Benefits, Barriers, Attitudes, and Beliefs about Soy Meat-alternatives among African American Parishioners Living in Eastern North Carolina

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The goal of this study was to assess benefits, barriers, attitude, and beliefs about nutrient content and health effects, and sensory analysis of soy meat-alternatives among 40 African Americans, mean (SD) aged 54 (10), 78% of whom were females, participating in a faith-based nutrition program. Perceived benefits received higher scores than perceived barriers to eat soy meat-alternatives. Beliefs about nutrient content and health effects of consuming soy meat-alternatives were consistent with the scientific findings. The results indicate that soy meat-alternatives may be considered viable options to include in a diet of some African Americans. (*Ethn Dis*. 2010;20:118–122)

Key Words: Soy, Meat-Alternatives, African American, Diet, Nutrition

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Introduction

Compared to Caucasians, African Americans living in North Carolina have higher age-adjusted death rates from all leading causes of death (eg, heart disease, cancer, stroke, diabetes), with the exception of pneumonia/influenza.[1] Diet is one of the most important factors in prevention and development of these health conditions. Although the traditional cuisine of African Americans in the southern United States, referred to as soul food, contains many nutritious foods, including collards, okra, rice, legumes, and sweet potatoes, this diet is high in saturated fat from lard, other animal fat, and a variety of high fat meats, especially pork. In fact, according to one recently published study, African Americans living in North Carolina consumed almost 50% of calories from fat.[2]

In contrast, soybeans and soy products are associated with a reduced risk of chronic health conditions. Anderson, et al published a meta-analysis of 38 controlled clinical trials that assessed impact of soy protein on serum lipids. Statistically significant decreases in lipid parameters, including total cholesterol (−9%), LDL (−13%), and triglycerides (−11%) were found between the experimental and control groups, even though the intake of dietary total fat, saturated fat, and cholesterol were similar between the groups.[3] In another meta-analysis, Zhan and Hu assessed the effect of soy protein containing, on the average, 80 mg/d of isoflavones, on lipid profiles in 23 published studies and reported similar findings, including significant decreases in total cholesterol (−4%), LDL (−5%), and triglycerides (−7%), and increase in HDL (3%).[4]

The goal of this study was to assess benefits, barriers, attitude, and beliefs about nutrient content and health effects, and sensory analysis of soy products as meat-alternatives and assess perceived future intake of these meat-alternatives.

Some of the products made of soybeans and textured soybean protein have been labeled meat-alternatives. Soy meat-alternatives, also called meat analog, meat substitute, mock meat, or imitation meat are designed to look, smell, and taste like their meat counterparts. Meat analogs were first introduced in the 19th century by Dr. John H. Kellogg at the Battle Creek Sanatorium in Michigan.[5] Soy meat-alternatives made of textured soy protein became popular in the 1960s as a meat substitute for vegetarians. In 1999, the Food and Drug Administration approved labeling foods containing at least 6.25g of soy protein per serving as protective against heart disease.[6] Soy meat-alternatives are considered functional food because they have health-promoting properties.

The goal of this study was to assess benefits, barriers (decisional balance), attitude, and beliefs about nutrient content and health effects, and sensory analysis (taste/flavor, smell/aroma, and juiciness/tenderness) of soy products as meat alternatives and assess perceived

future intake of these meat-alternatives. The population of interest included members of two African American churches in eastern North Carolina.

METHODS

Setting and Sample

Data were collected from a convenience sample of African Americans who were members of two churches located in Edgecombe and Pitt counties in eastern North Carolina. Participants were recruited among members who participated in a faith-based nutrition intervention program.

Survey

The survey used for this study was developed by three registered dietitians and included statements that assessed decisional balance (benefits and barriers), attitude, and beliefs about nutrient content and health effects. Additionally, sensory analysis (taste/flavor, smell/aroma, and juiciness/tenderness) questions/statements regarding soy meat-alternatives were included. The decisional balance and attitude statements were rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The beliefs about nutrient content and health benefits included true, false, or I don't know responses. The sensory analysis scale was rated on a 5-point Likert scale from 1 (strongly do not like) to 5 (strongly like). Cronbach alpha reliability values were 0.949 benefits, 0.777 for barriers, 0.694 for attitude, and 0.743 for beliefs.

The survey also included two questions to assess perceived future intake of soy meat-alternatives: "How likely would you consider eating soy meat-alternatives on a regular basis?" and "How likely would you replace eating meat with soy meat-alternatives?" Both of these questions were rated on a 11-point Likert scale from 0 (not being very likely) to 10 (very likely). Demographic and socioeconomic data were also collected.

Data collection

The study protocol was approved by the institutional review board at East Carolina University. Prior to data collection, participants attended a one-hour lecture about soy meat-alternatives. This lecture was conducted by a registered dietitian. Lecture content included information about nutrient content, health benefits, and methods of preparation of soy meat-alternatives. During this lecture, the registered dietitian conducted a cooking demonstration using Morningstar Farms Chik'n Nuggets. Participants had the opportunity to taste this product. Participants were than asked to purchase three soy meat-alternatives made by Morningstar Farms, including Chik'n Nuggets, Veggie Dogs, and Spicy Black Bean Veggie Burgers from local grocery stores, and prepare them in place of the meat counterparts in their home. Participants were shown pictures of the soy meat-alternative packages that they were asked to purchase and received directions where these items were located in their local grocery stores. Participants were instructed to prepare these products the way they would normally prepare the meat counterparts (eg, fried, grilled). Participants were offered reimbursement for the cost of the soy meat-alternatives and an additional $5 as an incentive to complete the survey instrument, which they completed at home after they ate the selected products. Reimbursement was issued upon receiving a receipt of purchase of the soy meat-alternative items and the completed survey.

RESULTS

From the 82 members invited to participate, 45 completed the study (54.9%). Five surveys were excluded from analysis because they contained many blank statements. Thus, the analyses are based on 40 collected surveys (48.8% of those requested to participate).

Demographics

The mean (SD) age of participants was 54 (10) with a range of 32 to 73 years. Most participants were females (78%), 61% had an annual income below $35,000. Forty-two percent had completed high school or GED, 55% had some college education or were college graduates.

Findings

From the benefits statements, "Eating soy meat-alternatives would help me to eat more dietary fiber," and "Eating soy meat-alternatives would help me get more nutrients" received the highest mean scores (3.43 and 3.40, respectively, Table 1), while "I would eat soy meat-alternatives if they were available in grocery stores where I go shopping" received the highest mean score (3.18) from the barrier statements (Table 1). Attitudinal statements with negative connotations were scored lower than those with positive connotations with "I should eat soy meat-alternatives because soy meat-alternatives are healthy" statement receiving the highest score from all attitudinal statements (3.10; see Table 1).

Overall, beliefs about nutrient content and health effects of consuming soy meat-alternatives were consistent with the scientific findings (see Table 2). For example, the majority of participants (92.5%) reported that soy meat-alternatives can lower blood cholesterol level, lower risk for heart attack (90%) and diabetes (85%).

The Chik'n Nuggets received the highest scores for all three sensory analyses while the Veggie Dogs received the lowest (Table 3). The mean score for the "How likely would you consider eating soy meat-alternatives on a regular basis?" statement was 6.03. Similarly, the mean score for the "How likely would you replace eating meat with soy meat-alternatives?" statement was 5.65 (data not shown).

DISCUSSION

In the past, the church has been widely used as a venue for the delivery

Table 1. Mean scores for statements within attitude, benefits and barriers

	Mean scores
Attitudinal statements	
I should not eat soy meat-alternatives because they are high in fat	2.75
I should not eat soy meat-alternatives because they are high in salt	2.68
I should not eat soy meat-alternatives because they would cause my cholesterol to increase	2.58
I should not eat soy meat-alternatives because I would gain weight	2.53
I should not eat soy meat-alternatives because they cause allergies	2.43
I should eat soy meat-alternatives because soy meat-alternatives are healthy	3.10
I should eat soy meat-alternatives because they are high in protein	2.95
Benefits statements	
Eating soy meat-alternatives would help me feel better	3.08
Eating soy meat-alternatives would help me to take better care of my body	3.23
Eating soy meat-alternatives would help me get more nutrients	3.40
Eating soy meat-alternatives would help me be healthier	3.30
Eating soy meat-alternatives would give me the energy I need	3.25
Eating soy meat-alternatives would help me to eat more dietary fiber	3.43
Eating soy meat-alternatives would help me to look younger	2.88
Eating soy meat-alternatives would be consistent with the advice of my doctor	3.35
Eating soy meat-alternatives would help me to reduce my intake of fat	3.00
Eating soy meat-alternatives would help me to reduce my intake of calories	3.18
Barrier statements	
Soy meat-alternatives are too expensive	2.58
Soy meat-alternatives do not taste good	2.38
It takes too long to prepare soy meat-alternatives	2.10
Soy meat-alternatives are not salty enough	2.23
Soy meat-alternatives are too low in fat	2.35
Soy meat-alternatives do not satisfy my cravings	2.58
I do not know how to prepare soy meat-alternatives	2.08
I do not know where to find soy meat-alternatives in a grocery store	2.18
My children would not like soy meat-alternatives	2.78
My significant other would not like to eat soy meat-alternatives	2.48

1=strongly disagree, 2=moderately disagree, 3=neither disagree nor agree, 4=moderately agree, and 5=strongly agree.

of health information, health screening and dietary intervention among African Americans. For example, a faith-based program implemented in 14 churches in Bronx, New York was found to be effective in fostering members to modify traditional recipes to lower fat and lower sodium alternatives.[7] The results of the current study confirm that faith-based nutrition programs can be an avenue for change, and in this particular context, replacing meat with soy meat-alternatives can occur.

To the best of our knowledge, no studies to date have investigated perceived benefit, barriers, attitude or beliefs regarding consumption of soy meat-alternatives among African Americans. The traditional soul diet consumed by many African Americans increases risk for several chronic health conditions that have a strong dietary connection, including heart disease, cancer, diabetes and obesity. In order to decrease the risk for such health conditions, African Americans should consider replacing their staple meats that contain high amounts of saturated fat with lower fat and lower saturated fat foods.

The goal of this study was to assess benefits, barriers, attitude, and beliefs about soy meat-alternatives in order to determine how likely African Americans would consider adopting these foods in the future. According to the decisional balance concept, one's behavior follows the evaluation of the strength of the perceived benefit or barrier.[8] Our findings showed that most benefits were ranked higher than most barriers. We also found that all attitudinal statements with negative connotation such as "I should not eat soy meat-alternatives because they are high in fat," and "I should not eat soy meat-alternatives because they are high salt," received considerably lower scores than benefit statements such as "I should eat soy meat-alternatives because they would help me to feel better," and "…are high in nutrients," and "…would help me to be healthier." In addition, the mean score for the two statements that assessed willingness to eat soy meat-alternatives, "How likely would you consider eating soy meat-alternatives on a regular basis?" (6.03) and "How likely would you replace eating meat with soy meat-alternatives?" (5.65) confirm these conclusions (data not shown). Thus, these findings indicate that the partici-

Table 2. Beliefs about nutrient content and health benefits of soy meat-alternatives

Soy meat-alternatives:	True	False	I don't know
are high in calories	2	32	6
are high in fat	3	34	3
are high in dietary fiber	26	8	6
are high in salt	3	30	7
are high in protein	26	6	8
may help to lower cholesterol level	37	0	3
may help to lower a risk for a heart attack	36	1	3
may help to lower a risk for diabetes	34	3	3
may cause weight gain	4	31	4*

* missing – 1.

Table 3. Mean (SD) scores for sensory analysis of soy meat-alternatives (1 to 5 with 1 being the lowest score and 5 being the highest)

	Taste/flavor	Smell/aroma	Juiciness/tenderness
Chik'n Nuggets	3.83 (1.5)	3.78 (1.6)	3.48 (1.7)
Veggie Dogs	2.33 (1.9)	2.43 (1.7)	2.68 (1.8)
Spicy Black Bean Veggie Burger	3.08 (1.8)	2.68 (1.8)	3.00 (1.7)

pants considered consuming soy meat-alternatives. Also, the results indicate that soy meat-alternatives may be considered a viable alternative to meat intake.

However, one barrier statement, "I would eat soy meat-alternatives if they were available in grocery stores where I go shopping," received a considerably higher score (3.18) than other barrier statements. This indicates that although participants themselves purchased these items in grocery stores they did not feel confident that they could obtain such foods in stores. This finding is somewhat surprising because participants received specific instruction by the researcher about where to go in the grocery store that they patronize.

Results of a recently published study with African Americans living in North Carolina showed that fat intake comprised almost 50% of calories, which far exceeds the Institute of Medicine Dietary Reference Intakes recommendation of 20 to 35% of calories.[2,9] Soy meat-alternatives contain much lower amounts of fat as compared to meat counterparts. For example, Morningstar's Chik'n Nuggets contain 65% less fat as compared to chicken nuggets. Thus, including soy meat-alternatives in one's diet may be an important way to reduce intake of fat and saturated fat and thus, may improve one's health. In addition, soy meat-alternatives contain fiber, soy protein, and soy isoflavones, all of which are associated with reduced risk for chronic health conditions such as heart disease.

It has recently been suggested that when trying to improve the diets of minority individuals, one should operate within a framework that is culturally relevant.[9] Cultural relevancy has to do with understanding of clients' perspectives, beliefs and backgrounds and may further include race and ethnicity, religious background, sex, and beliefs. It has been proposed that culturally relevant interventions result in higher client satisfaction and greater lifestyle change as compared to programs that are not culturally relevant.[10] In one respect, the present study violated the traditional cultural relevance perspective because we introduced foods into the diet that participants were not previously aware of. Importantly, the results indicate that these new foods were rather favorably accepted by participants. These results have important implications and may be considered ground-breaking in the sense that we found that it is possible to introduce new foods into the diet, even though this would be inconsistent with the cultural preferences of participants.

The participants were members participating in a faith-based nutrition intervention. The program, in addition to the focus on a healthy diet, included Bible-based motivation messages and concepts such as the body as the temple of the Holy Spirit and the body belonging to God. The biblical focus of the program may be an important factor behind participants' openness to try soy meat-alternatives. If this is indeed the case, the faith-based approach could be an important factor in changing dietary habits of members of this minority group.

It is not clear, however, whether the present findings can be generalized to all African American populations or only those who participate in faith-based nutrition programs. It is unlikely that individuals at large may have the opportunity to learn the concepts presented during the faith-based classes. Most of the participants never heard of the soy meat-alternatives, which may be true for many other African Americans from rural parts of the United States.

STUDY LIMITATIONS

Although this research fills an important gap in studies based on a faith-based approach with African Americans, the results should be interpreted in view of some limitations. Data were collected from a convenience sample that consisted of members of just two churches in eastern North Carolina. The analyses presented in this manuscript are based on a very small sample. Also, participants attended a faith-based nutrition program where they learned about soy meat-alternatives. Most participants, prior to the lecture about soy meat-alternatives, were not aware that soy meat-alternatives exist. This may likely be the case with most other African Americans.

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In spite of these limitations, the results indicate that soy meat-alternatives could be favorably received among African Americans who participate in a faith-based program. More research needs to be done to assess how well soy meat-alternatives may be accepted by other African Americans.

REFERENCES

1. State Center for Health Statistics and Office of Minority Health and Health Disparities. North Carolina Minority Health Facts African Americans April 2005. Available at: http://www.schs.state.nc.us/SCHS/pdf/AAFacts.pdf. Last accessed February 1, 2010.
2. Kim KH, Linnan L, Campbell MK, Brooks C, Koenig HG, Wiesen C. The WORD (wholeness, oneness, righteousness, deliverance): a faith-based weight-loss program utilizing a community-based participatory research approach. *Health Educ Behav*. 2008;35(5):634–650.
3. Anderson JW, Johnstone RM, Cook-Newell ME. Meta-analysis of the effects of soy protein intake on serum lipids. *N Engl J Med*. 1995;333(5):276–282.
4. Zhan S. Ho SC. Meta-analysis of the effects of soy protein containing isoflavones on the lipid profile. *Am J Clin Nutr*. 2005;81(2):397–408.
5. Shurtleff W. Aoyagi A. Dr. John Harvey Kellogg and Battle Creek Foods: Work with Soy. Available at: http://www.soyinfocenter.com/HSS/john_kellogg_and_battle_creek_foods.php. Last accessed February 1, 2010.
6. U.S. Food and Drug Administration. FDA approves new health claim for soy protein and coronary heart disease. Available at: http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/FoodLabelingNutrition/FoodLabelingGuide/ucm064919.htm. Last accessed: February 8, 2010.
7. Sue A, Kaplan SA, Calman NS, Ruddock C, Billings J. The role of faith-based institutions in addressing health disparities: a case study of an initiative in the southwest Bronx. *J Health Care Poor Underserved*. 2006;17(2suppl.):9–19.
8. Herrick AB, Stone WJ, Mettler MM. Stages of change, decisional balance, and self-efficacy across four health behaviors in a work site environment. *Am J Health Promot*. 1997;12(1):49–56.
9. Institute of Medicine. Dietary Reference Intakes: Macronutrients. Available at: http://bit.ly/ciEj8U. Last accessed: February 7, 2010.
10. Williams JH, Auslander WF, de Groot M, Robinson AD, Houston C, Haire-Joshu D. Cultural relevancy of a diabetes prevention nutrition program for African American women. *Health Promot Prac*. 2006;7(1):56–67.

AUTHOR CONTRIBUTIONS

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