

# TOPO

SUMMARIES BY THE NUTRITION • PHYSICAL ACTIVITY • WEIGHT TEAM

ISSUE 3 • MARCH 2013

## In this issue

### Why tax sweetened beverages?

**What if taxes were earmarked for funding programs instead of changing eating behaviour?**

**What are the economic issues associated with the taxation of sweetened beverages?**

## What is *TOPO*?

The *Topo* collection is produced by the multidisciplinary team on nutrition, physical activity, and weight-related problems prevention (*Nutrition, activité physique et prévention des problèmes reliés au poids* or NAPP)<sup>1</sup> at the Institut national de santé publique du Québec (INSPQ). The collection disseminates knowledge to inform the choices of practitioners and decision makers in the prevention of weight-related problems. Each issue addresses a theme and combines a critical analysis of the relevant scientific literature with observations or illustrations that can assist in applying this knowledge in the Québec context. The *TOPO* collection may be found at <http://www.inspq.qc.ca/topo>.

## Taxation of sweetened beverages: An economical perspective

The taxation of food products, such as sweetened beverages, is one method that is being considered to change eating behaviours and consequently help improve the populations' health. However, very few empirical studies have been conducted on the use of fiscal measures to prevent obesity and chronic diseases. While most experts recognize the need to take action to reduce the consumption of sweetened beverages in Québec, many wonder if taxation is an interesting tool to reach this goal. Behavioral economics is a useful approach to critically study the implementation of this type of measure. It is from this angle that *TOPO*'s editorial team chose to expose a few economic principles that may help public health practitioners get a clearer picture of the issue at hand.

The goal of this *TOPO* is not to take a stand on taxation, but, from a public health perspective, to include economic considerations in the public health reflection on the relevance of imposing a tax on sweetened beverages.

<sup>1</sup> The NAPP team is mandated to develop expertise on the issue of weight to support and assist the public health network's efforts in this field. The NAPP team is part of the Habitudes de vie unit, in the Direction du développement des individus et des communautés of the INSPQ.

## Why tax sweetened beverages?

### THE CONSUMPTION OF SWEETENED BEVERAGES POSES A HEALTH RISK

Scientists have many reasons to believe that the consumption of these products may have adverse health effects for the population in general. For example, several American studies have linked the consumption of sweetened beverages to subsequent weight gain. This suggests that a high consumption of these beverages could increase the risk of obesity.<sup>(1)</sup> A higher consumption of soft drinks is also linked to a lower consumption of milk and a lower intake of various nutrients such as calcium.<sup>(2)</sup> Aside from obesity, the consumption of sweetened beverages has also been associated to an increased risk of Type 2 diabetes, cardiovascular disease, and metabolic syndrome.<sup>(3)</sup> However, the causal relationship between the consumption of sweetened beverages and the incidence of chronic diseases has yet to be scientifically demonstrated.

#### What about corn syrup in all this?

In the North American agri-food industry, there is widespread use of high-fructose corn syrup as an alternative to sugar in soft drinks. Concerns have been expressed that this sweetener may contribute to some of the negative consequences (insulin resistance, obesity) associated with soft drink consumption. However, current knowledge does not confirm that the consumption of corn syrup has a more negative impact than sugar consumption on the risk of metabolic, cardiovascular, or weight problem.<sup>(4)</sup>

### SWEETENED DRINKS ARE VERY MUCH A PART OF THE EATING HABITS OF THE QUÉBEC POPULATION

A 2004 survey reported that 38% of Québec adults had consumed soft drinks during the day preceding the survey.<sup>(5)</sup> Even among very young children, the consumption of sweetened beverages is cause for concern. A 2002 survey revealed that 20% of four year olds consume sweetened beverages on a daily basis.<sup>(6)</sup>

## What if taxes were earmarked for funding programs instead of changing eating behaviour?

### THE TAXATION OF FOOD PRODUCTS IN QUÉBEC

In so-called industrialized countries, it is not rare for consumers to pay taxes when they purchase food items. In Québec, for example, most basic food items (fruits, vegetables, milk products, etc.) are tax-exempt as opposed to the majority of processed foods. Sweetened beverages are therefore normally subjected to federal and provincial sales taxes, with the exception of fruit beverages containing 25% or more natural fruit juice in 600-ml or larger formats. The mechanism determining how a fiscal measure is applied varies from one country to the next as does the legislation pertaining to food items. Thus, in certain jurisdictions, the same food items are subject to different tax rates depending on whether they are purchased in a restaurant or a supermarket.

Throughout the world, taxes on food items are applied according to various formulations. These can range from a fixed amount per container purchased (\$1 per bottle), a tax based on a percentage of the product's value (5% of the sale price), or a tax calculated on the basis of the content of one of its ingredients (\$0.05 per gram of sugar). In the food industry, the introduction of a measure involving the price of ingredients is more demanding in terms of documentation, implementation, and control than a measure involving the price of a food item. Experts are not fond of the idea of taxing ingredients as it is perceived to be politically impractical from a legislative point of view.<sup>(7-8)</sup>

### Defining the concept of “sweetened beverage” is not simple

There is no consensus among experts on the definition of products that must be included in the sweetened beverage category. Some include diet drinks, others include energy drinks, and many studies consider soft drinks alone. For the purpose of this *TOPO*, we have chosen to consider all drinks that have water and added sugar as primary ingredients since scientific evidence concerning the impact of high-calorie drinks on health is stronger. From a legislative point of view, the concept of “sweetened beverage” has not been formally defined in Québec law as opposed to the term “soft drinks,” which has been defined as being aerated water to which an essence or syrup has been added.<sup>(9)</sup>

### THE DIFFERENT GOALS OF TAXATION

The goals of measures such as imposing taxes are either to modify prices and consequently influence the choices consumers make, to generate revenue to finance government activities, or, in the case of a dedicated tax, to finance a particular project, program, or policy. Ultimately, these measures can be assumed directly by the consumer (a sales tax or a deposit for example) or indirectly by a bottling company, distributor, or importer (an excise tax, for example).

- The ideal level of taxation is linked to its goal; its impact will depend on the size of the tax and consumer reaction to the price changes.
- If a dedicated tax is implemented to finance a project, a significant price increase could, in the end, reduce the sales of the products taxed and, at the same time, limit the effectiveness of the measure as a source of funding.
- If the goal of a tax is to influence consumers’ food choices, a price modification that is too modest could result in no significant impact on the population as a whole.

Given the precarious economic context currently influencing the state of public finances, there should be no surprise that a tax on sweetened beverages is introduced to generate revenue to fund government activities. Because of this, it will be more difficult to use taxation as a way to have an impact on the population’s dietary habits without contributing to a decrease in financing revenue. The application of a tax earmarked to fund a program that promotes healthy living habits can, in this situation, be seen as an acceptable compromise between the Ministère des Finances interests and the concerns public health experts have about the population’s health.

### OPINIONS SURROUNDING THE EFFECTIVENESS OF TAXES ON DIETARY HABITS ARE FAR FROM UNANIMOUS

Unlike taxes introduced to generate public funds that have already proven to be successful, a national tax on sweetened beverages would have little impact population-wide on the consumption of this type of product.<sup>(10-12)</sup> These results are not surprising since researchers have mostly studied the application of taxes under 20% and that recent initiatives have not yet been evaluated. In contrast to fiscal measures affecting the tobacco and alcoholic beverage sector, the introduction of a small-scale tax on sweetened beverages has been the most extensively studied initiative. This is because if the revenue is used to fund public health programs, such a tax would be supported by consumers, according to expert analysis.<sup>(7)</sup>

Economic measures that appear to have the greatest potential to affect the population’s dietary habits are price interventions applied to closed settings.<sup>(13-14)</sup> A price policy in which water is much less expensive than sweetened beverages in an skating arena’s vending machines is one example of a promising measure to reduce sales of sweetened beverages in this setting. Although encouraging, these results are insufficient to proclaim the efficiency of a large-scale tax on the population’s consumption habits and weight. For example, it is difficult to determine whether a significant proportion of the population will be affected by a measure applied in skating arenas or if consumers will compensate by purchasing their sweetened beverages elsewhere.



## **THE IMPACT OF A TAX CAN VARY AMONG DIFFERENT POPULATION SEGMENTS**

Economic research evaluating the taxation of sweetened beverages is often based exclusively on mathematical modelling techniques. It is therefore very difficult for these predictions to consider the complexity of and specific characteristics associated with different groups affected by the tax such as consumers, youth, or low-income households. For example, several studies demonstrate that it seems realistic to anticipate positive effects of a tax on sweetened beverages on certain groups. Heavy soft drink consumers would have a stronger response to price modifications than occasional soft drink consumers. The scenarios proposed by Gustavsen<sup>(15)</sup> demonstrate that a tax could lead to reductions in annual soft drink consumption, at the very most, of 2 litres among moderate drinkers and of 74 litres among those who are heavy drinkers.

## What economic issues are associated with the taxation of sweetened beverages?

### **PRICE IS NOT THE ONLY VARIABLE THAT INFLUENCES CONSUMER CHOICES**

In theory, the ultimate goal of evaluating the impact of a tax is not only to show that consumers are sensitive to price changes affecting sweetened beverages, but also to analyze taxation as a measure that contributes to a significant change in the population's dietary habits or weight. This distinction is important since the reaction of consumers in Québec to price changes pertaining to sweetened beverages is not well documented.

- If a tax on sweetened beverages is introduced, it is possible that consumers will continue to purchase these products, especially if this expense does not represent a significant proportion of their available income.
- Consumers will not necessarily replace the sweetened beverages they already consume with more nutritious products, particularly if they substitute them with the equivalent quantity of diet beverages.
- Certain consumer groups may also absorb the cost of a tax on sweetened beverages by reducing their other food expenditures.

Furthermore, price is not the only variable that leads consumers to choose sweetened beverages. The impact of marketing, packaging, and product placement in stores must also be evaluated and documented.

### **THE IMPACT OF SUBSTITUTES AND COMPLEMENTARY PRODUCTS MUST BE CONSIDERED**

Most sweetened beverages are similar in terms of nutritional quality, taste, and packaging. For consumers, they are easily interchangeable. Substitutes can be chosen from among products in different categories (fruit beverage versus sports drink versus soft drink), products within the same category (regular beverage versus diet beverage), or brands within a certain segment (national brand versus house brand). When several substitutes for the same range of product are available, the demand for these products tends to be elastic. Thus, a price increase for a particular type of beverage (soft drinks, for example), will theoretically have a positive effect on the sale of other types of sweetened beverages and minimize the population's health benefits with respect to this intervention.<sup>(16)</sup>

- Consumer reaction to price changes is linked to price elasticity of demand.
- If a dedicated tax is implemented to finance a project, it must be applied to a product or group of products for which demand tends to be inelastic, since the success of such a measure requires sustained and stable purchasing.
- If the objective of a tax is to influence consumers' dietary choices, it must be applied to a product or group of products for which the demand tends to be elastic, since the success of such a measure requires reduced purchasing.

### What is price elasticity of demand?

A product's price elasticity is measured by observing the variation in its sales volume when its price varies. When demand tends to be elastic, a slight price increase will cause a sharp decline in purchases. On the other hand, demand tends to be inelastic when a significant price increase results in a slight decrease in purchases.<sup>(17)</sup> Price elasticity of demand can be measured aggregate (for all food items), for a product category (all sweetened beverages, for example), or for a specific product (diet cola, for example). This distinction is important because the demand for one type of sweetened beverage tends to be elastic while the demand for sweetened beverages as a whole tends to generally be much less elastic.

Substitute products are not alone in influencing food consumption habits; complementary products, which are rarely consumed independently, also have an impact. Sweetened beverages, whether they are regular or diet, are likely to be consumed with several complementary products. Thus, there is reason to question the impact that drinking sweetened beverages may have on the purchase of other unhealthy food items such as chips or other fried foods. For example, Tefft's studies<sup>(18)</sup> showed that the introduction of a tax on sweetened beverages could also result in a reduction in snack food purchases among American consumers. The reverse train of thought is also relevant since a company that markets both soft drinks and chips could offset the effects of a tax on sweetened beverages by introducing a campaign to promote its chip sales.

### TAXATION REMAINS A REGRESSIVE MEASURE

Evaluation of the overall effectiveness of a measure like taxation, must consider its impact on vulnerable groups to ensure that, in the end, it doesn't increase their burden in spite of good intentions. Whether an increase of the sales tax on food items or the introduction of an excise tax is involved, these forms of indirect income tax may prove to be inequitable. Such interventions are ultimately paid by everyone, regardless of income, and do not reflect the fact that consumers from economically disadvantaged settings spend a larger portion of their income on food than wealthier families. Taxes are regressive measures because they have a greater impact on disadvantaged groups, unless it can be demonstrated that the products in question are consumed primarily by the wealthiest members of society.<sup>(19)</sup>

To offset this regressive effect, the government could, for example, commit to redistributing part of the revenue generated by taxation through initiatives aimed at improving the eating habits of disadvantaged groups. In this case, the lack of data on the impact of sweetened beverages on the health of the Québec population makes it difficult to justify the calculations required to establish the monetary threshold at which redistribution would offset the regressive effects associated with the introduction of a new tax.

## Conclusion

Of course, no single measure by itself will stabilize the increase in overweight within the Québec population. Likewise, economic evaluations are not the only data relevant when selecting a strategy to promote healthy lifestyle habits. All experts recognize that a combination of multiple health, political, legislative, and economic interventions is required to provide the best chance for success when it comes to improving dietary habits and, ultimately, the population's health. The role of taxation in solving this issue is thus dependent upon its complementarity with other strategies introduced to promote healthy lifestyle habits and prevent obesity.

Scientific literature, from an economic perspective or not, does not provide clear answers on the effectiveness of taxes in reducing the consumption of sweetened beverages among the Québec population. Nonetheless, the principles outlined in this *TOPO* will enable public health practitioners called upon to provide input on the issue, to incorporate certain economic considerations as part of a broader reflection on the relevance of taxing sweetened beverages.

**Table 1 Important economic considerations**

<b>Taxation can fulfill different goals</b>	If a dedicated tax is implemented to finance a project, a dramatic price increase could, in the end, limit the effectiveness of the measure as a funding source.
	If the purpose of a tax is to have an impact on consumers' dietary choices, a price modification that is too modest could have no effect at all.
<b>Consumer reaction to price changes is linked to the price elasticity of demand</b>	If a dedicated tax is introduced to finance a project, it must target a product or a group of products for which the demand tends to be inelastic.
	If the purpose of a tax is to influence consumers' dietary choices, it must be applied to a product or group of products for which the demand tends to be elastic.
<b>The effects of taxation on sweetened beverages must be better documented</b>	If a tax on sweetened beverages is introduced, it is possible that consumers will continue to purchase these products.
	Consumers will not necessarily replace sweetened beverages they already consume with more nutritious products.
	Certain consumer groups could also absorb the cost of a tax on sweetened beverages by reducing their spending on other food expenditures.



## References

- (1) OLSEN, N. J., and B. L. HEITMANN (2009). "Intake of calorically sweetened beverages and obesity", *Obesity Reviews*, 10 (1), p. 68-75.
- (2) VARTANIAN, L. R., M. B. SCHWARTZ and K. D. BROWNELL (2007). "Effects of soft drink consumption on nutrition and health: a systematic review and meta-analysis", *American journal of Public Health*, 97 (4), p. 667-675.
- (3) MALIK, V. S., B. M. POPKIN, G. A. BRAY, J.-P. DESPRES and F. B. HU (2010). "Sugar-sweetened beverages, obesity, type 2 diabetes mellitus, and cardiovascular disease risk", *Circulation*, 121 (11), p. 1356-1364.
- (4) TAPPY, L. K. A. (2010). "Metabolic effects of fructose and the worldwide increase in obesity", *Physiological Reviews*, 90 (1), p. 23-46.
- (5) BLANCHET, C., C. PLANTE and L. ROCHETTE (2009). *La consommation alimentaire et les apports nutritionnels des adultes québécois*, Institut national de santé publique du Québec.
- (6) BÉDARD B., L. DUBOIS and M. GIRARD (2005). "Consommations alimentaires", In *Enquête de nutrition auprès des enfants québécois de 4 ans*, Institut de la statistique du Québec, chap. 5, p. 89-107.
- (7) JACOBSON, M. F. and K. D. BROWNELL (2000). "Small taxes on soft drinks and snack foods to promote health", *American Journal of Public Health*, 90 (6), p. 854-857.
- (8) SCHMIDHUBER, J. (2004). "The growing global obesity problem: some policy options to address it", *Electronic Journal of Agricultural and Development Economics*, [online], 1 (2), <http://ideas.repec.org/a/ags/ejedef/12003.html> (consulted April 25<sup>th</sup>, 2012).
- (9) GOUVERNEMENT DU QUÉBEC (2008). *Act respecting the Sale and Distribution of Beer and Soft Drinks in Non-Returnable Containers*, [online] [http://www2.publicationsduquebec.gouv.qc.ca/dynamicSearch/telecharge.php?type=2&file=/V\\_5\\_001/V5\\_001.HTM](http://www2.publicationsduquebec.gouv.qc.ca/dynamicSearch/telecharge.php?type=2&file=/V_5_001/V5_001.HTM) (consulted February 2<sup>nd</sup>, 2001).
- (10) CARAHER, M. and G. COWBURN (2005). "Taxing food: implications for public health nutrition", *Public Health Nutrition*, 8 (8), p. 1242-1249.
- (11) KUCHLER F., F. A. TEGUNE and J. M. HARRIS (2004). "Taxing snack foods: manipulating diet quality or financing information programs", *Review of Agricultural Economics*, 27 (1), p. 4-20.
- (12) FLETCHER, J.M., D. FRISVOLD and N. TEFFT (2010). "Can soft drink taxes reduce population weight?", *Contemporary Economic Policy*, 28 (1), p. 23-35.
- (13) FRENCH, S. A. (2003). "Pricing effects on food choices", *Journal of nutrition*, 133 (3), p. 841S-843S.
- (14) KIM D., and I. KAWACHI (2006). "Food taxation and pricing strategies to «thin out» the obesity epidemic", *American Journal of Preventive Medicine*, 30 (5), p. 430-437.
- (15) GUSTAVSEN, G. W. (2005). "Public policies and the demand for carbonated soft drinks: a censored quantile regression approach", European Association of Agricultural Economists-2005 International Congress, August 23 to 27, Copenhagen, Denmark.
- (16) CASH S. B., and R. D. LACANILAO (2007). "Taxing food to improve health: economic evidence and arguments", *Agricultural and Resource Economics Review*, 36 (2), p. 174-182.
- (17) MADORE, O. (2007). *Effet des mesures économiques pour favoriser une alimentation saine, encourager l'activité physique et combattre l'obésité*. Literature Review, Bibliothèque du parlement PRB 06-34F.
- (18) TEFFT N. W. (2006). "The effects of a snack tax on household soft drink expenditure", University of Wisconsin Working Paper.
- (19) SASSI, F., and J. HURST (2008). "The prevention of lifestyle-related chronic diseases: an economic framework", OECD Health Working Papers, n° 32.

### TAXATION OF SWEETENED BEVERAGES: AN ECONOMICAL PERSPECTIVE

#### AUTHOR

Catherine Gervais  
Développement des individus et des communautés

#### EDITORIAL BOARD

Johanne Laguë  
Développement des individus et des communautés  
Gérald Baril  
Développement des individus et des communautés  
Pascale Bergeron  
Développement des individus et des communautés  
Étienne Pigeon  
Développement des individus et des communautés  
Geneviève Beaugard  
Secrétariat général, communications et documentation

This document is available in its entirety in electronic format (PDF) on the Institut national de santé publique du Québec Web site at: <http://www.inspq.qc.ca>.

Reproductions for private study or research purposes are authorized by virtue of Article 29 of the Copyright Act. Any other use must be authorized by the Government of Québec, which holds the exclusive intellectual property rights for this document. Authorization may be obtained by submitting a request to the central clearing house of the Service de la gestion des droits d'auteur of Les Publications du Québec, using the online form at <http://www.droitauteur.gouv.qc.ca/en/autorisation.php> or by sending an e-mail to [droit.auteur@csqg.gouv.qc.ca](mailto:droit.auteur@csqg.gouv.qc.ca).

Information contained in the document may be cited provided that the source is mentioned.

LEGAL DEPOSIT – 1<sup>st</sup> QUARTER 2013  
BIBLIOTHÈQUE ET ARCHIVES NATIONALES DU QUÉBEC  
LIBRARY AND ARCHIVES CANADA  
ISSN: 1925-5748 (French PDF)  
ISSN: 2291-2096 (PDF)

©Gouvernement du Québec (2013)

The TOPO collection – Summaries by the Nutrition, Physical Activity, Weight Team was made possible thanks to a financial contribution from the Ministère de la Santé et des Services sociaux du Québec.

The translation of this publication was made possible with funding from the Public Health Agency of Canada.