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## DIET DRINKS AND HEALTH

### Associations of fats and carbohydrate intake with cardiovascular disease and mortality in 18 countries from five continents (PURE): A prospective cohort study.

Dehghan M, Mente A, Zhang X, et al. *Lancet*. 2017; (online)

**Key Question:** What is the relationship between macronutrient intake and cardiovascular disease?

**Key finding:** Higher intake of carbohydrates was associated with higher overall mortality, while higher intake of total fat was associated with lower mortality.

**Implications:** This is one of the largest scale and most diverse cohort studies of diet and health. Findings suggest that global recommendations to limit fat intake to less than 30 percent of total calories may need to be reconsidered.

**A** series of articles from the Prospective Urban and Rural Epidemiology study made headlines claiming to cast doubt on conventional diet wisdom. The PURE study is certainly worth headlines due to its scale – It includes over 135,000 adults from 18 countries (including low-, middle-, and high-income countries) on five continents followed for an average of 7 years.

Data collected at baseline included dietary intake from food frequency questionnaires,

health history, physical activity assessment, demographic information, and BMI. Outcomes of interest were total mortality, major cardiovascular events, and cardiovascular disease mortality.

Participants were categorized into quintiles of fat, carbohydrate, and protein intake based on percentage of calories provided by each macronutrient. The highest quintile of carbohydrate intake (more than 75 percent of calories) was associated with higher total mortality compared to the lowest quintile of carbohydrate intake (less than 50 percent of calories).

Conversely, the highest quintile of total fat intake (about 35 percent of calories) was associated with lower total mortality than the lowest quintile (about 10 percent of calories). Surprisingly, the study also found that higher saturated fat intake was associated with lower total mortality. However, average saturated fat intake in the highest quintile was only 13 percent of calories and the lowest was less than 3 percent. This finding may be more indicative of negative health effects of very low saturated fat intake. ■

**Limitations:** The study looked only at total carbohydrates and did not distinguish between type or source of carbohydrates. Additionally, the level of carbohydrate intake associated with higher mortality was very high – over 65% of calories. Most participants from low- and middle-income countries consumed very high-carbohydrate diets, primarily from refined sources like rice and bread. In this case, poverty, malnutrition, and type of carbohydrates may be contributing to mortality risk. For fats, the “high” fat intake that was associated with lower mortality was only 35 percent of calories from fat, which is not much higher than the current recommendation of consuming <30 percent of calories from fat. The lowest quintile with the highest mortality consumed only 10 percent of calories from fat. Results of this study may be more indicative of the dangers of an extremely low fat, high carbohydrate diet, common in lower income countries. For higher income countries, where average fat intake may be higher than 30-35 percent of calories, this study does not support a recommendation to increase fat intake.

For more analysis of this controversial study, check out this [editorial](#) published in *Lancet*, and this [article](#) from *Harvard School of Public Health*.

## Changes in sugar-sweetened soda consumption, weight, and waist circumference: 2-year cohort of Mexican Women.

Stern D, Middaugh N, Rice MS, et al. *AJPH*. 2017; (in press)

**Key Question:** What effect does an increase or decrease in soda consumption have on weight over time?

**Key Finding:** Participants who decreased their soda intake by one or more servings a week gained less weight than those who had no change in their intake, and those who increased their intake of soda gained more weight over two years.

**Implications:** This study adds to evidence that even small reductions in sugary drink consumption can have a positive impact on weight in a short amount of time.

**E**vidence from Mexico shows that a sugary drink tax has led to modest declines in sugary drink consumption, but what impact could that have on weight and health? This study from Stern and colleagues examined the impact of changes in soda consumption on weight and waist circumference.

This prospective cohort study followed 11,218 Mexican women from 2006 to 2008. Food frequency questionnaires were used to assess sugary soda and sugar-free soda consumption at baseline and again two years later. Weight, BMI, and waist circumference were also measured at both times.

Differences in soda consumption were calculated between the two survey periods, and women were categorized as having reduced consumption (at least one less serving/week compared to baseline), no change, or increased consumption (at least one more serving/week compared to baseline). Changes in weight and waist circumference were then compared between the three categories.

Over two years, women who decreased their soda consumption by one or more servings per week gained 0.4 kilograms less than women who did not change their intake. Conversely, women who increased their intake by one or more servings per week gained 0.3 kilograms more than those who did not change their intake. Further analysis found that each additional serving of soda per day was associated with a weight gain of one kilogram over the two years. Additionally, the researchers found that the association between soda consumption and changes in weight was stronger for overweight and obese women, meaning normal weight women gained less weight per serving of soda than overweight or obese women. ■

**Limitations:** A major strength of this study is that it examined changes in soda consumption and weight, whereas many cohort studies only measure intake at baseline and do not account for changes over time. However, there are still several limitations. First, the study looked at soda consumption only and did not ask about intake of other sugary drinks. Intake, weight, and waist circumference were all self-reported, which is prone to bias. Finally, participants in this study included only Hispanic women living in Mexico, so results may not apply to other populations.

## COMMUNICATIONS

### Partisan responses to public health messages: Motivated reasoning and sugary drink taxes.

Gollust SE, Barry CL, Niederdeppe J. *Journal of Health Politics, Policy, and Law*. 2017;42(6)

**Key Question:** How does political identification influence support for sugary drink taxes and response to certain messages about taxes?

**Key Finding:** People who identify as republican are generally less supportive of sugary drink taxes than democrats or independents. Messages that refute industry arguments as being motivated by profit

*increased support for taxes among democrats and independents, but decreased support among republicans. Pro-tax messages had no effect on tax support.*

**Implications:** *Sugary drink taxes are highly politicized, and political ideologies may bias people's responses to certain pro-tax arguments. Gaining support for taxes requires a better understanding of what messages are most persuasive, and may require tailoring messages to certain political ideologies.*

**M**otivated reasoning suggests that people's prior beliefs and ideologies motivate their response to news and information. This study tested the ability of certain pro-tax messages to sway participants' support of taxes, and analyzed the results based on political identity.

Participants were assigned to a control group or one of three experimental groups who were exposed to different messages: 1) a strong pro-tax message, 2) a two-sided message pairing the pro-tax message with an anti-tax message, and 3) a source refutation message that identified the soda industry as the source of anti-tax messages and refuted their claims as motivated by profit. After reading their assigned message, participants then answered questions about their support for sugary drink taxes and their political party identification.

Overall, democrats and independents were more likely to support a sugary drink tax than republicans. The pro-tax message had little influence on support in any group. The two-sided message slightly decreased support in all groups, suggesting that the anti-tax message is stronger than the pro-tax message.

The source refutation message had a strong positive influence on democrats and independents, but a strong negative influence on republicans. A possible explanation is that the refutation message activated the probusiness, antitax sentiment common in republicans, and motivated a stronger negative response as a way to reject the antibusiness message. ■

**Limitations:** The study did not measure or control for participants' own consumption of sugary drinks, which would likely have a strong influence over their opinion on sugary drink taxes. The researchers also did not examine the processing or reasoning behind people's responses to different messages. Further research is needed to understand why certain groups respond to messages differently. The study population is representative of the whole US population; since sugary drink taxes are primarily being tried at the city or county level, message testing should be based on the local population.

## How food companies influence evidence and opinion – Straight from the horse's mouth.

Sacks G, Swinburn BA, Cameron AJ, Ruskin G. *Critical Public Health*. 2017; (online)

For better or worse, the food and beverage industries have permeated into the public health world through philanthropy, funding research, sponsoring professional associations, and other tactics portrayed as efforts to be part of the solution to obesity and other diet-related chronic diseases. Critics are skeptical of industry's true motivations, but without access to private, internal communications, it is difficult to prove malfeasance. U.S. Right to Know obtained email communications between former Coca-Cola executives. The emails reveal three main tactics:

- Sway scientific evidence by directly commissioning studies, manipulating external organizations conducting studies, and casting doubt on non-industry sponsored evidence.
- Influence scientific bodies and other professional associations by seeking leadership roles and suggesting certain topics of discussion
- Building relationships with academics, government leaders, policy-makers, and other opinion leaders to guide global debate on food and health

Overall, these emails provide evidence of industry's deliberate attempts to undermine objective science and control the global conversation around diet, nutrition, and health, and indicate that their motivation is self-preservation at the cost of public health. However, this study examined a very limited set of emails involving only two people, and cannot be assumed to apply to the whole industry.

## SUGARY DRINK TAXES

### Employment changes associated with the introduction of taxes on sugar-sweetened beverages and nonessential energy-dense food in Mexico.

Guerrero-Lopez CM, Molina M, Colchero AM. *Preventative Medicine*. 2017; (in press)

**Key Question:** Have there been any changes in employment in the food and beverage sectors following implementation of a tax on sugary drinks and junk foods?

**Key Finding:** Researchers found no significant changes in employment associated with the new taxes.

**Implications:** This is the first peer-reviewed study to analyze the observed impact of a sugary drink tax on employment. Results of this study refute industry claims that taxes will cause the loss of jobs in beverage manufacturing, distribution, and retail.

**S**ugary drink tax opponents and the beverage industry argue that a sugary drink tax will lead to layoffs and hurt the economy, but there is little evidence to support or refute this claim. This new study from Guerrero-Lopez and colleagues analyzed employment data in Mexico, where a sugary drink tax has been in effect since January 2014, and is the first rigorous, peer-reviewed analysis of the observed impact of a tax on jobs.

This study utilized three national-level data sources – Monthly Surveys of the Manufacturing Industry, Monthly Surveys of the Commercial Establishments, and the National Occupational and Employment Survey – to measure employment numbers in beverage manufacturing, retailers that sell beverages, and overall national employment rates. Data collected from these sources spanned a ten-year period to account for trends in employment before implementation of the tax.

Analysis of employment trends in beverage manufacturing and retail before and after tax implementation found no significant difference in beverage-related employment following implementation of the sugary drink tax. Similarly, the tax had no significant impact on the overall national unemployment rate two years after implementation.

Despite a 6% drop in sales of sugary drinks in Mexico over the past two years, employment in beverage-related jobs has not been negatively impacted. This could be due to increases in sales of bottled water and other untaxed beverages which are mostly manufactured and sold by the same establishments as sugary drinks. ■

**Limitations:** Since the tax occurred on a national level, researchers were unable to find an adequate comparison group. To address this, researchers compared trends before and after tax implementation and adjusted for other variables that change with time. The researchers were unable to adjust for other national interventions implemented pre- or post-tax that may have impacted employment rates.

## The potential for federal preemption of state and local sugar-sweetened beverage taxes.

Pomeranz JL, Mozaffarian D, Micha R. *Am J Prev Med*. 2017; (In press)

This article from Pomeranz and colleagues examines the issue of preemption and its potential impact on public health policies, particularly sugary drink taxes. Preemption occurs when a higher level of government enacts a law that restricts or eliminates the ability of a lower level of government to legislate an issue.

Sugary drink taxes have been pursued at the state and local level in the US, and have only been successful at the local level. Some states have threatened to preempt local authority to enact such taxes; for example, the Michigan state legislature recently passed a bill that would prohibit local government from taxing food and drinks. The federal government also has the authority to preempt state and local taxes. This article examines that authority and considers the potential of federal preemption of sugary drink taxes.

## REFORMULATION

### Modelled dietary impact of industry-wide food and beverage reformulations in the United States and France. [🔗](#)

Gressier M, Privet L, Mathias KC, et al. *Am J Clin Nutr.* 2017;106

**Key question:** *What impact would reformulation or substitution of unhealthy food products have on the overall diet of American and French populations?*

**Key finding:** *Reformulation and substitution of food products to meet certain nutritional standards would lead to an overall decrease in total energy intake and more Americans meeting recommendations for saturated fat, added sugar, and sodium intake.*

**Implications:** *Reformulation of key nutrients in food products can play an important role in improving the overall dietary quality of the US population.*

**F**ood reformulation has been used as a strategy to reduce sodium and trans fat in the food supply, and has been suggested for reducing intake of other nutrients like added sugar and saturated fat. Gressier and colleagues modeled the impact of reformulating food products to meet nutritional standards set by the Nestle Nutritional Profiling System (NNPS) on the overall diet quality of the French and American populations.

NNPS defines nutrition targets for a range of food and beverage products by category. Each target is specific to the product category and its role in the diet (for example, nutrition targets for ice cream are different than for soups). This study modeled two scenarios: 1) reformulation: nutrient composition of all products not meeting NNPS standards are modified to meet the standards; 2) substitution: products that do not meet NNPS standards are replaced with similar existing products that do meet standards.

Baseline data for US dietary intake were obtained from the National Health and Nutrition Examination Survey (NHANES) 2011-2012. More than three-quarters of calories in the average American diet came from foods that fall within the scope of NNPS standards, and about two-thirds of those food products did not meet NNPS standards.

Reformulation reduced average daily energy intake by about 90 calories, and substitution reduced it by about 220 calories. Both scenarios also led to significant declines in added sugar, saturated fat, and sodium intake. Notably, both scenarios doubled the percent of children meeting dietary recommendations for added sugar consumption. ■

**Limitations:** Neither scenario is realistic in real world conditions. The reformulation model was the more conservative approach, assuming that reformulation would be done to meet exactly the specific nutrient targets. Modifications to the products' nutrient profiles were hypothetical and not necessarily attainable in real-life. The substitution model was more extreme because it eliminated and substituted all products that did not meet NNPS standards. Given that most products did not meet NNPS standards, this scenario significantly limited the number of

products that could be consumed, which is also unrealistic. The true potential impact of reformulation likely lies somewhere between results of the two scenarios, since a more realistic scenario would include some reformulation and some substitution. Funding for this study was provided by Nestle, and several of the authors are affiliated with the Nestle Research Center in Switzerland.

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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.

*This publication was prepared by Jaclyn Konich.*

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.