Combating Childhood Obesity with Caregivers as Change Agents

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ABSTRACT

The incidence of overweight and obesity in Louisiana, the United States and worldwide has reached epidemic proportions. The direct medical costs for obesity and obesity-associated chronic diseases are staggering. The goal of this project is to elucidate the mechanism by which whey protein (WP) and resistant starch (RS) synergistically stimulate satiety and energy expenditure, and reduce body weight. The specific objectives are: 1) To formulate the best combination of WP and RS into food 2) To determine effects of the best combination of WP and RS on, body weight, body fat, and cumulative food intake in obese African American men and women. Thirty-six obese African American men and women will take smoothies/shakes containing WP and RS every morning for 24 weeks. Anticipated successful results will allow the use of these natural bioactive food components in developing a noninvasive, practical, consumer friendly and cost effective approach to combating the current national epidemic of overweight and obesity in the families. The focus of this research project is consistent with NIFA's priority science area Childhood Obesity and Nutrition and NIFA's Program Need Area of studies and experimentation in food and agricultural sciences and student experimental learning.

INTRODUCTION

Obesity is widely recognized as one of the most critical health threats to families and children across the country. Obesity is a very serious health problem for people in Louisiana and especially in African Americans with 40.5% in the State classified as either overweight or obese as compared to 41.2% nationally. African American women have the highest rates of being overweight or obese (79.8%) compared to non Hispanic whites (57.9%). African American children and youth are also obese, followed by Hispanics compared to whites. In 2007, African Americans were 1.4 times as likely to be obese as whites. In 2010, Louisiana was named the fifth most obese state in the country. Louisiana also received an "F" in the area of child weight and obesity on the children's health report card. According to *Healthy People 2020*, diet and body weight are related to health status. Reducing obesity can be accomplished by diet and exercise and altering hunger or satiety signals. Citizens of Louisiana are becoming more concerned about nutritional value, quality, and affordability of their foods. A consumer's knowledge level about the relationship of food, diet, nutrition, fitness and disease is vital to maintaining a healthy society. Results from this research may provide information that consumption of whey protein (WP) and resistant starch (RS) may reduce body fat, body fat distribution and as a result may lower Body Mass Index (BMI) and blood pressure. This should directly increase the public awareness and interest in consumption of foods containing sufficient amounts of WP and RS and acceptance of milk proteins and RS as important bioactive food components. To effectively intervene, researchers and health care practitioners need to address both the energy balance and a physically active lifestyle. The use of foods and their bioactive compounds, which may promote the feeling of satiety, and energy expenditure and thereby the control of food intake in humans, represents a noninvasive and cost-effective strategy for reducing the risk of obesity.

OBJECTIVES

1)Determine how to incorporate the best combination of WP and RS into shakes/smoothies and other foods.

2) Determine effects of the best combination of WP and RS on body weight, body fat distribution, blood pressure, and cumulative food intake in obese African American men and women.

3) Determine effects of nutrition education intervention on body weight, body fat distribution, blood pressure, and cumulative food intake in obese African American men and women.

METHODOLOGY

The new products incorporating WP and RS is being developed in the metabolic kitchen at SUAREC. The consumer acceptability tests are being conducted at the sensory laboratory. The faculty, staff and students are tasting the smoothie/shakes for acceptability. Dr. Malekian, Dr. Snowden and students are recruiting and screening all potential participants, preparing smoothies/shakes to the desired concentration and flavor, overseeing consumption of smoothies/shakes, collecting estimated food records (food dairies) using common household measures (spoon, cups etc.) at the beginning of the study and every Friday thereafter. In addition, demographics, health and other questionnaires are being administered and collected. The requisite approval for a human feeding research study, and consent forms have been obtained from the Institutional Review Board (IRB) for Protection of Human Subjects. A total of 46 participants will be divided in two groups (control and treatment). The treatment group will consume smoothie once a day for 24 weeks while the control group will consume the same product with starch powder. Both groups will participate in nutrition and physical activity intervention.

MEASURABLE OUTCOMES

The primary goal of this project is to develop innovative WP and RS food products (smoothies/shakes) that is effective in reducing body fat in humans. To achieve our goal, we are finding an optimal additive/synergistic dose for WP and RS by developing new products and conducting consumer acceptability tests. We speculate that the group with the highest doses of WP and RS will show the greatest effects. We also expect that consumption of smoothies/shakes and other food products containing WP and RS in the treatment group will decrease food intake compared to the control group. As a result of the human study lasting for 24 weeks, we may observe significant changes in BMI and in body fat distribution. Thus food intake, changes in BMI, and blood pressure will be our main endpoints. Measurable outcomes will be reduction in body weight, distribution of body fat, reduction in food intake, reduction in blood pressure, engaging in physical activity, increased knowledge and adaption of healthy eating patterns as recommended by the US new Dietary Guidelines for Americans (such as eating breakfast, vegetables, fruits, etc.) and foods with WP and RS.

PROGRESS

1. Post doctoral fellow has been hired (Dr. Janana Snowden)
2. Dr. James E. Hines III, MD has come on board to oversee the medical aspect of this project as needed
3. Supplies are being purchased
4. The protocol for the study has been developed
5. The food, health and physical activity questionnaires are being modified using existing ones
6. Recruiting the participants has started. We have already recruited 20 subjects

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