

Table of Contents

- 1** The efficacy of sugar labeling formats: Implications for labeling policy.
Vanderlee et al. 2015
- 2** Taxes on tobacco, alcohol and sugar-sweetened beverages.
Blecher, E. 2015
- 3** Gradual reduction of sugar in soft drinks without substitution as a strategy to reduce overweight, obesity, and type 2 diabetes: a modelling study.
Ma et al. 2016
- 4** Sugar-sweetened beverage consumption is associated with change of visceral adipose tissue over 6 years of follow-up.
Ma et al. 2016
- 5** Intermittent access to a sucrose solution impairs metabolism in obesity-prone but not obesity-resistant mice.
Soto et al. 2016
- 6** Consumption prevalence of sugar-sweetened beverage intake among adults – 23 states and the District of Columbia, 2013.
Park et al. 2016



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POLICY

The efficacy of sugar labeling formats: Implications for labeling policy

Vanderlee et al. Obesity. 2015
Dec;23(12):2406-13.

Young adults were significantly more likely to correctly identify that a product had a lot of added sugars when the label presented added sugars as grams or grams + percent daily value.

The Dietary Guidelines for Americans and the WHO recommend limiting consumption of added sugars to 10% of daily calories, but a majority (88%) of adolescents consume more. Nutrition labels on packaged food, a primary source of nutrition information for US consumers, do not include added sugars or percent daily value for sugar.

Vanderlee and colleagues examined consumer knowledge of sugar recommendations and the impact of different labeling formats in a sample of young Canadians. The authors find including percent daily value on the nutrition label improves consumer understanding of the amount of total and added sugars in products.

Canadians (16-24 years) were recruited from an online commercial panel to complete an online survey (n=2,008) and two labeling experiments. In both experiments, one of the label formats was the current Canadian nutrition label (which,

for sugar, is the same as the US label). Participants classified a high- or low-sugar product as having a little, a moderate amount, or a lot of sugar using one of six label formats with varying amount of information on total sugar. Labels that include percent daily value moderately increased participants' ability to correctly identify the amount of total sugar in a product compared with the current label (51% vs. 60%-62%).

Participants also were randomly assigned to one of 3 label conditions for added sugars: no additional information, grams of added sugar, and grams along with percent daily value. Participants were significantly more likely to correctly identify that a product had a lot of added sugars when the label presented added sugars as grams (55%) or grams + percent daily value (72%) compared to a label with no added sugars information (40%).

Less than 10% of all participants correctly identified recommendations for total or added sugars and 60% considered sugar in grams as the unit of measure.

Limitations: The online survey format may not represent how consumers would react to the labels in the real world. Subjects were not randomly selected and therefore results may not be generalizable. ■

Taxes on tobacco, alcohol and sugar-sweetened beverages

Blecher, E. Soc Sci Med. 2015 Jul;136-137:175-9

Taxing beverages based on sugar content may be somewhat more complex to administer than a volume-based tax, but could have advantages in reducing consumption of added sugars. This case study from South Africa shows that a tax on beer based on alcohol content not only decreased consumption, but also was associated with increased promotion and sales of low-alcohol beers.

Whether to tax sugary drinks by volume or sugar content is an important policy question. Taxes on alcohol have been based on the volume of the product or the amount of alcohol. A tax on alcohol or sugar content, in the case of sugary drinks, makes sense because of the positive relationship between dose and harm.

In the 1988-89 fiscal year, South Africa moved from taxing beer and spirits per liter to a tax based on the amount of pure alcohol in the container. The author reported time trends in tax rates, advertising spending, and alcohol consumption data for beer from 1987-2014.

The tax on a can of lighter alcohol beer (4.0% alcohol) is 27% lower than on standard 5.5% alcohol beer. Such a tax provides incentives to producers to produce and promote lower-alcohol products. Since implementation of the content-based tax, the advertising share of light beer increased substantially (e.g., from 7% to 26% for a leading brand from 1997 to 2013). The amount of alcohol consumed from beer per capita declined by 11% between 1999 and 2013.

Limitations: This is a case report from one country that reports only on associations between time trends. The study design neither includes a comparison group nor attempts to adjust for other factors associated with beer pricing, advertising, or consumption. ■

Gradual reduction of sugar in soft drinks without substitution as a strategy to reduce overweight, obesity, and type 2 diabetes: a modelling study.

Ma et al. *Lancet Diabetes Endocrinol.* 2016Feb;4(2):105-14.

Could gradual reformulation to lower sugar content reduce the health impacts of beverages and gain consumer acceptance? This simulation exercise from the UK finds that a 40% reduction in sugar content would reduce daily calorie intake, the prevalence of overweight and obesity, and the incidence of type 2 diabetes among UK adults.

In the United Kingdom, reducing the sodium content of processed foods through setting targets for incremental reduction has led to significant decreases in sodium intake and a decline in population blood pressure. Could application of a similar strategy to sugary drinks lead to reduced consumption and lower obesity and diabetes rates?

Researchers modeled the effects of reducing the sugar content of drinks by 40% over five years (without substitution with artificial sweeteners). A 40% reduction in sugar content would reduce energy intake by 31 calories per day, and bodyweight by 2.1 lbs. over 5 years. This would lead to 300,000 fewer overweight people, 800,000 fewer people with obesity, and the prevention of 221,000-250,000 cases of type 2 diabetes.

Limitations: Simulation models are sensitive to the assumptions and quality of included data. The model in this study was fairly simple. The diabetes estimate does not account for effects of sugar on diabetes incidence by mechanisms other than weight. It is not clear whether consumer taste preferences would support such a large decrease in sugar content, or if consumers would substitute other sugary foods and beverages, thus blunting the effect. The model assumed a constant level of sugary drink consumption, but consumption is declining in the US, suggesting that a smaller reduction target might suffice for US efforts. ■

CONSUMPTION PATTERNS

Differences in Chronic Disease Behavioral Indicators by Sexual Orientation and Sex.

Minnis et al. *J Public Health Manag Pract.* 2016 Jan-Feb;22 Suppl 1:S25-32.

More data are needed to describe disparities in modifiable risk factors for chronic disease by sexual orientation. Minnis and colleagues assessed consumption of soda and fruit drinks among straight, gay, and bisexual men and women. They found gay men (86% versus 79%) and lesbian (80% versus 72%) and bisexual women (82% versus 72%) were more likely to drink sugary drinks weekly compared with straight counterparts.

HEALTH IMPACTS

Sugar-sweetened beverage consumption is associated with change of visceral adipose tissue over 6 Years of follow-up.

Ma et al. *Circulation*. 2016 Jan 26;133(4):370-7.

Half of US adults and two-thirds of youth report consuming one or more sugary drinks per day. Study participants who consumed more than one daily had a 29% greater increase in visceral abdominal fat than those who did not consume any.

Visceral adipose tissue (fat deposited around internal organs in the abdomen) produces hormones such as leptin, an appetite regulator, and pro-inflammation molecules. Excessive visceral fat is linked to the development of type 2 diabetes and heart disease. This large, prospective, cohort study – the first of its kind – showed that regular sugary drink consumption is associated with increased amount of abdominal visceral fat, independent of change in weight.

Researchers collected data on self-reported sugary drink consumption among 1,003 middle age men and women and, six years later, determined the amount and type of abdominal fat using a CT scanner. Sugary drinks included soda and fruit drinks but not sports drinks, energy drinks, and sweet coffee and teas.

Study participants who consumed >1 sugary drink daily had a 29% greater increase in visceral abdominal fat than those who did not consume any. The type of visceral fat also changed to the lower quality fat associated with adverse health outcomes. These changes occurred regardless of any concurrent changes in weight. There was no change in visceral abdominal fat among consumers of diet sodas.

This study further strengthens the causal role of sugary drinks for developing heart disease and type 2 diabetes by providing evidence for an important mechanism independent of weight gain.

Limitations: Participants who consumed more sugary drinks had generally less healthy behaviors (e.g., were more likely to smoke and consumed lower quality diets); although the researchers controlled for these measured factors, others could also be in play. Consumption of sugary drinks was measured at one point in time, was based on self-report, and did not include some important types of beverages. ■

Research Watch reviews the evidence on the health effects of sugar and the effectiveness of policy and other interventions to curb consumption to inform sugar reduction activities across the US.

Healthy Food America acts on scientific evidence to drive change in food policy and industry practice, giving people greater control over their health and reducing diet-related illnesses, such as obesity, diabetes, and heart disease.

This publication was prepared by Jim Krieger and Petra Vallila-Buchman.

FROM THE LABORATORY

Intermittent access to a sucrose solution impairs metabolism in obesity-prone but not obesity-resistant mice.

Soto et al. *Physiol Behav.* 2016 Feb 1;154:175-83

Epidemiologic human studies have shown that people with a greater genetic predisposition to obesity may be more susceptible to gaining weight from sugary drinks. While more studies are needed among humans, this mouse study supports the concept that when genetically vulnerable individuals consume sugary drinks, they are at higher risk of eating and drinking more calories, gaining weight, and developing metabolic abnormalities.

Some people are more susceptible to gaining weight and developing metabolic disorders when exposed to obesogenic diets than others. Is it because some people are more susceptible to the metabolic effects of sugar?

This laboratory study among mice found that obesity-prone mice, when exposed to water that contained sucrose in an amount similar to that found in sugary drinks, consumed more calories, gained weight, increased body fat, and developed fatty livers and insulin resistance. Mice were classified as obesity-prone based on weight gain and fat mass gain during the study. All these adverse effects reversed when availability of sucrose water was removed. The effects were not seen in obesity resistant mice.

The researchers divided obesity-resistant and obesity-prone mice that were fed a high fat/high sugar diet into three groups: 1) access to sucrose-sweetened water (SSW) for 16 weeks, 2) access to SSW for 8 weeks followed by water, and 3) an access to water only control group.

Obesity-prone mice drank more SSW than obesity-resistant ones. Obesity-resistant mice reduced food intake when SSW was available, whereas obesity-prone mice increased food consumed – they did not eat fewer calories to offset the calories from the SSW. Consumption of SSW increased weight, blood cholesterol, and deposition of visceral body and liver fat relative to control, and caused liver damage, but only in the obesity-prone mice. These effects of SSW reversed when mice stopped drinking SSW.

One way the body protects itself from consuming too many calories is by producing hormones from the gut that tell the brain to stop eating. In the obesity-resistant, but not among the obesity-prone mice, drinking SSW produced an increase in these hormones, thus suggesting a possible mechanism for the over-consumption of calories in the latter group. The levels of brain chemicals (neuropeptides) that regulate appetite showed a similar pattern.

Limitations: The findings of studies in mice do not always translate into similar results among humans. The study lasted 16 weeks and thus did not describe the long-term effects of exposure to SSW. ■

CONSUMPTION PATTERNS

Prevalence of sugar-sweetened beverage intake among adults – 23 states and the District of Columbia, 2013

Park et al. MMWR Morb Mortal Wkly Rep. 2016 Feb 26;65(7):169-74.

While sugary drink consumption is declining, many adults still drink too much. Rates are much higher in specific populations and states, suggesting the need for focused efforts in addition to broad population approaches.

Recent data on consumption of sugary drinks among adults show how rates vary across communities. Twenty-three states and DC collected data on adult sugary drink consumption through CDC's 2013 Behavioral Risk Factor Surveillance System. These questions are optional, so not all states participate.

The CDC reports that 1 in 3 US adults consumes one or more sugary drinks per day. Younger adults (43%), men (34%), non-Hispanic Blacks (40%), and persons with less than a high school education (42%) were more likely to consume sugary drinks daily. Consumption varies by geography, ranging from 46% in Mississippi to 18% in Vermont.

Limitations: Data were collected through self-report, are vulnerable to recall and social desirability bias, and are not representative of the U.S. population as a whole. Not all types of sugary drinks were included.

NHANES, which uses a broader definition for sugary drinks, uses a more rigorous data collection method, and covers the whole country, shows half of adults consume one or more sugary drinks per day. ■

Childhood Obesity Incidence in the United States: A Systematic Review.

Cheung et al. Child Obes. 2016 Feb;12(1):1-11.

Cheung and colleagues present results from a systematic review of studies that estimate the incidence of obesity among children in the US to identify peak periods of obesity onset. Authors find incidence (the rate of obesity onset) declined with age from 4% among preschoolers to 1.8% among adolescents. Results suggest a need to focus obesity prevention efforts very early in life.