Effect on Dietary Energy Compensation and Weight Gain in Adults by Savory Solid and Sugary Liquid Discretionary Food Sources

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BACKGROUND

What are discretionary foods?

Discretionary food sources are those that contain calories extra to what is included in recommended nutrient intake. These constitute the difference between personal total energy requirements and the energy consumed to meet recommended nutrient intakes (USDA Dietary Guidelines Advisory Committee, 2005).

What is Dietary Energy Compensation

People decide on the quantity and frequency of consuming discretionary foods based on how satisfied they feel in terms of appetite fulfilment and taste. This behavior is called dietary energy compensation (Almiron-Roig et al., 2013).

Dietary energy compensation depends in large part on the phase of the food (solid/liquid) and the major component (sugar/fat/salt/alcohol) (Pereira, 2006), and physical form of the food (Almiron-Roig et al. , 2013). An abundant body of literature from previous studies on sugary solids and drinks have indicated that sugary drinks provide poorer compensation than solid foods, causing 6.8kg weight gain per year.

RESEARCH QUESTION

Extensive epidemiological research has not been done with regards to energy compensation in high salt/fatty savory foods. Hence this study aims to measure and compare dietary energy compensation induced by savory solid foods and liquid sugary drinks, in terms of weight gain and calorie consumption change over the study period.

METHODS

Advertisement for recruiting was done through Craigslist and paper flyers posted in relevant University locations such as clinics and research buildings. Participants were blinded to the actual research question. Once someone indicated interest, we followed the procedure below:

Initial screening visit

Ensure they meet the inclusion criteria (18-59 yrs age, BMI≥25, generally good health status) through the following measures

- SF12 Health perception questionnaire
- Physical activities questionnaire
- Height and weight

Baseline visit

Official beginning of study by having participants sign consent form. They will be given their allotment of snacks /beverages (as per preference questionnaire and then randomization) and instructed to consume per day in amount equivalent to 15% of their daily energy intake.

Resting Metabolic Rate (RMR) was calculated as follows:

Mifflin-St. Jeor Equation
Male: BMR = 10×weight(kg) + 6.25×height(cm) - 5×age(years) + 5
Female: BMR = 10×weight(kg) + 6.25×height(cm) - 5×age(years) – 161

RMR X Activity Factor (AF; 1.4-1.6) = Total Energy Expenditure (TEE)
15% of TEE is the amount they need to consume with their allotted discretionary food/drink. They were also instructed in the use of the online ASA24 software to do their 5 dietary recalls during the 4 weeks.

Week 2

- Provide participants with second set of beverages/snacks
-SF12 Health Perception questionnaire
-Height and weight measurements

Week 4

Administer same 2 questionnaires as 1st visit, take height and weight measurements, debriefing on study.

PRELIMINARY RESULTS

Demographics of enrolled participants

n	Mean Age	Race	Mean initial BMI	Food category
5	31 ± 16	Caucasian	36.44	2 savory, 3 liquid

Preliminary descriptive analyses from anthropometric data , biweekly food log and ASA24 recall data

Two of the enrolled participants completed 4 weeks of the study. One voluntarily dropped out after week 2 and two were lost to follow-up after their week 2 visits. There wasn't a constant pattern of increase or decrease in caloric intake for any of the participants over the course of the study, as indicated by dietary recall information they provided through the ASA24 software.

Most participants were successfully able to adhere to the 15±2 % daily intake of their assigned savory/liquid food intervention. There was a constant increase in weight over the study observed for 2 enrolled participants while 1 showed decrease in weight.

FUTURE DIRECTIONS

This study is still in the process of recruiting participants. Once we have data from about 20 participants, we will compile this into a pilot study report that can be submitted with a grant application for a larger scale study.

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Acknowledgements
This project was supported by the University of Minnesota's Undergraduate Research Opportunities Program.

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