from the program's target audience of SNAP-eligible, low-income adults.

The SNAP-Ed Food Talk curriculum consists of 6 sessions; each session addresses some aspect of the program's goal of decreasing dietary risk factors for hypertension. For example, one session focuses on increasing the perceived benefits of lowering blood pressure to improve health and how to reduce sodium intake to achieve that goal. The recipe demonstration of Chicken Divan within that session aims to increase

participants' self-efficacy to prepare a healthy meal that includes vegetables, low-fat cheese, and low-sodium foods. Sampling of the prepared recipe aims to decrease perceived barriers (a component of the Health Belief Model), including food taste, recipe cost, and convenience, to changing their food choices.

The Expanded Food and Nutrition Education Program (EFNEP) is a program funded through Federal Extension and operates through the 1862 and 1890 Land-Grant Universities, the District of Columbia, and the six U.S. territories. EFNEP was created to address critical health concerns in the United States and utilizes a peer education model (employing paraprofessional staff) to deliver lessons on nutrition and physical activities to low-income families, especially those with children (U. S. Department of Agriculture National Institute of Food and Agriculture, 2016b). Since its inception, EFNEP has reached over 32.5 million low-income families and youth. In 2015, EFNEP educators worked directly with nearly 500,000 adults and children, and impacted over 340,000 family members indirectly (U. S. Department of Agriculture National Institute of Food and Agriculture, 2016a). The EFNEP program at UGA reached 4,848 adults and 4,037 children and indirectly reached 18,265 family members(U. S. Department of Agriculture National Institute of Food and Agriculture, 2016a) . After completing a UGA EFNEP program in FY2013, participants increased intake of fruits, vegetables, and dairy; practiced better food safety habits; increased reports of physical activity; and gained skills in food shopping and budgeting (UGA Family and Consumer Sciences, 2014). Together, SNAP-Ed and EFNEP have positively impacted nutrition and physical activity behaviors that can improve health outcomes.

Evaluating Effectiveness of Federally-Funded Nutrition Education Programs

Both SNAP-Ed and EFNEP have to undergo program evaluations to examine effectiveness of their programs. One aspect of those evaluations is through the examination of program outcomes, which can include health behaviors like physical activity, following MyPlate recommendations, food safety practices, and smart shopping. In the literature, many researchers choose to utilize diet indices to evaluate program impact on participant eating behaviors, and others choose to examine reported behaviors. Currently, there are no studies conducted in SNAP-Ed or EFNEP which use meal patterning to do program evaluation.

Utah's SNAP-Ed Cooking Basics program was able to show that participation in SNAP-Ed lessons was positively related to the intent of participants to improve nutrition-related behaviors when using the Theory of Planned Behavior model. Lesson topics included topics of menu planning and shopping, as well as MyPlate. Methods used within the lessons included a lecture component, a cooking demonstration, and a sample food tasting; participants were provided with a handout with recipes and facts from that day's lesson. To measure intent to change nutrition-related behaviors, participants completed a retrospective post-then-pre intervention questionnaire. Results showed increased intent in behaviors including consuming foods in line with MyPlate recommendations, planning menus before shopping, making food purchases based on Nutrition Facts label, and preparing meals at home at least 3 times/week (Savoie et al., 2015). A limitation of the study is that the researchers measured intent to change behaviors instead of actual

behavior change. Though intent to change behavior can be associated with behavior change, the researchers acknowledge that individuals tend to overestimate their behavior change. There was no follow-up with the participants in this study, so it is difficult to determine if any behavioral changes were made.

An analysis of data from women participants in the 8 states of the US Census Mountain region EFNEP programs showed improved overall diet quality (Guenther & Luick, 2015). Participants were provided 24-hour dietary recall forms during the first and last sessions of the program; this information was later coded into a nutrient database and diet quality was assessed using the Healthy Eating Index-2005 (HEI-2005). Average HEI-2005 scores increased from 49.1 to 55.2 ($p<0.001$) after participation in EFNEP programs, and 8 of the 12 component scores improved significantly with the exception of sodium. There was no control group in this study, therefore limiting the ability to determine how effective the EFNEP program was on improving the diet quality of its participants. Despite this, there were improvements in the diet quality of EFNEP participants.

These studies were able to measure trends in behavioral intention and diet quality, but may have missed valuable information about the meals eaten, which could be important target areas for intervention. Despite this, both of these programs were seen to be effective in either changing intentions about healthy eating patterns or improving diet quality. There is a possibility that the effectiveness of these programs were limited because of the types of cultural competency components included in, or excluded from, program development and implementation.

Importance of Cultural Competency in Nutrition Education

Culture holds a significant role in the development of health beliefs and behaviors, and is seen to be an important aspect to consider when creating health promotion programs. This was not always the case. Discussions about cultural theory in health communication arose in the early 1990s, when researchers became increasingly aware of limitations within the existing health communication paradigm. Health was solely seen as a result of individualistic factors (e.g., personal choice, knowledge) and social or cultural influences on health were not considered. Lupton (Lupton, 1994) argues that culture should be understood broadly as a way of life with many facets, and that "apart from their biomedical manifestations, health, illness, and disease may be considered products of cultural practices," (pg. 57). Airhihenbuwa (Airhihenbuwa, 1995) also states that traditional paradigms in health, education, and development has caused "the absence of meaningful participation of people and their cultures in positive behavioral transformation where appropriate," (pg. x). Consequences of not adapting or creating health promotion and by extension nutrition education to cultural needs could perpetuate inequity in social and health status. Alternatively, attention to culture within health programs can result in self and cultural empowerment to create positive health behaviors.

One model that uses a culturally sensitive approach to health promotion is the PEN-3 model (see **Figure 1**). This model was created by Airhihenbuwa and consists of

three dimensions that cover health education, educational diagnosis of health behavior, and cultural appropriateness of health behavior (Airhihenbuwa, 1990). Each dimension has three categories which form the acronym PEN. Within health education, there are the categories: Person, Extended family, and Neighborhood. Person refers to the empowerment of the individual to make informed health choices. Extended family is concerned with not only the immediate family, but extended family members. Neighborhood involves commitment to promoting health and disease prevention within the community, and involving community members and leaders with the development and implementation of health programs. Educational diagnosis of health behavior includes Perceptions, Enablers, and Nurturers. Perceptions are the attitudes, beliefs, values, and knowledge that facilitate or hinder motivation to change. Enablers are cultural, societal, systematic, or structural influences or forces that may be facilitators or barriers to change, examples of which may include resources and skills. Nurturers include the degree to which health beliefs, attitudes, and actions are influenced or nurtured by social networks. These actions could include practices around eating habits. The last category, cultural appropriateness of health behavior, involves Positive behaviors, Existential behaviors, and Negative behaviors. Positive behaviors are those that are based on health beliefs and actions that are known to be beneficial to health, and should be encouraged. Existential behaviors are those indigenous practices that have no harmful health consequences and do not need to be targeted for change or blamed in the event of program failure. Negative behaviors are those that are known to be harmful to health. Together, these three dimensions can be used to create culturally sensitive and culturally appropriate health promotion programs that are effective (Airhihenbuwa, 1995).

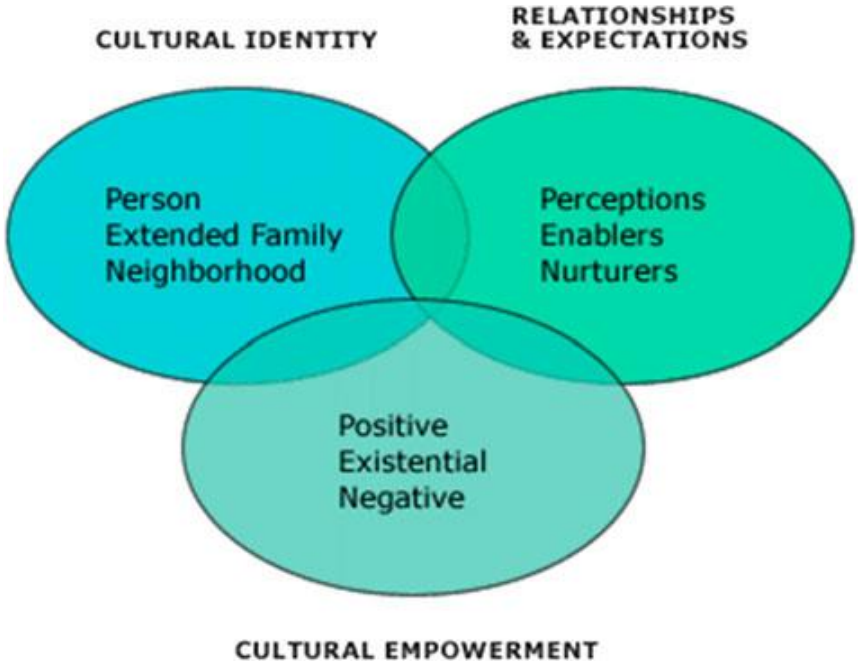

Figure 1. The PEN-3 cultural model (Iwelunmore, Newsome, & Airhihenbuwa, 2013)

An application of the PEN-3 model can be seen in a series of focus group with African Americans on factors influencing food choices, dietary intake, and nutrition-related attitudes. James and colleagues conducted a series of focus groups in north central Florida with African Americans from different socioeconomic groups and life experiences (James, 2004). Questions in the focus group guide were from three domains: concepts of healthful eating, barriers and motivators to healthy eating, and nutrition education channels. Answers from the focus groups were analyzed through the PEN-3 framework for each dimension (health education, educational diagnosis of health behavior, and cultural appropriateness of health behavior).

Use of the model identified people who would be best to target in nutrition education, and existing familial or community factors that may or may not encourage changes to dietary patterns. Looking at the perceptions of eating healthy revealed that

many believed that eating healthfully meant giving up part of their culture. Cooking culturally-based foods was seen as something worth protecting, and a tradition to pass on to future generations. There is acknowledgement by some that certain aspects of the diet needed to change, such as intake of soda, but that there are barriers to making changes. Structural barriers to healthy eating included cost of food, time, reliance on media instead of health professionals, and lack of representation in health messages. In the dimension of cultural appropriateness of health behaviors, many positive, existential, and negative behaviors related to food were identified. In addition to the affirmation of culture that occurs when eating those foods, there are certain vegetables that are consumed in high quantities. Foods considered "soul foods" were eaten infrequently, thus considered not to be harmful. Negative behaviors included lack of concern over weight-related health consequences, high intake of fat and meat, and overcooking vegetables in a manner that reduced nutrient density. Overall, the researchers found that the PEN-3 model was appropriate in assessing the community and cultural aspects involved with African American dietary habits and health outcomes, and that incorporating these aspects can make effective culturally relevant health messages and programs (James, 2004).

Often it is difficult to define what can be considered a component of culture within a group of people. In an article by Kreuter and colleagues, the example of spirituality as a cultural component used for promoting breast cancer screening within the black community was used (Kreuter, Lukwago, Bucholtz, Clark, & Thompson, 2003). It was stated, "What makes spirituality cultural in this case is not that it means the same thing to all members of the cultural group or that it exerts the same influence on each person's beliefs, decisions, and behaviors. Rather, it is that an understanding of its role

and importance within the group is shared by all members," (pg. 139). This could also apply to the role of cuisine within a population. Mintz states that a cuisine is something eaten with enough frequency that a population can easily recognize its components, tastes, and preparation methods (as cited by Shields) (Shields, 2015). Because of these social roots, cuisine is used as an identity factor to find other community members as well as to distinguish themselves from other people outside of that region(Shields, 2015).

Southern Foodways in the United States

Georgians are exposed to the unique regional foodways of the U.S. South and thus individuals living in this region may have a unique meal pattern (Latshaw, 2013). The formal designation of the U.S. South by the U.S. Census Bureau includes the states of Georgia, North Carolina, South Carolina, Florida, Kentucky, Tennessee, Virginia, West Virginia, Maryland, Delaware, Texas, Arkansas, Oklahoma, Louisiana, Mississippi, and the District of Columbia (U. S. Census Bureau, 2013). A southern meal pattern consists of traditional preparation methods and foods consumed and influenced by the intersecting cultures of Southeastern Native Americans, Africans and European colonial settlers.

According to Green, Southeastern Native American foodways have a great influence on foods that would be considered a part of a southern meal pattern today (Green, 2013). From the Southeastern Native Americans, there were a variety of meats, fish, shellfish, vegetables, fruits, and nuts that contributed to vastly diverse, nutritious, and dependent food source available to settlers. The better known practices of Native Americans that are integrated into southern meal patterns include the use of corn in

various ways—hominy, grits, cornbread, and combinations of beans and corn (Green, 2013). At one time, Native Americans had the only foodway in the region, though this would change with European colonialization. Early integration of Native American and European foodways came about in two ways: heavy dependence on Indian agricultural methods, and international trade between the Old World and the New World.

Africans influenced the southern meal pattern through food practices adopted prior to and after the slave trade. Like the Native Americans, Africans had a diet that was based in vegetables and greens, and also had unique crops such as sesame, okra, black-eyed peas, and peanuts. Africans are also responsible for the general use of hot peppers and spices in cooking southern food, and the technique of frying (Green, 2013). Integration of Native American, European and African foodways first occurred when trade between the Americas, Europe and Africa introduced new foods such as maize, sweet potatoes, and plantains to West Africa. During slavery, limited accessibility to foods created the need for dietary adaptations in traditional African foodways in order to survive harsh conditions of slavery. For example, because the quality cuts of pork were reserved for the house master, slaves only had access to and made meals from lower quality cuts of pork including pig's feet, fatback, and pig's ears. Rationing of food supplies by the slaver brought forth the need for additional ways to supplement the diet. Occasionally, there could be trade between the slaves and the Native American, or other poor whites. Sometimes, house slaves would risk stealing ingredients from the kitchens to feed themselves, or planters in the fields would hide pieces of grains in their shoes to cook later (Miller, 2013).

European colonial settlers who settled in the South brought a variety of foods to that were integrated into the meal patterns of both Southeastern Native Americans and Africans. For example, the Spanish imported produce such as melons, peaches and peppers, which were integrated into traditional Native American crops. European settlers also introduced pigs to the region, which would later be used as a source of meat, cooking grease, and flavoring among all cultural groups (Green, 2013). During slavery, settlers who owned slaves occasionally had what was considered "slave food" prepared by house slaves who worked in the kitchen. One of the biggest factors in the integration of European and African foodways occurred as a result of the Civil War. Hunger conditions created by blockades from the North forced Confederate and Union soldiers fighting in the south to confiscate food from plantations. The resulting lack of supplies for the general public led whites in the area to eat what was once considered "black food" or "slave food" for risk of starvation. After the Civil War, poverty among blacks and whites led to a common cuisine—"poverty food," which today would be considered southern food (Miller, 2013).

Together, these three cultures created the southern meal pattern and its variations that exist throughout the South, including Cajun, French-Creole, Lowcountry haute cuisine, soul food, and plantation food (Green, 2013). These food patterns are still consumed to some degree in the U. S., despite changes in food production and the introduction of other ethnic cuisines into the U. S. A reason for this continuation of the southern food pattern is strongly tied to the relationship between food and social identity in the South. In a study done by Latshaw, she examined the relationship of residence, race, and regional identity on the consumption of southern foods (Latshaw, 2013). The

University of North Carolina's Southern Focus Polls (1991-2001) were used to obtain information on "regional residence, race, southern identity, food salience, and the consumption of southern foods," (pg. 105). From the 1995 polls, a series of foods that are highly representative of southern cuisine were isolated (e.g. okra, pork rinds, boiled peanuts, chitterlings), and arranged into a southern foodways scale ranging from no to high consumption of southern food.

From the study, clear attitudes and trends were distinguished among southerners and non-southerners. People who lived in the South were more likely to eat southern food often and less likely to report never eating southern food, compared to individuals in other regions of the U.S. As years living in the South increased, consumption of southern foods tended to increase. Individuals who claimed the identity of being a southerner were nearly four times more likely to eat Southern foods than those who did not claim that identity. Southern blacks and whites were more likely to have similar patterns of consuming southern foods, while Northern blacks were more likely to consume southern foods than Northern whites. Looking at other demographic information, individuals who were in the lower income bracket (<$10,000 per year) were more likely to eat southern food often and less likely to report never eating southern food than any other income bracket. Those who reported a lower education level were more likely to report eating southern food "sometimes" or "often." Overall, those who consumed more southern food were likely to state that food was very important to their cultural identity (Latshaw, 2013).

Despite evidence on the importance of southern food to cultural identity within the south, this unique foodway has never been carefully considered in developing

nutrition education curriculum for programs through EFNEP and SNAP-Ed targeted to low-income Americans in this region.

Rationale, Specific Aims, and Hypothesis

Understanding meal patterns of specific regions or cultural groups can help program developers encourage existing dietary behaviors or target areas for education. Georgians are a part of a unique southern foodway system that differs from the standard American diet in significant ways, so existing programs in Georgia may not meet all of the needs of its participants. The current SNAP-Ed Food Talk program from the University of Georgia does not examine the cultural foodways of its participants, thus analysis of specific meal patterns is needed.

This is an exploratory study to identify meal patterns of low-income adults participating in the SNAP-Ed Food Talk program in Georgia with a focus on adherence to southern meal patterns and preparation methods. The specific aim is to: Identify and describe the types of meal patterns consumed and degree of following southern meal patterns. Meal pattern will consider meal composition, types of foods consumed under four major food groups (i.e., fruits, vegetables, carbohydrates and grains, and protein groups), and southern food preparation methods. A southern meal pattern consists of traditional preparation methods and foods consumed and influenced by the intersecting cultures of Southeastern Native Americans (e.g. corn and corn products, beans, greens), Africans (e.g. okra, legumes, frying) and European colonial settlers (e.g. wheat-based products, pork, peaches, beef and dairy products).

CHAPTER III

METHODS

Study Design

This study is a secondary analysis of data from the University of Georgia SNAP-Ed Food Talk program collected in the FY2015. The Food Talk program is a direct nutrition education program taught by paraprofessionals in a classroom setting based on a culturally tailored curriculum founded on the Health Belief Model and the Dietary Approaches to Stop Hypertension diet. Food Talk curriculum was designed with the goal of decreasing dietary risk factors for hypertension by increasing self-efficacy and perceived benefits while decreasing barriers to improved fruit, vegetable, and dairy consumption and limiting sodium intake (Hanula, 2009). The cultural tailoring employed in the Food Talk program includes use of paraprofessionals (referred to as program assistants), evidential strategies (i.e., statistical facts on health issues relevant to the target population), and peripheral strategies (e.g., creating a fictional character within the curriculum representative of program participants).

The Food Talk program was evaluated using a pre-and post-test study design through a self-administered paper survey which included a behavioral checklist focusing on food resource management and food safety practices, a 24-hour dietary recall, and selected sociodemographic characteristics.

During the FY2015, the Food Talk program was provided in Fulton and Clarke counties, both of which are urban counties within Georgia. The Food Talk program

recruited participants who were aged ≥18 years, caregivers of children ≤17 years, and eligible for means-tested Federal assistance programs including SNAP, WIC, CACFP, TANF, or Head Start, or receiving services from public housing, food banks, food pantries, and free medical services. Participants enrolled in this SNAP-Ed program were not necessarily required to meet immigrant, employment, or resource requirements for eligibility that are in place for SNAP enrollment. In Fulton County, most of the participants were those who participated in Fulton Fresh Mobile Farmers Market providing access to fresh vegetables in low-income communities designated as food deserts. A total of 910 individuals participated in the Food Talk program in FY2015.

Written consent was obtained from those who wanted their Food Talk programming and evaluation data to be used for research. Only individuals who gave written informed consent were included in this study.

Dietary intake assessment

Dietary intake data were collected using two 24-hour dietary recalls at the first and last session of the Food Talk program, on the enrollment and exit form, respectively. Program assistants who taught the Food Talk program were trained to implement the 24-hr recalls. A script was provided to the program assistants that described how to instruct program participants through the food recall, based on a model developed by USDA called the five-step multiple-pass method (Conway, Ingwersen, & Moshfegh, 2004). The program assistants had posters and a food recall kit with food models to show in order to help participants work through the form. Participants self-reported intake data on forms, where they were prompted to list foods eaten, meal at which the food was eaten

(Breakfast, Morning Snack, Lunch, Afternoon Snack, Dinner, Night Snack), quantity of the food eaten, and additional details (e.g., preparation method, added condiments). Completed forms were checked by the program assistants, then by the supervising county extension agents before they were mailed to the University of Georgia SNAP-Ed State Office.

Meal Pattern Formatting

For the purpose of this study, meal patterns were defined through the construct of meal pattern formatting. Leech and colleagues defined the variables of meal pattern formatting to include analysis of meals through meal food type/combinations, meal food sequencing, and nutrient composition (Leech et al., 2015). Meal food type/combinations is defined as classifications of combinations of foods in meals. Meal food sequencing is the temporal distribution of consumption of food groups and intake of energy and nutrients within a meal. Nutrient composition is defined as the energy, protein, fat, and carbohydrate composition of a meal. For this study, we chose to analyze meal patterns using the variables of meal food type/combinations, to find cultural meal patterns and general meal composition among the participants. The meals chosen for analysis were breakfast and dinner, meals that are most likely to be prepared and consumed at home (Kearney, Hulshof, & Gibney, 2001).

Meals were first defined by distinguishing the main dish of the meal. The term "main dish" is defined using the current U.S. definition of an entrée, which is a substantial "made" meat or fish dish (Jurafsky, 2014). In meals that did not prominently feature meat, a main dish was defined as the most complex or substantive food within a meal. Other food items were classified as side dishes or as a beverage. Side dishes were

broadly classified as food groups (e.g., bread), then later specified into individual foods for analysis of cultural meal patterns.

Meal Patterns

Cultural meal patterns were classified by type of main dish, types of accompanying side dishes, and preparation methods of main dishes. To determine southern meal patterns, a chart of southern foods, dishes, and preparation methods commonly consumed or used in Georgia, as determined by existing literature, was created (**Table 1**) (Green, 2013; Harris, 2011; Latshaw, 2013; Miller, 2013; Shields, 2015). In the literature there were no texts dedicated solely to the presence of southern meal patterns in the state of Georgia, so **Table 1** was derived from books and articles about southern foodways that also mentioned foodways in Georgia. These foods and side dishes were chosen because of their general presence across the southern meal pattern (e.g., grits, catfish, and biscuits) and/or specific mention within the literature that they are consumed regularly as part of a traditional southern meal pattern in Georgia (e.g., peaches, lowcountry boil, and Brunswick stew).

This list is organized generally by how commonly many of these dishes were mentioned in the literature for southern food, and for foods that were specified to Georgia's history. Currently, there are no studies that look at the frequency of consumption of southern foods specifically in Georgia. Foods that were mentioned less in sources are towards the bottom for each category. Southern main dishes include foods like pork products (pork chops, pig's feet, etc.), chicken (fried), Brunswick stew, and catfish. Southern side dishes include individual foods, usually grain products or vegetables, traditionally eaten within the south and mixed dishes that have prominence in

traditional southern food culture (e.g., potato salad, macaroni and cheese). Certain preparation methods are identified as being central to traditional southern culture including frying, barbecuing, and boiling.

For the purpose of this study, total number of southern and not-southern foods, main dishes, and preparation methods within a meal were calculated, with the assumption that each food or main dish represented an equal (or near equal) proportion to the composition of the meal. If a majority of the foods or dishes consumed within a meal were from the southern meal pattern, then the meal was classified as being southern. If approximately half of the foods or dishes in a meal were southern, and the other half consisted of non-southern foods or dishes, then the meal was classified as a transition meal. If most foods or dishes present within a meal were not identified as being southern, then the overall meal was classified as being a not-southern meal. Not-southern meal patterns are defined as meals consisting mostly or completely of foods, dishes, and preparation methods that are not culturally significant to the general southern meal pattern. Not-southern items can include foods, dishes, and preparation methods that are ubiquitous in a general American diet (e.g., cereal, bread, chicken, bananas, braising), or foods, dishes, and preparation methods from international cuisines (e.g., sushi, tacos, tiramisu, tandoori cooking).

Table 1. Popular Southern Cuisine Consumed in Georgia

Foods			Dishes			Preparation
Protein	Vegetables/Fruits	Beverages	Main Dishes	Side dishes	Desserts	Preparation methods
Poultry Chicken gizzards Chitterlings Quail Turkey neck Eggs **Pork** Bacon Pork chop Pork ribs Pulled pork Ham Ham hocks Souse meat Pigs feet Fatback Pig's ears Hog jowl	Beans (lima, pole, white, green, pinto) Greens (collard, turnip, mustard, green) Okra Peas (black-eyed, crowder, purple hull, field) Yams/Sweet potatoes Pecans Peanuts Peaches Watermelon Squash Tomatoes (green) Corn Onions (Vidalia, green) Muscadine	Sweet tea Lemonade Other Sugar-sweetened beverages (e.g., soda)	**Mixed Mains** Chicken and dumplings Shrimp and grits Beans and rice Lowcountry boils Livermush Crab cakes Salmon croquettes Purloo Chicken and waffles Charleston red rice **Sandwiches** Pulled pork sandwich Barbecue sandwich Pimento cheese sandwich	Biscuits Grits Cole slaw Cornbread Rice Cornbread dressing Macaroni and cheese Mashed potatoes Potato salad Rice dressing Hash Chow chow Deviled eggs Hoppin' John Hoecake Hushpuppies Cornmeal mush Baked beans	Bread pudding Corn pudding Banana pudding Peanut brittle Butter pecan cake Caramel cake Hummingbird cake Strawberry shortcake Red velvet cake Pound cake Trifle Congealed salad Cobblers Pecan pie Sweet potato pie Tea cakes Moon pie Goo Goo cluster Peach shortcake Lane cake	Barbecue (pork, chicken, or beef) Frying (pork, chicken, turkey, fish and seafood, vegetables) Boiling (seafood, greens, peanuts) Sawmill or sausage gravy

Hog maw **Beef** Chicken fried steak Beef brisket Ox tails **Seafood** Catfish Shrimp **Game meat, Reptiles and Amphibians** Game (e.g. venison, rabbit, etc.) Game Fowl Alligator Frog legs	Carrots Elderberries Blueberries Huckleberries Blackberries Black raspberries Crabapple Red mulberry Fox grape Summer grape Persimmon		Peanut butter and banana sandwich **Soups/Stews** Brunswick stew Terrapin stew Frogmore stew She-crab soup Gumbo (okra soup)	Limpin' Susan Succotash Seven layer salad	Italian cream cake Divinity Pecan brittle Butter pecan cookies Moravian spice cookies Chess pie Lemon icebox pie Bourbon balls	

Foods and dishes included on this list were derived from those mentioned in literature about Southern foodways (Green, 2013; Harris, 2011; Latshaw, 2013; Miller, 2013; Shields, 2015)

Meal and Cultural Meal Pattern Analysis

Meal pattern analysis used data retrieved from the reported type of foods and dishes eaten at breakfast and dinner. Foods and dishes were manually coded into Microsoft Excel program denoting presence of a broad food item within a meal (e.g., meat, fruit, vegetables, bread), then a specific classification of the type of food consumed (e.g., banana or orange within the fruit category). For foods that had different methods of preparation specified (e.g., eggs, meats), the preparation method was also coded. Meals were then systematically reviewed, first by individual food or dish, then as an entire meal in order to be classified as southern, transition, or not-southern. First, the main dish of the meal was identified as well as preparation methods of the main dish if provided by the participant. Next, side dishes, desserts, and beverages were identified from the meal.

Foods, dishes, and preparation methods reported by the participants were then compared to those presented in **Table 1** to determine adherence to southern meal patterns. Other southern foods, dishes, or preparation methods that are not prominent in Georgia but identified in the existing literature as being southern (e.g., those from Cajun or French-Creole cuisines) were also categorized as southern. It was taken into consideration that participants within our sample may have southern foodways from other sub-regions within the U.S. south; this allowed us to be inclusive of the entire southern cuisine identified in literature about southern foodways. Each food, dish, and preparation method was then categorized as being southern or not according to the above criteria.

Meal composition analysis was done, and included number of sides (if any) and the presence of beverages that were consumed with the main dish or food. Side dishes were defined by their food group or major macronutrient using the following terms:

carbohydrate, vegetable, meat, fruit, protein (signifying a non-meat protein source), dairy (excluding milk), and beverages. To obtain the composition of a meal, recalls were first reviewed to find the main dish (as defined above), then reviewed again to classify other foods as sides by their food group or major macronutrient. Sides were listed under the names Sides 1-6 to count the number of sides present within a meal, and beverages were simply listed as present or not (number of beverages per meal were not calculated). Frequencies of particular meal composition patterns (e.g., chicken, carbohydrate, vegetable, and beverage) were calculated for both pre-program and post-program 24-hour recalls.

Analytic Sample

Of the original 910 University of Georgia SNAP-Ed Food Talk participants, 746 (82.0%) signed a consent form to allow their programming and evaluation data to be used for research. Participants were excluded from this analysis if they did not complete a 24-hour recall on both the entry and exit form (n=387, 42.5%), and did not indicate the time at which a food time was eaten on the 24-hour recall (n=27, 3.0%). The remaining analytic sample size was 332 participants. On the entry 24-hour recall forms at the beginning of the Food Talk program, 292 of the 332 participants reported consuming breakfast, and 235 participants reported consuming dinner. There were 205 participants who reported consuming both breakfast and dinner at program entry. On the exit forms, 291 of the 332 participants reported consuming breakfast, and 218 of 332 participants reported consuming dinner. There were 193 participants who reported consuming both breakfast and dinner upon program exit.

Data Analysis

Descriptive and exploratory analysis were used to identify meal patterns of the study sample with a focus on adherence to southern meal patterns and preparation methods. Descriptive statistics including mean, standard deviation, and frequency were calculated to describe the sociodemographic characteristics of the study sample. Frequency of main dishes and main foods by meal pattern were calculated, as well as frequencies of meal composition patterns. Participants were not matched for pre- and post-program intake, and reported values are based on overall reported dietary intake of the sample.

CHAPTER IV

RESULTS

Characteristics of study sample

The analytic sample included 332 SNAP-Ed Food Talk participants who met the criteria for this study. **Table 2** shows the characteristics of the study sample. In this study, the mean age of the participants was 56.6 ±20.6 years old, 81.7% of the participants were female, and 72.5% of participants were black. Most of the participants (77.3%) had obtained an education level of a high school diploma, GED, or some degree of higher education. The mean of household size was 2.2 ±1.7 persons per household, including children and other cohabitating adults. SNAP participation within this group was 34.0% of the participants; participation in SNAP is not a pre-requisite for SNAP-Ed eligibility, though SNAP participants are eligible to participate in SNAP-Ed programs. Characteristics of the included participants who were included in the meal pattern analysis for breakfast dinner are shown in **Table 3** and **Table 4.** Overall, characteristics of participants by the type of meal pattern were similar.

Table 2. Characteristics of SNAP-Ed Food Talk participants (n=332)

Characteristic	Total (n=332)
Age (years, mean ±SD)	56.6 ±20.6
Female (%)	81.7
Black (%)	72.5
Household size (mean ±SD)	2.2 ±1.7
Completed high school or GED (%)	77.3
SNAP participation (%)	34.0

Table 3. Characteristics of SNAP-Ed Food Talk Participants for Breakfast Meal Patterns

Characteristic	Southern		Transition		Not-Southern	
	Pre (n= 103)	Post (n=73)	Pre (n=2)	Post (n= 25)	Pre (n=187)	Post (n=193)
Age (years, mean ±SD)	56.8±21.7	60.2±24.5	49.5±16.3	65.3±22.0	58.2±24.5	56.0±23.4
Female (%)	80.6	72.6	100.0	96.0	80.2	80.8
Black (%)	71.8	71.2	50.0	60.0	56.1	60.6
Household size (mean ±SD)	2.4±1.8	2.1±1.6	3.0±2.8	2.2±1.6	2.0±1.6	2.1±1.7
Completed high school or GED (%)	68.0	69.9	50.0	60.0	68.4	73.6
SNAP participation (%)	37.9	26.0	50.0	24.0	29.4	33.7

Table 4. Characteristics of SNAP-Ed Food Talk Participants for Dinner Meal Patterns

Characteristic	Southern		Transition		Not-Southern	
	Pre (n=78)	Post (n=56)	Pre (n= 27)	Post (n=25)	Pre (n=130)	Post (n=139)
Age (years, mean ±SD)	54.5±22.7	58.8±23.0	51.4±20.1	63.6±15.1	55.9±24.3	52.3±24.1
Female (%)	80.8	78.6	88.9	80.0	76.9	81.3
Black (%)	71.8	91.3	48.2	68.0	62.3	54.7
Household size (mean ±SD)	2.2±1.5	2.1±1.4	2.4±1.7	1.6±1.2	2.3±1.7	2.3±1.8
Completed high school or GED (%)	75.6	73.2	85.2	76.0	78.5	77.0
SNAP participation (%)	37.2	30.4	25.9	40.0	36.9	33.1

Meal patterns of SNAP-Ed Food Talk participants

Cultural meal patterns of the University of Georgia SNAP-Ed Food Talk participants are presented in **Table 5**. Results are based on the number of participants who reported a meal at the eating occasions of breakfast or dinner on the 24-hour recall forms, and contain different participants in each data subset. On the enrollment 24-hour recall forms at the beginning of the Food Talk program, 292 of the 332 participants reported consuming breakfast, and 235 participants reported consuming dinner. Among the three types of cultural meal patterns created to represent the degree of adherence to southern meal patterns (i.e., southern, transition, and not-southern), a not-southern meal pattern was the most prevalent in breakfast and dinner at the beginning and the end of the Food Talk program. Not-southern meal patterns accounted for 64.0% of breakfasts and 55.3% of dinners at the beginning of the program. Southern meal patterns accounted for 35.3% of breakfasts, and 33.2% of dinners at the beginning of the Food Talk program, respectively.

Table 5. Meal Pattern of SNAP-Ed Food Talk Participants

		Southern	Transition	Not-Southern
Breakfast	Pre-Program (n=292)	103 (35.3%)	2 (<1%)	187 (64.0%)
	Post-Program (n=291)	73 (25.1%)	25 (8.6%)	193 (66.3%)
Dinner	Pre-Program (n=235)	78 (33.2%)	27 (11.5%)	130 (55.3%)
	Post-Program (n=218)	56 (25.7%)	25 (11.5%)	139 (63.4%)

At the end of the Food Talk program, 291 of the 332 participants reported consuming breakfast, and 218 of 332 participants reported consuming dinner. Of these participants, not-southern meal patterns accounted for 66.3% of breakfasts and 63.4% of dinners. Transition meal patterns were reported more frequently at the end of the program, accounting for an initial <1% of meals at the beginning of the program to 8.6% of meals at the end. Prevalence of transition meals in dinner was stable through the program, with 11.5% of participants having a transition pattern at the beginning of the Food Talk program, and 11.4% of participants having that meal pattern at the end.

Frequency of main foods and main dishes

The main dish or food was evaluated for southern, transition, and not-southern meal patterns for breakfast and dinner. The frequency of main foods and main dishes for breakfast are shown in **Table 6**. At the beginning of the Food Talk program, the most frequently consumed main dish or food was cereal for both the not-southern and transition meal patterns (28.3% and 100%, respectively), and eggs for the southern meal pattern (52.4%). At the end of the program, cereal was the most frequently consumed main dish/food item for the not-southern meal pattern (26.4%), and eggs was the most frequently consumed main food for the southern meal pattern (58.9%), while the most frequent main dish for transition meals was a sandwich (36.0%).

Table 7 shows the frequency of main dishes and foods consumed during dinner. At the beginning of the Food Talk program, the most frequent main dish or food for a non-southern meal pattern at dinner was a sandwich (21.5%), while chicken accounted for the most frequently consumed main food for both the southern and transition meal patterns (38.5% and 40.7%, respectively). At the end of the Food Talk program,

sandwiches were the most reported main dish (20.1%) of not-southern dinners, and chicken was the main food for southern and transition meal patterns (41.1% and 40.0%, respectively).

Table 6. Frequency of Main Foods and Main Dishes in Breakfast by Meal Pattern among SNAP-Ed Food Talk Participants

Main Dish/Food	Total		Southern		Transition		Not-southern	
	Pre-Program (n=292)	Post-Program (n=291)	Pre-Program (n=103)	Post-Program (n=73)	Pre-Program (n=2)	Post-Program (n=25)	Pre-Program (n=187)	Post-Program (n=193)
Eggs	72 (24.8%)	56 (19.2%)	54 (52.4%)	43 (58.9%)	0	6 (24.0%)	18 (9.6%)	7 (3.6%)
Grits	14 (4.8%)	13 (4.5%)	12 (11.7%)	10 (13.7%)	0	2 (8.0%)	2 (1.1%)	1 (<1%
Cereal	57 (19.7%)	52 (17.9%)	2 (1.9%)	0	2 (100%)	1 (4.0%)	53 (28.3%)	51 (26.4%)
Oatmeal	29 (10%)	42 (14.4%)	1 (1%)	0	0	3 (12.0%)	28 (15.0%)	39 (20.2%)
Pancakes or Waffles	10 (3.4%)	7 (2.4%)	5 (4.9%)	0	0	2 (8.0%)	5 (2.7%)	5 (32.6%)
Meat	17 (5.9%)	9 (3.1%)	16 (15.5%)	7 (9.6%)	0	0	1 (<1%)	3 (1.6%)
Toast	9 (3.1%)	8 (2.7%)	0	0	0	0	9 (4.8%)	8 (4.1%)
Sandwich	27 (9.3%)	30 (10.3%)	13 (12.6%)	13 (17.8 %)	0	9 (36.0%)	14 (7.5%)	8 (4.1%)
Pastry	10 (3.4%)	13 (4.5%)	0	0	0	0	10 (5.3%)	13 (6.7%)
Other*	31 (10.7%)	38 (13.1%)	0	0	0	0	31 (16.6%)	37 (19.2%)
French Toast	3 (1%)	0	0	0	0	0	3 (1.6%)	0
Bagel	6 (2.1%)	6 (2.1%)	0	0	0	1 (4.0%)	6 (3.2%)	5 (2.6%)
Fruit	7 (2.4%)	17 (5.8%)	0	0	0	1 (4.0%)	7 (3.7%)	16 (8.3%)
Total	100%	100%	100%	100%	100%	100%	100%	100%

Frequency percentages are calculated based on frequency of a main dish or food within a meal pattern by time period (pre- or post-program), and should be read by column.

*Other in breakfast denotes foods that are atypical for breakfast intake, did not have adequate information to categorize, or were difficult to place into one broad category

Table 7. Frequency of Main Foods and Main Dishes in Dinner by Meal Pattern among SNAP-Ed Food Talk Participants

Main Dish/Food	Total		Southern		Transition		Non-southern	
	Pre-Program (n=235)	Post-Program (n=218)	Pre-Program (n=78)	Post-Program (n=56)	Pre-Program (n=27)	Post-Program (n=25)	Pre-Program (n= 130)	Post-Program (n=139)
Chicken	59 (25.1%)	55 (25.2%)	30 (38.5%)	23 (41.1%)	11 (40.7%)	10 (40.0%)	18 (13.8%)	22 (15.8%)
Pork	22 (9.4%)	14 (6.4%)	16 (20.5)	12 (21.4%)	4 (14.8%)	2 (8.0%)	2 (1.5%)	0
Beef	18 (7.7%)	12 (5.95	4 (5.1%)	1 (1.8%)	3 (11.1%)	5 (20.0%)	11 (8.5%)	6 (4.6%)
Seafood	15 (6.4%)	7 (3.2%)	8 (10.3%)	1 (1.8%)	1 (3.7%)	2 (8.0%)	6 (4.6%)	4 (2.9%)
Turkey	5 (2.1%)	3 (1.4%)	1 (1.3%)	2 (3.6%)	2 (7.4%)	1 (4.0%)	2 (1.5%)	0
Sandwich	34 (14.5%)	33 (15.1%)	5 (6.4%)	3 (5.4%)	1 (3.7%)	2 (8.0%)	28 (21.5%)	28 (20.1%)
Soup/Stew	12 (5.1%)	9 (4.1%)	2 (2.6)	1 (1.8%)	1 (3.7%)	0	9 (6.9%)	8 (5.8%)
Breakfast food	3 (1.3%)	2 (1.0%)	0	0	0	0	3 (2.3%)	2 (1.4%)
Pasta	15 (6.4%)	21 (9.6%)	0	0	0	0	15 (11.5%)	21 (15.1%)
Pizza	5 (2.1%)	7 (3.2%)	0	0	0	0	5 (3.8%)	7 (5%)
Taco/Nacho	3 (1.3%)	1 (<1%)	0	0	0	0	3 (2.3%)	1 (<1%)
Salad/Vegetables	16 (6.8%)	30 (13.7%)	8 (10.3%)	7 (12.5%)	2 (7.4%)	2 (8.0%)	6 (4.6%)	21 (15.1%)
Other*	28 (11.9%)	25 (11.5%)	4 (5.2%)	6 (10.7%)	2 (7.4%)	1 (4.0%)	22 (16.9%)	18 (12.9%)
Total	100%	100%	100%	100%	100%	100%	100%	100%

Frequency percentages are calculated based on frequency of a main dish or food within a meal pattern by time period (pre- or post-program), and should be read by column.

*Other in dinner denotes foods that were consumed rarely, atypical for dinner intake, did not have adequate information to categorize, or were difficult to place into one broad category

In addition to the classification of meal pattern by main dish and cultural relevancy to the south, composition of meals was also examined. **Table 8** presents the most frequently reported meal compositions for breakfast at the beginning and end of the Food Talk program. At the beginning of Food Talk, the most common meal compositions had a main dish or food of cereal, eggs, a sandwich, oatmeal, or meat; most common meals had one side, and nearly half of the meal compositions included a beverage of some sort. Three of the top meal compositions (including the most frequently consumed meal composition) had cereal as a main dish, and meals that had eggs as a main dish accounted for four of the other meal patterns. After the Food Talk program, there were some differences in meal composition. The main dish or food of these meal composition included cereal, eggs, a sandwich, a pastry, and oatmeal. Most of the popular meal composition did not include a side dish, and nearly half included a beverage. Overall, the meal composition of "cereal and a beverage" was the most frequently consumed.

Table 8. Most Frequently Consumed Meal Composition Patterns in Breakfast among SNAP-Ed Food Talk Participants

	Pre-Program (n=292)					Post-Program (n=291)			
Main Dish or Food	Side 1	Side 2	Beverage Present	Frequency	Main Dish or Food	Side 1	Side2	Beverage Present	Frequency
Cereal			Yes	21	Cereal			Yes	17
Eggs	Carbohydrate	Fruit	No	17	Cereal			No	14
Cereal	Fruit		Yes	15	Egg	Carbohydrate	Meat	No	13
Sandwich			No	13	Sandwich			No	10
Eggs	Carbohydrate		No	12	Egg	Carbohydrate		No	9
Eggs	Carbohydrate	Meat	No	10	Pastry			No	9
Oatmeal			No	9	Egg			Yes	8
Eggs	Carbohydrate		Yes	7	Oatmeal			No	8
Cereal			No	7	Oatmeal			Yes	7
Meat	Carbohydrate		Yes	7	Cereal			Yes	6

Foods within the side “Carbohydrates” include grits, breads (of all sorts), grain-based snacks, granola, and other foods or dishes that feature carbohydrates as a main macronutrient.

Table 9. Most Frequently Consumed Meal Composition Patterns in Dinner among SNAP-Ed Food Talk Participants

Pre-Program (n=235)					Post-Program (n=218)				
Main Dish or Food	Side 1	Side 2	Beverage Present	Frequency	Main Dish or Food	Side 1	Side2	Beverage Present	Frequency
Chicken	Carbohydrate	Vegetable	No	19	Sandwich			No	15
Sandwich			No	15	Chicken	Carbohydrate	Vegetable	No	12
Chicken	Vegetable		No	11	Chicken	Carbohydrate	Vegetable	Yes	8
Pork	Vegetable		No	10	Chicken	Vegetable		No	8
Chicken			No	8	Chicken	Carbohydrate		No	6
Vegetable			No	8	Vegetable			No	6
Beef	Vegetable		No	7	Vegetable			Yes	6
Chicken	Vegetable		Yes	6	Vegetable	Carbohydrate		Yes	6
Chicken	Carbohydrate		No	5	Pork	Vegetable		No	5
Sandwich	Vegetable		Yes	5	Seafood	Vegetable		No	4

Food items under the main dish "Vegetable" include salads, beans, vegetable mixed dishes (e.g., potato salad), or other vegetables that were eaten in a meal without another category of main dish or food eaten.

Food items under the side "Carbohydrate" include rice and rice dishes, breads, pasta, and grain-based desserts.

Table 9 details the most frequently reported meal composition patterns for dinner at the beginning and end of the Food Talk program. The main dishes or foods in the most frequently reported meal compositions included chicken, sandwiches, pork, vegetables, and beef. Most of the meals were composed of a main and one side, with two of the top ten meal compositions containing a beverage. After the Food Talk program, the types of main dishes or foods in the most frequently reported meal compositions included sandwiches, chicken, vegetables, pork, and seafood. Most of the meal compositions included at least one side, and three of the common meal composition included a beverage. The most frequently reported meal composition among Food Talk participants changed from "chicken, carbohydrate, and vegetable" to a "sandwich" between the beginning and end of the program, though the "chicken, carbohydrate, and vegetable" meal remained the second most frequent meal composition.

Southern preparation methods

Southern preparation methods were evaluated in the analysis of meal patterns and are detailed in **Table 10**. Because the reported preparation methods were very low, frequencies were combined for the southern, transition, and not-southern meal patterns. For breakfast, southern preparation methods consisted of frying and boiling. At the beginning of the Food Talk program, using these methods were reported in 2.7% of meals, and in 3.1% of meals after the program. Southern preparation methods in dinner consisted of frying and barbequing. At the beginning of the Food Talk program, these methods were used in 7.7% of meals, and in 6.4% of meals after the program. Overall, frying was the most reported southern preparation method in all meals.

Table 10. Inclusion of Southern Preparation Methods in Breakfast and Dinner in the Study Sample

	Breakfast		Dinner	
	Post-Program (n=292)	Post-Program (n=291)	Post-Program (n=235)	Post-Program (n=218)
Frying	5 (1.7%)	1 (<1%)	15 (6.4%)	11 (5.0%)
Barbequing	0	0	3 (1.3%)	3 (1.4%)
Boiling	3 (1.0%)	6 (2.1%)	0	0
Total	8 (2.7%)	7 (3.1%)	18 (7.7%)	14 (6.4%)

CHAPTER V

DISCUSSION/CONCLUSIONS

The purpose of this study was to identify and describe the types of meal patterns consumed and degree of following southern meal patterns among The University of Georgia SNAP-Ed Food Talk participants. The findings from this study show that about a third of participants follow a southern meal pattern for breakfast, and a quarter of participants follow a southern meal pattern for dinner, and suggest that meal pattern formatting data, beyond nutrient intake has a potential to provide valuable information on unique cultural meal pattern and preference of the target population. Within the context of this study, meal pattern formatting allows us to see general trends in intake for main dishes and foods, cultural food patterns, and the composition of individual meals. This exploratory study may serve as a reference for the development of culturally appropriate nutrition education curriculum for SNAP-Ed participants in Georgia.

From this study, it was found that a majority of Food Talk participants who reported consuming breakfast or dinner consumed a meal that followed a not-southern meal pattern. Southern meal patterns accounted for 35.3% of breakfasts and 33.2% of dinners at the beginning of the Food Talk program, and 25.1% of breakfasts and 25.7% of dinners at the end of the program. For breakfast, cereal or eggs were the most frequently consumed main dish or food reported among the three identified meal pattern at the beginning of the Food Talk program. After the Food Talk program, cereal, eggs, and

sandwiches were the most frequently consumed main dishes or foods consumed in the meal patterns. Among those who had a southern meal pattern, eggs, grits, meat, and sandwiches (usually in the form of biscuit sandwiches) were the most frequently consumed main foods or dishes. For dinner, at the entry and exit of the program, sandwiches or chicken were the most frequently consumed main dish or food among participants among the three meal patterns. Among those whose dinners followed a southern meal pattern, chicken, pork, seafood, and vegetables were the most frequently consumed main meals or dishes. The most frequently reported meal compositions for both breakfast and dinner typically consisted of a main food or dish with one to two sides, with most patterns not including a beverage. Preparation methods were not frequently reported on participant recalls, and very few participants reported southern preparation methods for their meals.

To determine meal patterns for each participant, classification based on main dish or food, as well as meal composition were determined. Classification of breakfast meal patterns as southern, transition, or not-southern were easier to define when compared to dinner meal patterns. In breakfast, there are distinct food items that are southern regardless of preparation method (e.g. grits, biscuit, biscuit gravy), and types of foods tended to cluster together (e.g. cereal and fruit, eggs and grits) which made the delineation of meals simpler. Dinner proved to be more difficult to categorize into food patterns because of the variety of foods and dishes that were present, and a lack of preparation methods reported on recalls made some meals difficult to analyze.

Comparison of methods to determine meal patterns

In the literature, most studies chose to analyze meal pattern formatting by factor analysis, a statistical method that estimates the principle components of meals based on food group intake. One study by Judd and colleagues identified dietary patterns among participants in the REasons for Geographic And Racial Differences in Stroke (REGARDS) study based on the quantity of 107 individual foods from the Block 98 food frequency questionnaire (Judd, Letter, Shikany, Roth, & Newby, 2014). They identified five dietary patterns based on the foods that contributed the most to each pattern, which included alcohol/salad, convenient, southern, healthy, sweets/fats, then adherence scores were given to each participant. One of the factors loaded heavily on added fats, eggs, fried food, organ meats, processed meats, and sugar-sweetened beverages; the resulting pattern was named the "southern" pattern.

Colón-Ramos and colleagues also used exploratory factor analysis to gain an understanding of the associations between dietary patterns during pregnancy and birth size measures among individuals in the Conditions Affecting Neurocognitive Development and Learning in Early Childhood (CANDLE) cohort (Colon-Ramos et al., 2015). Dietary intake data was from the Block 2005 FFQ, and factor analysis with principal component extraction and varimax rotation (to help explain variances within each factor) to create seven dietary patterns. Characterization of a southern dietary pattern was much broader than other studies, including cooked cereals, peaches, corn, fried fish, beans, greens, pig's feet, neck bones, oxtails, tongue, and pork. Other dietary patterns included healthy (high factor loadings of fruits and vegetables, non-fried fish and

chicken, and water), processed (processed meat, fast food, snacks, sweets, and soft drinks), healthy-processed, healthy-southern, southern-processed, and mixed.

This study used proportion methods to determine if a meal followed a southern, transition, or not-southern meal pattern. By assuming that each individual food or dish contributed an equal (or near equal) amount to a meal, we were able to determine the contributions of southern foods and dishes were enough to put into a certain meal pattern. Our study also differed from some other studies in the literature in that we did not classify southern meal patterns only by the presence of foods like sugar-sweetened beverages, processed meats, and fatty or fried foods. Instead, southern meal patterns were determined by the inclusion of certain foods across all food groups. Research on the sociocultural, agricultural and historical perspectives of southern foods includes fruit and vegetable intake, certain grains, and preparation methods other than frying, so it was important to include those to reduce the risk of a superficial examination of dietary patterns. Though there was some scripted guidance of a validated tool used to obtain 24-hour recalls (USDA five-step multiple-pass method), the quality of the data could not be controlled for this secondary analysis. Our study benefitted by manually going through each 24-hour recall because this method allowed for meals to be analyzed within their cultural context. This method of manually analyzing recalls for proportions of food items may not be feasible for other SNAP-Ed programs to implement because of the time needed to analyze each recall, so factor analysis may be a better choice for larger groups of participants.

Uniqueness of the meal pattern analysis in SNAP-Ed Food Talk participants

The meal pattern analysis of the University of Georgia SNAP-Ed Food Talk participants is unique in several aspects. In the literature, there are currently no studies from SNAP-Ed or EFNEP programs examining meal patterns or dietary intake by meal pattern formatting. This type of meal pattern analysis allows for researchers to identify major foods and dishes consumed by meal and monitor changes in intake over the course of a program. Therefore, by focusing on specific meals, nutrition education curriculum developers may be able to better identify program impact on dietary changes in individuals who participate in these programs, as well as areas to target for education.

This study is also unique in that attention to regional foodways among participants in SNAP-Ed or EFNEP programs as a way to develop cultural competency which has not been seen in the existing literature. Developing cultural competency within these programs have traditionally focused on strategies including the use of paraprofessionals, evidential strategies (i.e., statistical facts on health issues relevant to the target population), and peripheral strategies (e.g., creating a fictional character within the curriculum representative of program participants). This study provides insight into another aspect of cultural tailoring that can be useful to incorporate into nutrition education curricula.

This study is also unique in that it provides a new perspective on the classification of southern meal patterns in nutrition studies. Traditionally, southern meal patterns are primarily classified by presence of sugar-sweetened beverages and fried or processed meats. When classifying dinners as southern in the context of this study, a large degree of meal pattern classification was dependent on the vegetable-based and grain-based side

dishes that were present within a meal. In other studies, vegetable intake was attributed to other types of meal patterns without cultural consideration of specific types of vegetables eaten in southern meal patterns. As a result, there is a possibility that traditional classifications of southern meal patterns can be biased and artificially lower the diet quality measures of this eating pattern.

It is important that researchers examine southern meal patterns within the context of all components of a meal, including traditional fruits and vegetables, as well as other side dishes. This type of analysis can be applied to the cultural appropriateness of health behavior area of the PEN-3 model—which includes positive behaviors, existential behaviors, and negative behaviors—when developing nutrition education curriculum for populations within this regional foodway. In this population, certain dietary behaviors such as consuming leafy greens, okra, and peas are positive, consuming white rice can be considered existential, and the consumption of fried foods or region-specific pork products like souse meat can be seen as negative.

Strengths

This exploratory study on meal patterns in SNAP-Ed participants has many strengths. To our knowledge, this is the first and only study examining meal patterns of SNAP-Ed participants through the use of meal formatting methods in the U.S. Other studies examined either overall diet quality through an index, reported nutrition and health behaviors, or intent to change nutrition and health behaviors. These types of evaluations are inadequate to determine specific and actual changes in dietary behaviors by meal. Classifying meals not solely on the main dish or food item, but in addition considering side dishes, beverages, and desserts was also a strength of this study. This

type of analysis could have captured certain meal patterns that would not have been classified correctly if analysis had only focused on main dishes and food items. Extensive research on the history of southern meal patterns in the U.S. was done to ensure that classification methods of meal patterns were as accurate as possible. Many studies only focus on a few foods when classifying dietary patterns, especially when classifying meals as southern, which could introduce bias into analysis. From this study, we found that there was a portion of participants who follow southern meal patterns (either through southern or transition meal patterns), and may have unique nutrition education needs. Therefore, these strengths show that this type of meal pattern analysis can contribute to developing culturally appropriate nutrition education programs and understanding the types of meal patterns present within participants of the SNAP-Ed program in Georgia.

Limitations

Although this study has many unique strengths, it has several limitations that need to be considered. This exploratory study was conducted in a small convenience sample of SNAP-Ed participants in the urban counties of Fulton and Clarke, therefore results may not be generalizable to rural counties in Georgia or other states that are considered to be a part of the U.S. South. Further studies are warranted with a larger sample of participants who represent both urban and rural counties, and are representative of region-specific foodways in different states. Another limitation of this study was that meal pattern analysis was based on 24-hour recalls. Because daily intake is variable, reported intake on pre- and post-program forms may not be representative of usual intake and meal patterns. In addition, this study used self-reported pre- and post-program 24-hour recalls to obtain dietary data. Some participants did not fill in all preparation methods and details

of foods, therefore limiting analysis of food preparation methods and possible adherence to southern meal patterns. To address this, more direction on how to fill out a 24-hour recall and emphasis on completing all sections of the recalls can improve the quality of data.

This study was also limited because of reliance on secondary data. Data collection for the original study was not focused on identification of meal patterns, so the quality of information needed for this type of analysis was not always present. If a similar study were to be conducted, primary data collection through interviewer-led 24-hour recalls should be done to improve data quality. Another limitation is that although literature on the history of southern foods was used to find commonly consumed traditional southern foods, there is a possibility that some foods were omitted from our southern food list. Our analysis did not match participants for pre- and post-program meal patterns, so we were only able to see overall meal patterns instead of within-person changes in meal patterns. In a future study, matching meal patterns among participants should be done. This would allow for researchers to discover what changes in meal patterns have occurred and measure the impact of the program in participants. A potential weakness is the use of proportions instead of factor analysis to determine meal patterns. Factor analysis is a more statistically rigorous method of determining meal patterns, but given the quality of the dataset for this study and the emphasis for cultural context of each meal, it was decided to be the best method to determine meal patterns.

The reliability of our data was also challenged through this study. There were several factors that may have had an impact on the reliability of data including participant education level, lack of time to complete forms, distraction within the environment in

which classes were held, and potential lack of understanding of instructions by participants. There are also some potential limitations in the validity of our study. Participant meal patterns were coded based on foods, dishes, and preparation methods while looking at them through the lens of southern meal patterns. Several foods that are considered southern could also have prominence in other regional foodways (e.g., rice is prominent in southern, African, Asian, and Latin American cultures). A researcher without a clear understanding of southern foodways and southern meal patterns may categorize foods as not-southern because of a lack of cultural context, which is vital for this study.

Implications

This study has several implications for the development of nutrition education and understanding meal patterns within individuals. Our data show that for breakfast and dinner, a large proportion of our sample follows southern meal patterns to some degree. Therefore, it may be useful to incorporate recipes and cooking demonstrations that showcase healthy southern foods when developing future nutrition education curriculum for this population. In addition, bringing attention to certain foods and dishes consumed within the southern meal pattern and the potential effects on health can also be added to existing curriculum. To strengthen quality of dietary data collection, there are a few methods that could be employed. First, additional training for program assistants to answer questions or reinforce important steps of doing a 24-hour recall could be helpful to increase the reliability of data collected from future SNAP-Ed Food Talk program participants. Allowing participants more time to complete forms could increase details provided on dietary recalls, and decrease the likelihood of omitting meals from recall.

Another method to strengthen dietary data collection would be by creating an environment within the class location in which participants are not distracted by each other or other factors while filling out forms (could be done by spacing out participants around the room, providing folders to remove visual distractions, etc.).

In future studies, researchers should analyze how components of meals relate to MyPlate and which areas in which different meal patterns follow MyPlate by meal. Data analysis of meal patterns by other SNAP-Ed or EFNEP programs should include meal pattern formatting to find changes in dietary intake that dietary indices may not be able to capture. Future curriculum development of federally funded nutrition education programs targeted towards low-income adults should also take steps in modifying curricula to be culturally appropriate for specific foodways. To do this, research on foodways, meal pattern analysis, like the one conducted in this study, and interviews or studies with community members should be done to assess intake and nutrition education needs of potential SNAP-Ed program participants.

Georgians are a part of the regional foodways of the U.S. South and may have unique nutrition education needs that are not being met through current federally funded nutrition education programs. This exploratory study may serve as a reference for the development of effective culturally appropriate nutrition education curriculum for SNAP-Ed participants in Georgia.

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