



SUGAR, HEART DISEASE AND STROKE

FACTS

- Heart disease and stroke are leading causes of death in Canada, responsible for 27.3% of all deaths.¹ Over 1.3 million Canadians are living with heart disease² and 315,000 Canadians are living with the effects of stroke.³
- More than 60% of Canadian adults⁴ and 31% of children and youth aged 5 to 17 years are overweight or obese.⁵ Children who are obese are at increased risk of remaining overweight or obese as adults.⁶
- Up to 80% of early heart disease and stroke can be prevented through adopting healthy behaviours including eating a healthy diet.
- Sugar is a carbohydrate that provides energy to the body. Other than providing energy, sugar has no other nutritional benefits.
- Sugar can occur naturally in milk, fruit, vegetables, starches, grains and most plant based foods. Sugars can also be added to foods and drinks for flavour, as a sweetener, as a preservative or to enhance the texture of products.
- Free sugars include all monosaccharides and disaccharides added to foods by the manufacturer, cook or consumer, plus sugars naturally present in honey, syrups and fruit juices.⁷
- It is estimated that Canadians consume as much as 13% of their total calorie intake from added sugars.^{8,9} This added sugar estimate does not take into account the broader range of sugars captured by free sugars (which also include 100% fruit juice, honey, etc.). Consumption of free sugars among Canadians would be higher than 13%.
- Ten per cent of total energy (calories) from free sugars in a 2,000-calorie-a-day diet is equivalent to about 48 grams (roughly 12 teaspoons) of sugar. Five per cent of total energy is equivalent to about 24 grams (roughly 6 teaspoons) of sugar.
- Excess sugar consumption is associated with adverse health effects including heart disease,¹⁰⁻¹² stroke,¹⁰ obesity,¹³⁻¹⁷ diabetes,¹⁸⁻²² high blood cholesterol,²³⁻²⁴ cancer²⁵ and dental caries (cavities).²⁶
- Individuals who consume greater than or equal to 10% but less than 25% of total energy (calories) from added sugar have a 30% higher risk of death from heart disease or stroke when compared to those who consume less than 10%. For those who consume 25% or more of calories from added sugar, the risk is nearly tripled.¹⁰
- While there are a variety of causes of obesity, researchers speculate that excess caloric intake may be the single largest driver.²⁷ Larger portion sizes contribute to over consumption of calories and excess body weight.¹⁶
- Sugar sweetened beverages (SSBs) are the single largest contributor of sugar in the diet.¹⁰ A single 355 mL can of sugar-sweetened soda contains up to 40 grams (about 10 teaspoons) of sugar and no health benefits.²⁸
- The total volume of SSBs available to Canadians is 3.5 billion litres, the equivalent of 110 L per person per year or over 300 mL per day.²⁹ A standard sized soft drink can is 355 mL.
- As children get older, they consume more sugar from soft drinks. Boys' average daily consumption of regular soft drinks is 68 grams at ages 4 to 8 years and increases to 376 grams at ages 14 to 18 years. Among girls the increase is from 47 to 179 g.³⁰





- A tax of 5 cents per 100 mL on SSBs would raise \$1.8 billion in tax revenue annually.²⁹
 - Worldwide it is estimated that 180,000 deaths annually are attributed to the consumption of SSBs, including 133,000 from diabetes, 44,000 from cardiovascular disease, and 6,000 from cancer.³¹
 - Various organizations including the World Health Organization and groups in the United States,^{11,32,33} United Kingdom,^{34,35} Italy,³⁶ and Scotland³⁷ have developed recommendations for reduced sugar consumption among their populations.
2. Work with organizations like the Heart and Stroke Foundation to influence the government and the food industry to reduce free sugars in the food supply. Visit heartandstroke.ca to learn more and get involved.
 3. Promote and encourage adoption of food policies that create healthier environments in places we live, work and gather such as schools, workplaces, sports clubs, faith centres, and community organizations.

RECOMMENDATIONS

The Heart and Stroke Foundation recommends that an individual's total intake of free sugars not exceed 10% of total daily calorie (energy) intake, and ideally less than 5%.

The Heart and Stroke Foundation recommends that:

CANADIANS

1. Reduce free sugars consumption by:
 - Preparing meals using fresh and staple foods.
 - Developing and sharing skills in food preparation and cooking.
 - Limiting eating out at restaurants and consumption of ready-to-eat food and drink products. If eating out, choose restaurants that serve freshly made unprocessed dishes and provide nutrition information to make a healthy choice.
 - Buying foods in shops and markets that offer a variety of fresh foods. Avoiding those that sell mainly ready to eat products.
 - Buying fresh or frozen fruit, or fruit canned in water without artificial sweeteners.
 - Reducing the amount of sugar used during preparation of food and in recipes.
2. Conduct surveillance to:
 - Measure free sugars intake of Canadians and continue to measure intake over time.
 - Assess free sugars content of foods.
 - Establish targets for the food industry to decrease free sugars content in foods, monitor free sugars levels in foods and develop benchmarks towards reduction of free sugars in the food supply.
3. Ensure clear and comprehensive nutrition labelling of the free sugars content in the Nutrition Facts table of all packaged foods, grouping all sugars together when listing ingredients on product packaging, and standardized serving sizes on the Nutrition Facts table.
4. Restrict the marketing of all foods and beverages to children.
5. Educate Canadians about the risks associated with free sugars consumption through public awareness and education campaigns.
6. Support food literacy among Canadians by implementing programs to improve knowledge and skills required to make informed eating decisions and prepare fresh nutritious meals.

FEDERAL GOVERNMENT

1. Adopt the free sugars thresholds proposed by the Heart and Stroke Foundation, specifically, a free sugars intake of less than 10 per cent of total daily energy intake, and ideally less than 5 per cent.
2. Conduct surveillance to:
 - Measure free sugars intake of Canadians and continue to measure intake over time.
 - Assess free sugars content of foods.
 - Establish targets for the food industry to decrease free sugars content in foods, monitor free sugars levels in foods and develop benchmarks towards reduction of free sugars in the food supply.
3. Ensure clear and comprehensive nutrition labelling of the free sugars content in the Nutrition Facts table of all packaged foods, grouping all sugars together when listing ingredients on product packaging, and standardized serving sizes on the Nutrition Facts table.
4. Restrict the marketing of all foods and beverages to children.
5. Educate Canadians about the risks associated with free sugars consumption through public awareness and education campaigns.
6. Support food literacy among Canadians by implementing programs to improve knowledge and skills required to make informed eating decisions and prepare fresh nutritious meals.



7. Continue to support and improve the Nutrition North Canada program to ensure affordable pricing of nutritious foods in remote northern locations.
8. Provide financial, research and policy support to foster growth of local food procurement initiatives and the improvement of food distribution networks that increase access to healthy food (particularly traditional food) for First Nations, Inuit, and Métis populations, as well as others living in northern, remote and rural communities. This should include access to safe drinking water as a healthy alternative to sugar-loaded drinks.
9. Develop agricultural policies and subsidies that provide incentives for the production and distribution of healthy foods (particularly vegetables and fruit) in order to improve accessibility and affordability.
10. Adopt a tax on beverages high in free sugars (energy dense, nutrient poor). The tax should be an excise tax and be based on free sugars per unit. Revenues from such a taxation stream should be used to subsidize vegetables and fruit to make healthy eating more affordable.
11. Avoid public health partnerships with producers and suppliers of foods high in free sugars.

PROVINCIAL/TERRITORIAL GOVERNMENTS

1. Adopt a tax on beverages high in free sugars (energy dense, nutrient poor). The tax should be an excise tax and be based on free sugars per unit. Revenues from such a taxation stream should be used to subsidize vegetables and fruit to make healthy eating more affordable.
2. Restrict the marketing of all foods and beverages to children.
3. Ensure nutritional information of all foods sold in food service outlets and restaurants are readily available to consumers at point of purchase. Specifically:
 - Sodium and calories on overhead menu boards of food service outlets, and
 - Free sugars, sodium, trans fats, saturated fats, and calories on table menus in restaurants.
4. Adopt food policies in public places like schools and government buildings that limit availability of processed foods and beverages high in free sugars.

5. Limit portion size of sugar-loaded beverage containers at food service locations to a maximum of 16 ounces (500 mL) to reduce consumption of sugary drinks.

MUNICIPAL GOVERNMENTS, REGIONAL HEALTH AUTHORITIES, WORKPLACES AND SCHOOL BOARDS

1. Enable the establishment of Food Policy Councils and Food Charters that promote and develop local policies, programs and strategies related to access of healthy unprocessed foods.
2. Limit the consumption of sugar-loaded beverages through a variety of policies including restricting the portion size to 16 ounces (500 mL) in food service outlets and banning sugar-loaded beverages in public facilities such as recreation centres, hospitals, and schools.
3. Ensure potable drinking water (in fountains and/or coolers) is accessible to children and adults in commonly used places including parks, public facilities, schools, recreation centres, and workplaces as a hydration alternative to sugar-loaded beverages.
4. Establish policies and zoning by-laws designed to promote the establishment of grocery stores and other venues (e.g., farmers' markets, community gardens, community kitchens, convenience stores, etc.) that provide affordable access to healthy food, particularly in areas of low availability and restrict accessibility of fast food outlets and convenience stores near schools.
5. Support community programs and initiatives that can potentially improve access to healthy food including community gardens, community kitchens, local food distribution networks, community supported agriculture, school meal programs, etc.
6. Develop, implement and monitor school food policies that increase access to affordable healthy food and beverages while decreasing access to unhealthy choices. For example:
 - Implement and enforce nutrition standards for food and beverages provided at school venues including cafeterias and vending machines.
 - Offer guidance to parents and students on healthy bag lunch and snack options.



- Make healthy food (particularly vegetables and fruit) readily available. This can be accomplished, for example, through supporting and participating in programs that help bring healthy food to schools (e.g., Farm to Cafeteria Canada's Farm to Schools program, FoodShare, and Breakfast for Learning) and the establishment of school community gardens.
- Use healthy foods and beverages or non-food alternatives for school fundraising efforts.

RESEARCHERS

1. Conduct research to quantify free sugars in the Canadian food supply and measure consumption of free sugars among Canadians of various age groups and populations. Use national surveys to continue to quantify free sugars intake over time.
2. Undertake research on behavior change approaches to promote the reduction of free sugars consumption, in particular reduction of sugar-loaded beverage consumption.
3. Use modeling to quantify the economic and public health impacts of policy measures to reduce the intake of free sugars and unhealthy foods.

FOOD AND BEVERAGE INDUSTRY, MANUFACTURERS, AND RETAILERS

1. Reduce free sugars content in the food environment through a variety of approaches such as:
 - Reformulating products to contain less free sugars.
 - Reducing portion sizes of energy dense, nutrient poor food and beverage products.
 - Diversifying to develop products that are healthy alternatives that are low in free sugars, unhealthy fats, and sodium.
2. Disclose the amount of free sugars on the Nutrition Facts table of packaged goods.
3. Stop the practice of marketing of foods and beverages to children.
4. Ensure that product placement of sugary foods and beverages do not influence children. Energy dense, nutrient poor products should not be placed at children's eye level or at check-out locations. Instead, healthy products should be placed in highly visible areas.

5. Improve the nutritional quality of foods that are available in school environments and remove junk foods from school vending machines and cafeterias, including high fat and high sugar foods and beverages.
6. Make the healthy choice the less expensive choice and promote these choices.
7. Improve nutrition information available to consumers in restaurants. Canadians should have access to better nutrition information on the overhead and table menus to help make healthier choices at the point of purchase.
8. Ensure food labelling, packaging, and health claims meet high standards and provide accurate and honest depictions of content.
9. Use all available strategies to support public health efforts to create healthier food systems. This includes monitoring progress towards a healthier food system by sharing relevant data with governments and assessment institutions.
10. Ensure healthy foods and beverages are affordable and accessible.
11. Limit the use of artificial sweeteners and sugar substitutes in products.

HEALTH-RELATED EDUCATIONAL INSTITUTIONS

Educate health professionals about the health risks of excess free sugars consumption, how to reduce free sugars intake within the context of a healthy diet and how to counsel their patients/clients to reduce free sugars intake.

BACKGROUND INFORMATION

WHAT IS SUGAR?

Sugar is a carbohydrate that provides energy to the body. Other than providing energy, sugar has no other nutritional benefits. Sugar can occur naturally in fruit, vegetables, starches, grains and most plant based foods (e.g., lactose in milk, or fructose in vegetables and fruit). Sugars are also added to foods and drinks for flavour, as a sweetener, as a preservative or to enhance the texture of products.

There are a number of definitions and terms used to describe sugars in foods.³⁸ The World Health Organization defines 'free sugars' as sugars and syrups added to foods



during processing or preparation.⁷ This definition includes all monosaccharides and disaccharides added to foods by the manufacturer, cook or consumer, plus sugars naturally present in honey, syrups and fruit juices. This definition does not include sugars found in milk, vegetables, fruit, legumes, grains, seeds and nuts. Foods like vegetables and fruit with natural sugars also contain fibre and nutrients which provide health benefits. The sugar found in vegetables and fruit is also referred to as bound sugar. The positive benefits of consuming vegetables and fruit is clear (see Heart and Stroke Foundation's Position Statement titled Vegetable & Fruit Consumption and Heart Disease and Stroke³⁹). Evidence is also clear that chronic overconsumption of sugar in foods with no or little nutritional value (e.g., sugar sweetened beverages (SSBs) and liquid sugars) leads to unfavourable health effects.¹⁰⁻²⁶

HEALTH EFFECTS OF SUGAR

There is a body of evidence indicating that excess sugar consumption is associated with adverse health effects including heart disease,¹⁰⁻¹² stroke,¹⁰ obesity,¹³⁻¹⁷ diabetes,¹⁸⁻²² high blood cholesterol,^{23, 24} cancer²⁵ and dental caries (cavities).²⁶

There is a clear relationship between sugar and obesity. A systematic review of the evidence conducted in 2013 concluded that reduced intake of dietary free sugars results in weight loss and increased sugar intake is associated with weight increase.¹⁶ Evidence from this review further indicates that intake of sugar sweetened beverages (SSBs) is a determinant of body weight and the overconsumption of empty calories contributes to weight gain.

Individuals who have a dietary pattern that includes more than one SSB and fruit juice serving per day have a higher risk of developing chronic disease, particularly coronary heart disease and diabetes.⁴⁰ Women who consumed 2 to 3 SSBs per day had a 31 per cent greater risk of developing type 2 diabetes compared to women who consumed less than 1 SSB per month.⁴¹ The Nurses Health Study of over 88,000 women followed for 24 years, found that those who consumed 2 SSBs or more per day had a 35 per cent greater risk of developing coronary heart disease compared with those who consumed less than 1 SSB per month.⁴² In a similar analysis of the Physicians Health Study,⁴³ researchers found that consumption of SSBs was associated with a

significant increased risk of coronary heart disease (CHD), even after adjustment for lifestyle factors including overall diet quality and body mass index. For each serving-per-day increase in SSB intake, the risk of CHD increased by 19 per cent. Individuals who consume fewer SSBs have less chronic disease risk.⁴⁴

SSBs are also associated with greater risk of death from chronic disease. Preliminary research presented at the American Heart Association's Epidemiology and Prevention/Nutrition, Physical Activity and Metabolism 2013 Scientific Sessions suggests sugary beverages are to blame for about 183,000 deaths worldwide each year, including 133,000 diabetes deaths, 44,000 heart disease deaths and 6,000 cancer deaths.³¹ The death rates associated with sweetened beverages were highest in those under the age of 45. A study published in early 2014 found that individuals who consume greater than or equal to 10 per cent but less than 25 per cent of total energy (calories) from added sugar have a 30 per cent higher risk of death from heart disease or stroke when compared to those who consume less than 10 per cent. For those who consume 25 per cent or more of calories from added sugar, the risk is nearly tripled. As added sugar consumption increases, the risk of death from heart disease and stroke increases.¹⁰

A 2014 systematic review of the effects of restricting sugar intake on dental caries²⁶ found that there was no harm associated with reducing the intake of free sugars to less than 5 per cent of total energy, particularly when considering the risk of dental caries throughout the life-course.

SUGAR CONSUMPTION IN CANADA

The average total intake of sugar among Canadian adults is approximately 110 grams per day, equivalent to approximately 26 teaspoons or 21 per cent of total energy intake, based on a 2,000 calorie-a-day diet.⁴⁵ Total sugar intake represents sugars from all sources including sugars found in milk products, vegetables and fruit.

Of the average 110 grams of total sugar consumed per day by Canadians, 31 per cent is from vegetables and fruit and 35 per cent is from 'other' foods that don't fit within the four food groups of Eating Well with Canada's Food Guide, which includes items such as soft drinks and candy that are high in added sugars.⁴⁵ The percentage of sugar derived from confectionary items (for instance, chocolate bars and

candies) was about twice as high for children (9 per cent) and adolescents (10 per cent) as for adults (5 per cent). Regular soft drink consumption increases with age. In Canada, regular soft drinks account for 4 per cent of children's average sugar intake and among adolescents, the figure rises to 14 per cent.

The Canadian Sugar Institute reports that the current average Canadian intake of added sugars is estimated to be between 11 and 13 per cent of total energy intake (calories).⁸ The World Health Organization estimates that Canada's added sugar consumption level is about 13 per cent of total energy intake.⁹ Given that these estimates of added sugar intake do not take into account the broader range of sugars captured by free sugars (which also include 100 per cent fruit juice, honey, etc.), we can therefore conclude that free sugars consumption among Canadians is higher than 11 to 13 per cent.

SUGAR THRESHOLDS

Eating Well with Canada's Food Guide recommends that Canadians limit the consumption of sugar, salt and fat. The Food Guide does not provide a specific amount of sugar recommended for a healthy eating pattern.

Various organizations including groups in the United States,^{11,32,33} United Kingdom,^{34,35} Italy,³⁶ and Scotland³⁷ have developed recommendations for reduced sugar consumption among their populations. The thresholds and definition of 'sugar' varies among the recommendations, however, organizations recognize the health effects of increased sugar consumption and the need to provide advice to reduce sugar intake among their populations.

In March 2014, the World Health Organization released draft recommendations on the consumption of free sugars for adults and children.⁷ These guidelines recommend:

- Reduced intake of free sugars throughout the life-course (strong recommendation).
- In both adults and children, intake of free sugars not exceed 10% of total energy (strong recommendation).
- Further reduction to below 5% of total energy (conditional recommendation).

The Heart and Stroke Foundation supports the draft recommendations of the World Health Organization.

INTERVENTIONS TO REDUCE SUGAR CONSUMPTION

Food education and preparation skills

Adequate food preparation skills are needed to prepare healthy meals. Individuals who lack basic food selection and preparation skills may be more likely to rely on convenience and fast foods. Developing and sharing important life skills like food preparation and cooking can help contribute to good health. Preparation of foods at home also allows individuals to control the amount of sugar added to meals. Using fresh and staple foods such as whole grains, fresh or frozen fruit and vegetables, and experimenting with recipes to reduce the sugar content are ways to reduce the free sugars content of foods prepared at home. Research shows that initiatives aimed to increase food literacy can be successful in improving healthy eating and cooking habits.⁴⁶

Healthy eating education is important to reducing sugar consumption among Canadians. Improved understanding and awareness of the relationship between free sugars and overall health, including the elevated risk of heart disease, stroke, obesity and other health conditions is important. In addition to the health risks, individuals need to be aware of the amount of sugar they consume in processed and packaged foods, and when eating out. Processed foods are often sweetened with free sugars to make them more appealing. Many foods with free sugars can also be higher in fat, sodium and calories. Limiting consumption of ready to eat food and drink products and eating out at restaurants, cutting back on baked goods and desserts and avoiding sugar-loaded beverages will help reduce free sugars intake. Consumers should look for foods in shops and markets that offer a variety of fresh foods and avoid those that sell mainly ready to eat products. This approach to eating has been applauded by experts for its positive impact potential on health outcomes.⁴⁷ Brazil has taken a leadership role in this area and implemented new national recommendations in its food guide, which discourage eating processed foods and encourage whole fresh foods as the foundation of healthy eating.⁴⁸

Nutrition information

The current Nutrition Facts table found on packaged products does not provide the amount of free sugars contained in a product. Clear and comprehensive nutritional labelling of the free sugars content of all packaged foods is needed to help fully inform individuals of the amount



of free sugars in products. The ingredient list on food products can help identify foods that are higher in free sugars. Consumers can look for sugar ingredients in the ingredient list such as sucrose, dextrose, liquid invert sugar, corn syrup, high fructose corn syrup and molasses. The U.S. recently proposed revisions to its nutrition facts label with the aim to improve dietary habits through clear and concise information on added sugar content and calories of food products.⁴⁹ Similarly, Health Canada recently also proposed revisions to its Nutrition Facts table, including the provision of information on total and added sugar content. The Heart and Stroke Foundation believes that these revisions are promising. However, it is also the Foundation's position that it is preferable to follow the World Health Organization's approach and expand the added sugar definition to include free sugars. Furthermore, food and beverage industries, and food retailers should ensure food labelling, packaging, and health claims meet high standards and provide accurate and honest depictions of content. Consumers are often confused by contradictory or misleading product claims. This should be regulated to avoid harm. Serving sizes on Nutrition Facts tables should be standardized.

Ensuring nutritional information is readily available at chain restaurants and food service outlets can also help inform customers about the nutritional value of the foods they consume. Providing the sodium and calorie counts of all foods on overhead menu boards in the food service sector and the free sugars, sodium, trans fats, saturated fats, and calorie counts on table menus in restaurants, can help improve consumer understanding and decision making when eating out. Again, the U.S. leads in this area as New York City mandated restaurant nutrition labelling in 2008 with many regions developing and implementing similar policies. More recently, the U.S. federal government has passed food labelling requirements for restaurants, retail food establishments and vending machines because of the positive impact on dietary habits and the reduction in chronic disease seen elsewhere.⁵⁰

Sugar in liquid beverage form

While sugar is a problematic part of our diet, sugar in liquid beverage form is of particular concern. SSBs such as soft drinks and sports drinks are considered energy-dense, nutrient poor beverages because of their high caloric levels and minimal nutritional value. A single 355 mL can of sugar-sweetened soda contains up to 40 grams (about 10

teaspoons) of sugar and no health benefits.²⁸ Individuals who drink SSBs do not feel as full as they do if they eat the same number of calories from solid food.⁵¹ Furthermore, they do not compensate by eating less, which can lead to excess calorie intake.⁵² Health experts cite SSBs to be a leading driver of obesity and chronic disease. Research shows SSBs to be the largest single source of calories in the North American diet and as such, experts recommend SSB reduction strategies.²⁷ Some jurisdictions including Mexico, France, Denmark, regions in the U.S. and Europe, have mandated a tax on sugar sweetened beverages and sugary foods as a means to deter consumption and/or generate revenues for health promotion programs/healthcare and/or subsidies for healthy foods such as fruits and vegetables.

A restriction on the serving size of sugar-loaded drinks is considered a favourable policy option because it does not remove an individual's choice to consume these drinks; rather it limits the size of a single portion, thereby reducing the calories consumed. Research shows that limiting the portion size of SSB containers at food service locations to reduce consumption of sugary drinks could contribute to reduced intake and lead to reductions in population obesity rates.^{53,54} In addition, California almost approved a bill requiring companies to include safety warning labels on sugar-sweetened beverages as a means to increase awareness of harm and reduce consumption.

In certain settings like schools, recreation facilities and public spaces, SSBs and energy dense, nutrient poor foods have been eliminated through procurement policies. Creating healthy food environments and limiting availability of processed foods and beverages high in free sugars in places we live, work and gather such as schools, hospitals, workplaces, sports clubs, faith centres, and community organizations can contribute to reduced sugar consumption. Organizations such as Canadian Centre for Occupational Health, Dietitians of Canada, Community Food Centres Canada, and Food Secure Canada have resources to assist in the development of healthy food policies. There are many U.S. and Canadian jurisdictions with policies to restrict sales of SSBs on school properties, in daycares or in recreation centres in an effort to create a healthy environment for local children and youth.⁵⁵ In addition, ensuring that potable drinking water (in fountains and/or coolers) is accessible to children and adults in these settings may contribute to reduced sugar-loaded beverage consumption. Replacing



sugar-loaded beverage intake with water could result in a reduction in total energy intake and reduced rates of obesity. One study of elementary school aged children found reduced rates of obesity after an intervention provided water fountains in schools.⁵⁶

School food policies

Establishing healthy eating habits early in life are important to promote good health throughout the life continuum. School food policies that increase access to affordable healthy food and beverages while decreasing access to unhealthy choices can help foster healthy habits early in life. Policies including the development of nutrition standards for food and beverages provided at school venues, in school cafeterias and vending machines are important contributors to healthy eating. Such policies exist in the U.S., U.K., throughout Europe and in parts of Canada. Research has demonstrated that these policies are associated with increased fruit and vegetable consumption, decreased calorie intake and in some cases, weight loss among students.^{57,58}

Schools can offer guidance to parents and students regarding healthy bag lunches and snacks. Making healthy food (particularly vegetables and fruit) readily available through supporting and participating in programs that help bring healthy food to schools (e.g., Farm to Cafeteria Canada's Farm to Schools program, FoodShare, and Breakfast for Learning) and the establishment of school community gardens have been shown to educate students on the importance of healthy eating, improve nutritional quality of the diet and help foster life skills.⁵⁹⁻⁶¹ Using healthy foods and beverages or non-food alternatives for school fundraising efforts are additional ways to limit availability of unhealthy foods.

Marketing to children

Children are particularly vulnerable to advertising and marketing messages. Marketing of foods and beverages is associated with higher levels of junk food consumption and obesity.^{33,62-64} In addition, product placement of sugary foods and sugar-loaded beverages influences children and consumer's choices. Restrictions on marketing to children have been cited as the most cost effective approach to reduce childhood obesity.^{65,66} Energy dense, nutrient poor products and sugar-loaded drinks should not be placed at children's eye level or at check-out locations. Instead, healthy products should be placed in highly visible areas.

Recognizing the connection between product placement and unhealthy eating habits in children, Tesco, a major European grocery chain has adopted a policy that removes sugary foods and beverages from placement at children's eye level. Indigo Books, a Canadian retail chain with over 300 bookstores across Canada, has also removed all processed food items including confectionaries from the cash register or 'impulse section' of stores.

Other policies

Increased access to healthy foods is important for health. In Canada 12.2 per cent of Canadian households experience food insecurity.⁶⁷ Local food procurement initiatives and the improvement of food distribution networks can increase access to healthy food (particularly traditional food) for First Nations, Inuit, and Métis populations, as well as others living in northern, remote and rural communities.

Nutrition North Canada is a food subsidy program in isolated northern locations that is funded by the Federal government. The program seeks to improve access to perishable healthy foods, including fresh, frozen, and refrigerated foods with a shelf-life of less than one year. A higher subsidy applies to the most nutritious options such as fresh fruit, frozen vegetables, bread, meat, milk and eggs. A lower subsidy applies to other eligible foods such as flour, crackers, ice cream and combination foods (e.g., pizza and lasagna).

Development of agricultural policies and subsidies that provide incentives for the production and distribution of healthy foods (particularly vegetables and fruit) will help to improve accessibility and affordability. Access to healthy unprocessed foods can also be improved through the establishment of Food Policy Councils and Food Charters that promote and develop local policies, programs and strategies. Community venues and programs such as community gardens, community kitchens, local food distribution networks, community supported agriculture, and school meal programs can help improve access to healthy foods. Policies and zoning by-laws designed to promote the establishment of grocery stores and other venues (e.g., farmers' markets, community gardens, community kitchens, etc.) can provide affordable access to healthy food, particularly in areas of low availability. Research shows that proximity to fast food outlets and access to fresh food markets are determinants of dietary habits and obesity.^{63,68-71}



Adopting a sugar tax on foods and beverages which are high in sugar is thought to be one of the most cost effective tools to change consumption patterns.⁷¹ The sugar tax should be an excise tax and be based on free sugars per unit. A tax of 5 cents per 100 mL on SSBs would raise \$1.8 billion in tax revenue annually.²⁹ Revenues from such a taxation stream should be used to subsidize vegetables and fruit to make healthy eating more affordable.

Policy strategies to support public health efforts to create healthier food systems can also help reduce free sugars consumption. Free sugars content can be reduced in the food environment through a variety of approaches. Reformulating food products to reduce sugar, sodium and fat content (healthier products) and bringing to market new products which support the goal of improving the healthfulness of foods and beverages are important strategies for the food industry. Companies can diversify to develop healthier products that are lower in free sugars, unhealthy fats, and sodium. Reductions in portion sizes can contribute to reduced sugar consumption. Ensuring that portions and prices are in alignment so as to not promote overconsumption, making the healthy choice the less expensive choice and promoting these healthier choices are approaches being taken in the U.K. as part of the government's Responsibility Deal, which aims to change the food environment and reduce poor health outcomes.

Up to 80 per cent of early heart disease and stroke can be prevented through adopting healthy behaviours including eating a healthy diet. Heart disease and stroke prevention requires a multi-pronged approach. Evidence shows that policy interventions which create healthy supportive environments are the most cost effective option because they are population based, have the greatest impact in terms of sustainable behaviour change and require smaller resource allocation. In addition to policy interventions, health promotion and health education initiatives are required to disseminate healthy living information, and raise public awareness. Ultimately, this multi-pronged package of sugar reduction initiatives will help make the healthy choice the easy choice for Canadians.





REFERENCES

1. Statistics Canada. Table 102-0529 - Deaths, by cause, Chapter IX: Diseases of the circulatory system (100 to 199), age group and sex, Canada, annual (number), CANSIM (database). Released January 28, 2014. <http://www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=1020529&pattern=102-0521..102-0538&tabMode=dataTable&srchLan=-1&p1=-1&p2=31>
2. Public Health Agency of Canada. Tracking Heart Disease and Stroke in Canada, 2009. Ottawa, Canada: 2009. Retrieved from: www.phac-aspc.gc.ca/publicat/2009/cvd-avc/pdf/cvd-avs-2009-eng.pdf
3. Public Health Agency of Canada. Tracking Heart Disease and Stroke in Canada – Stroke Highlights 2011. Ottawa, Canada: 2011. Retrieved from: <http://www.phac-aspc.gc.ca/cd-mc/cvd-mcv/shfs-2011/index-eng.php>
4. Statistics Canada. Canada Health Measures Survey – Body composition of Canadian adults, 2009-2011. Ottawa, Canada: 2012. Retrieved from: <http://www.statcan.gc.ca/pub/82-625-x/2012001/article/11708-eng.htm>
5. Roberts KC, Shields M, de Groh M, Aziz A, Gilbert J. Overweight and obesity in children and adolescents: Results from the 2009 to 2011 Canadian Health Measures Survey. *Health Reports* 2012;23(3):3-7.
6. Serdula MK, Ivery D, Coates RJ, Freedman DS, Williamson DF, Byers T. Do obese children become obese adults? A review of the literature. *Preventive Medicine* 1993;22(2):167-77.
7. World Health Organization. Guideline: Sugars intake for adults and children. Draft guidelines on free sugars released for public consultation, 5 March 2014.
8. Brisbois TD, Marsden SL, Anderson GH, Sievenpiper JL. Estimated intakes and sources of total and added sugars in the Canadian diet. *Nutrients* 2014;6:1899-1912.
9. Srinivasan CS, Irfan X, Shankar B. An assessment of the potential consumption impacts of WHO dietary norms in OECD countries. *Food Policy* 2006;31:53-77.
10. Yang Q, Zhang Z, Gregg WE, Flanders WD, Merritt R, Hu FB. Added sugar intake and cardiovascular diseases mortality among US adults. *JAMA Internal Medicine*. Published online February 3, 2014.
11. Johnson RK, Appel LJ, Brands M, Howard BV, Lefevre M, Lustig RH, Sacks F, Steffan LM, Wylie-Rosett J on behalf of the American Heart Association Nutrition Committee of the Council on Nutrition, Physical Activity, and Metabolism and the Council on Epidemiology and Prevention. Dietary Sugars Intake and Cardiovascular Health: A scientific statement from the American Heart Association. *Circulation* 2009;120:1011-20.
12. Liu S, Willett WC, Stampfer MJ et al. A prospective study of dietary glycemic load, carbohydrate intake and risk of coronary heart disease in US women. *American Journal of Clinical Nutrition* 2000;71:1455-61.
13. Bray GA, Nielsen SJ, Popkin BM. Consumption of high-fructose corn syrup in beverages may play a role in the epidemic of obesity. *American Journal of Clinical Nutrition* 2004; 79:537-543.
14. Pollock NK, Bundy V, Kanto W, Davis CL, Bernard PJ, Zhu H, Gutin B, Dong Y. Greater fructose consumption is associated with cardiometabolic risk markers and visceral adiposity in adolescents. *Journal of Nutrition* 2012;142(2):251-7.
15. Sievenpiper JL, de Souza RJ, Mirrahimi A et al. Effect of Fructose on Body Weight in Controlled Feeding Trials: A Systematic Review and Meta-analysis. *Annals of Internal Medicine* 2012; 156:291-304.
16. Te Morenga L, Mallard S, Mann J. Dietary sugars and body weight: systematic review and meta-analyses of randomised controlled trials and cohort studies. *British Medical Journal* 2012;345:e7492.
17. Wang H, Steffen LM, Zhou X, Harnack L, Leupeeker RV. Consistency between increasing trends in added-sugar intake and body mass index amount adults: The Minnesota Heart Survey, 1980-1982 to 2007-2009. *American Journal of Public Health* 2013;103:501-507.
18. Basu S, Yoffe P, Hills N, Lustig RH. The relationship of sugar to population-level diabetes prevalence: an econometric analysis of repeated cross-sectional data. *PLoS One* 2013; 8:e57873.
19. Cozma AI, Sievenpiper JL, de Souza RJ et al. Effect of Fructose on Glycemic Control in Diabetes: A systematic review and meta-analysis of controlled feeding trials. *Diabetes Care* 2012; 35:1611-1620.
20. Davis JN, Ventura EE, Weigensberg MJ, Ball GDC, Shaibi GQ, Goran MI. The relation of sugar intake to cell function in overweight Latino children. *American Journal of Clinical Nutrition* 2005;82:1004-1010.
21. Gross LS, Li L, Ford ES, Liu S. Increased consumption of refined carbohydrates and the epidemic of type 2 diabetes in the United States: an ecologic assessment. *American Journal of Clinical Nutrition* 2004;79:774-779.
22. Janket SJ, Manson JE, Sesso H, Buring JE, Liu S. A prospective study of sugar intake and risk of type 2 diabetes in women. *Diabetes Care* 2003; 26:1008-1015.
23. Sievenpiper JL, Carleton AJ, Chatha S et al. Heterogeneous effects of fructose on blood lipids in individuals with type 2 diabetes: systematic review and meta-analysis of experimental trials in humans. *Diabetes Care* 2009; 32:1930-1937.
24. Welsh JA, Sharma A, Abramson JL, Vaccarino V, Gillespie C, Vos MB. Caloric sweetener consumption and dyslipidemia among US adults. *Journal of the American Medical Association* 2010;303(15):1490-1497.



25. Larsson SC, Bergkvist L, Wolk A. Consumption of sugar and sugar-sweetened foods and the risk of pancreatic cancer in a prospective study. *American Journal of Clinical Nutrition* 2006;84:1171-1176.
26. Moynihan PJ, Kelly SAM. Effect on caries of restricting sugars intake: Systematic review to inform WHO guidelines. *Journal of Dental Research* 2014;93:8-18.
27. Brownell KD, Farley T, Willett WC, Popkin BM, Chaloupka FJ, Thompson JW, Ludwig DS. The public health and economic benefits of taxing sugar sweetened beverages. *New England Journal of Medicine* 2009;361(16):1599-1605.
28. World Health Organization. WHO opens draft consultation on draft sugars guideline: note for media. March 5, 2014. Retrieved from: www.who.int/mediacentre/news/notes/2014/consultation-sugar-guideline/en
29. Buhler S, Raine KD, Arango M, Pellerin S, Neary NE et al. Building a strategy for obesity prevention one piece at a time: The case of sugar-sweetened beverage taxation. *Canadian Journal of Diabetes* 2013;37(2):97-102. Erratum published August 2014.
30. Garriguet D. Beverage consumption of children and teens. *Health Matters* 2008;19(4):1-6.
31. Singh GM, Micha R, Katibzadeh S, Lim S, Ezzati M, Mozaffarian D on behalf of the Global burden of diseases, injuries, and risk factors nutrition and chronic diseases expert group. Mortality due to sugar sweetened beverage consumption: A global, regional and national comparative risk assessment. Abstract MP22 presented at American Heart Association (AHA) EPI/NPAM Scientific Sessions, New Orleans, March 2013.
32. US Department of Health and Human Services. Dietary Guidelines for Americans 2005.
33. Institute of Medicine of the National Academies. Dietary Reference Intakes: The essential guide to nutrient requirements. The National Academies Press, Washington DC, 2006.
34. Faculty of Public Health of the Royal College of Physicians of the United Kingdom. Sugar: A position statement. June 2007. Retrieved from: www.fph.org.uk/uploads/ps_sugar.pdf
35. Action on Sugar. Action on Sugar Website, Aims web page. Retrieved from: www.actiononsugar.org Accessed June 5, 2014.
36. Società Italiana di Nutrizione Umana. Livelli di Assunzione di Riferimento di Nutrienti ed energia per la popolazione italiana - Italian Recommended Energy and Nutrients Intake Levels. Revised 2012.
37. Food Standards Agency (UK & Scotland). Food Standards Agency: Voluntary recommendations on saturated fat and added sugar reductions and on portion-size availability for biscuits, cakes, pastries, buns, chocolate confectionary and soft drinks. 2010.
38. Stephen A, Alles M, de Graaf C et al. The role and requirements of digestible dietary carbohydrates in infants and toddlers. *European Journal of Clinical Nutrition* 2012;66:765-779.
39. Heart and Stroke Foundation. Vegetable and Fruit Consumption and Heart Disease and Stroke. August 2013. Retrieved from: www.heartandstroke.ca/positionstatements
40. Malik VS, Popkin BM, Bray GA, Despres JP, Hu FB. Sugar-sweetened beverages, obesity, type 2 diabetes mellitus and cardiovascular disease risk. *Circulation* 2010;121:1356-64.
41. Schultz MB, Manson JE, Ludwig DS, Colditz GA, Stampfer MJ, Willett WC, Hu FB. Sugar-sweetened beverages, weight gain, and incidence of type 2 diabetes in young and middle-aged women. *Journal of the American Medical Association* 2004;292(8):927-34.
42. Fung TT, Malik V, Rexrode KM, Manson JE, Willett W, Hu FB. Sweetened beverage consumption and risk of coronary heart disease in women. *American Journal of Clinical Nutrition* 2009;89:1037-42.
43. de Koning L, Malik VS, Kellogg MD, Rimm EB, Willett WC, Hu FB. Sweetened beverage consumption, incident coronary heart disease, and biomarkers of risk in men. *Circulation* 2012;125(14):1735-41.
44. Chiuve SE, Fung TT, Rimm EB, Hu FB, McCullough ML, Wang M, et al. Alternative dietary indices both strongly predict risk of chronic disease. *Journal of Nutrition* Published ahead of print April 18, 2012. doi: 10.3945/jn.111.15722.
45. Langlois K and Garriguet D. Sugar consumption among Canadians of all ages. *Health Reports* 2010;22(3):1-5.
46. Conference Board of Canada. What's to Eat? Improving Food Literacy in Canada. Report, October, 2013.
47. Barton Adrianna. Brazil takes an unambiguous new approach to fighting fat. *Globe and Mail*. March 16, 2014. Retrieved from: www.theglobeandmail.com/life/health-and-fitness/health/brazil-takes-an-unambiguous-new-approach-to-fighting-fat/article17496796
48. Nestle Marion Nestle. Food Politics, Brazil's new dietary guidelines: food-based! Retrieved from: www.foodpolitics.com/2014/02/brazils-new-dietary-guidelines-food-based/
49. U.S Food and Drug Administration. Nutrition Facts Label: Proposed Changes Aim to Better Inform Food Choices. February, 2014. Retrieved from: <http://www.fda.gov/downloads/ForConsumers/ConsumerUpdates/UCM387431.pdf>
50. U.S. Food and Drug Administration. Overview of FDA Proposed Labeling Requirements for Restaurants, Similar Retail Food Establishments and Vending Machines. Retrieved from: www.fda.gov/Food/IngredientsPackagingLabeling/LabelingNutrition/ucm248732.htm
51. DiMeglio DP, Mattes RD. Liquid versus solid carbohydrate: effects on food intake and body weight. *International Journal of Obesity and Related Metabolic Disorders* 2000;24(6):794-800.
52. Mattes RD. Dietary compensation by humans for supplemental energy provided as ethanol or carbohydrate in fluids. *Physiol Behav* 1996;59(1):179-187.



53. Elbel B, Cantor J, Mijanovich T. Potential effect of the New York City policy regarding sugared beverages. *New England Journal of Medicine* 2012;367:680–681.
54. Wang CY, Vine SM. Caloric effect of a 16-oz (473 mL) portion-size cap on sugar-sweetened beverages served in restaurants. *American Journal of Clinical Nutrition* 2013;98:430–435.
55. Yale Rudd Center for Food Policy and Obesity. Sugar-sweetened beverages initiatives since 2009. Updated January 2013. www.yaleruddcenter.org/resources/upload/docs/what/policy/SSBtaxes/SSB_Initiatives_since_2009.pdf
56. Muckelbauer R, Libuda L, Clausen K, Toschke AM, Reinehr T, Kersting M. Promotion and provision of drinking water in schools for overweight prevention: randomized, controlled cluster trial. *Pediatrics* 2009;123(4):e661–667.
57. Jaime PC, Lock K. Do school based food and nutrition policies improve diet and reduce obesity? *Preventive Medicine* 2009;48(1):45–53.
58. Nanney MS, MacLehose R, Kubik MY, Davey CS, Coombes B, Nelson TF. Recommended school policies are associated with student sugary drink and fruit and vegetable intake. *Preventive Medicine* 2014;62:179–181.
59. Robinson-O'Brien R, Story M, Heim S. Impact of garden-based youth nutrition intervention programs: a review. *J Am Diet Assoc*. 2009;109(2):273–280.
60. Heim S, Stang J, Ireland M. A garden pilot project enhances fruit and vegetable consumption among children. *J Am Diet Assoc*. 2009;109(7):1220–1226.
61. Parmer SM, Salisbury-Glennon J, Shannon D, Struempfer B. School gardens: an experiential learning approach for a nutrition education program to increase fruit and vegetable knowledge, preference, and consumption among second-grade students. *J Nutr Educ Behav* 2009;41(3):212–217.
62. Dietz W. New Strategies to Improve Food Marketing to Children. *Health Affairs* 2013;32(9):1652–1658.
63. Raine K, Lobstein T, Landon J, Kent M, Pellerin S, Caulfield T, Finegood D, Mongeau L, Neary N, Spence J. Restricting marketing to children: Consensus on policy interventions to address obesity. *Journal of Public Health Policy* 2013;34:239–253.
64. Dhar T, Baylis K. Fast Food Consumption and the Ban on Advertising Targeting Children: The Quebec Experience. *Journal of Marketing Research* 2011;98:799–813.
65. Magnus A, Haby MM, Carter R, Swinburn B. The cost-effectiveness of removing television advertising of high-fat and or high sugar food beverages to Australian children. *International Journal of Obesity* 2009;33:1094–1102.
66. Haby MM, Vos T, Carter R, Moodie M, Markwick A, Magnus A, Tay-Teo KS, Swinburn B. A new approach to assessing the health benefit from obesity interventions in children and adolescents: the assessing cost-effectiveness in obesity project. *International Journal of Obesity* 2006, 30:1463–1475.
67. PROOF. Research to identify policy options to reduce food insecurity. Unpublished analysis of 2011 Canadian Community Health Survey Data. Accessed June 3, 2014. Retrieved from: <http://nutritionalsciences.lamp.utoronto.ca/food-insecurity/>
68. Fiechtner LG, Block JP, Melly SJ, Sharifi M, Marshall R, Taveras EM. Proximity to Supermarkets Modifies Intervention Effects on Diet and Body Mass Index Changes in an Obesity Randomized Trial. Paediatric Academic Societies annual meeting: May 3, 2014.
69. Veugelers PJ, Sithole F, Zhang S, Muhajarine N. Neighborhood characteristics in relation to diet, physical activity and overweight of Canadian children. *International Journal of Pediatric Obesity* 2008;3(3):152–9.
70. Larson NI, Story MT, Nelson MC. Neighborhood environments: Disparities in access to healthy foods in the U.S. *American Journal of Preventive Medicine* 2009;36(1):74–81.
71. Powell LM, Chiqui JF, Khan T, Wada R and Chaloupka FJ. Assessing the potential effectiveness of food and beverage taxes and subsidies for improving public health: A systematic review of prices, demand and body weight outcomes. *Obesity Reviews* 2013;14: 110–128.

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