Weighing in on Energy-Dense Food Taxes: How Food Preferences Relate to Obesity

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Obesity = Body Mass Index (BMI) > 30

Economics of a Food Tax
- Increasing the price of calories reducing consumption
- Address externalities (self-control mechanism, time-inconsistent preferences)
- Address externalities - obesity accrues a cost to society (medical expenses in group or federal insurance plans, production losses, national security concerns)
- Raise revenue to finance social insurance or public health initiatives
- Regressivity and crowding out - effects on low SES individuals

Importance of Taste
- Preference towards better quality, fresher foods, higher quality calories
- Over 75% find taste “very important,” suggesting taste may be more important than price and consumers may not respond to some price alterations
- Correlated with an increase in daily caloric intake, but no significant increase in BMI
- Strength of correlation increases as income increases
- People with this preference eat a greater number of calories per day (78.6) with no change in weight, discrepancy is exacerbated by increasing income
- Highest income group, which is associated with a higher quality diet, eats 144 more calories per day, which correlates to roughly 15 pounds per year

Importance of Nutrition
- Prefer healthier choices
- Correlated with a decrease in daily caloric intake and is associated with a decrease in BMI
- People with this preference eat fewer calories per day (71) and have a lower BMI (0.275)
- Suggests that nutritional education and promotion may be the optimal way to utilize public health resources
- Physical activity is also related to a decrease in BMI, offering another target that could be coupled with nutritional education

Ease of Food Preparation
- Weak preference towards food in general
- Easy to prepare items often contain many preservatives, processed ingredients, and lack freshness and quality
- Correlated with an increase in daily caloric intake but no significant relationship with BMI
- People with this preference eat a fewer number of calories per day (72) despite no decrease in weight, suggesting that such foods do not promote lower body weights

Results and Discussion

Methods
This study consisted of multiple regression analysis using the 2007-2008 and the 2009-2010 waves of the National Health and Nutrition Examination Survey (NHANES).

\[ y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + ... + \beta_n x_n + \mu \]

Outcome Variables (y): BMI & Daily Caloric Intake
Predictor Variables: [β1] Food Preference (Importance of Price, Taste, Nutrition, and Food Preparation Control Variables (β): Sex, Race, Age, Income, Desire to Change Weight, Physical Activity, Money Spent on Food

After a preliminary regression analysis was performed, the food preferences (predictor variables) were interacted with both race and income.

Importance of Price
- Prefer low-cost, energy-dense food, or those foods that would be the target of a tax
- Correlated with an increase in BMI (0.79 units) but there is no significant relationship with daily caloric consumption - people who prefer such foods weigh more despite eating the same amount of calories
- Suggests that disfavoring energy-dense foods through a tax might have an effect on body weight even if it did not alter overall consumption
- Whites and Hispanics who are price-sensitive may consume even fewer calories than Blacks and other races with the same increase in BMI

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Background
The United States obesity rate has climbed to 33.8%, compared to 16.9% for all Organization for Economic Cooperation and Development countries. Obesity is linked to a variety of chronic health conditions; obesity-related diseases accounts for at least 2.8 million deaths worldwide and $79 billion dollars annually in medical expenses. Policymakers have proposed a tax on energy-dense, or low water-content, foods as a means of curbing this epidemic. In order for a food tax to be effective, a food must be both price and weight elastic, meaning consumption of calories and weight, respectively, must respond to changes in price. While a successful tax offers a plethora of public health benefits, the failure of such a tax has the potential to be severely regressive. Empirical literature suggests that price can alter the consumption patterns of certain foods, the substitution patterns and decision making processes associated with purchasing food makes the effect of price on weight less clear. This study seeks to better understand consumer preferences as means of assessing the potential of an energy-dense food tax.