

Dangers of sugar to your health

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ENORMOUS RISKS

We consume astronomical quantities of sugar.

Once used sparingly, sugar has become one of the principal ingredients of the modern diet. Almost nothing escapes it, whether the product is cereals, snacks, breads, salad dressings, sauces or yogurts, even when these products are sold in a version that is “low in fat”; a simple yogurt with no fats can contain up to 5 teaspoons of sugar!

Each day, the average Canadian consumes the equivalent of 26 teaspoons of sugar, a quantity that is 4 times higher than that recommended by the World Health Organization (6 teaspoons).

HEALTH PROBLEM

Research has clearly shown that this overconsumption of sugar is a way to develop one of the principal public health problems of the 21st century.

Obesity, cardiovascular disease, diabetes, cancer, cirrhosis of the liver and certain forms of dementia: all of these pathologies are very often direct consequences of metabolic derangement provoked by excess sugar in the diet.

For the processed food industry, sugar is just an ingredient which serves to improve the taste and texture of their products to increase sales and profits.

For the consumer, this excess sugar can be catastrophic for the health because our metabolism is completely unsuited for this superabundance of energy.

Before it becomes the tobacco of the 21st century, we must better understand what sugar is as well as the enormous risks that its excessive consumption poses for our health.

To reduce the sugar intake, the best way remains to keep as far away as possible from processed foods, whether they are “diet” or not, and to cook our own meals.

And above all else, avoid carbonated drinks at all cost!

PUBLIC ENEMY NUMBER 1



One 355 ml can = 39 g of sugar

One can per day over one year = 14.6 kg

Soft drinks are the most important source of sugar in our diets.

In Canada, soft drinks are the source of:

4% of sugar intake for children.

14% of sugar intake for adolescents.

On average.... Boys consume 68 g of ordinary soft drinks per day between the ages of 4 and 8, then **376 g per day** between the ages of 14 and 18. For **girls**, the daily consumption goes from 47 g to **179 g per day**.

A HARD DRUG

In the most extreme cases, our love of sugar develops into a dependence.

Several studies have clearly established that the activation of the brain's reward system by sugar shows considerable similarity to that evoked by drugs. For example, animals with a choice between a sugar drink and an intravenous dose of cocaine show a preference for the sugar.

In humans, it seems that certain people who frequently consume sugary foods (ice cream, for example) become tolerant to sugar, that is to say that they must later consume even larger amounts of sugar in order to obtain the same satisfaction they seek. Because tolerance to a substance is well known amongst drug abusers, some researchers have proposed that the overabundance of sugar in our diet could be addictive and could induce, in some people, a dependence similar to that associated with drug abuse.

The food industry has exploited our innate weakness for sugar to sell very sweet products, and it must be admitted that this attraction had developed over time into an addiction.

In other words, the taste of sugar has become ubiquitous in our lives, with 80% of the approximately 600,000 food products found in supermarkets containing added sugar.

Even though it is difficult to establish with precision the degree of dependence caused by sugar, it is certain that this potential exists, particularly when the chronic exposure begins at a very early age.

SUGAR, A NECESSITY

A simple truth should be kept in mind: sugar is essential to the normal functions of our bodies.

The brain, for example, represents only 2% of the body mass, but it consumes by itself 80% of all of the sugar which we consume each day. To be intelligent requires a lot of energy! We are thus biologically predisposed to like sugar, and when the receptors present in the tongue detect the presence of this substance, they release a wave of chemical messengers in the brain, notably dopamine, which activates the reward and pleasure systems there. It is thus completely normal to have a sweet tooth!

THE CULPRITS: THE ADDED SUGARS



Omnipresent

21% The average total intake of sugar in adult Canadians is about 110 g per day, or 21% of the total energy present in a diet comprising 2,000 calories per day.

35% Of these 110 g of sugar, 31% is provided by vegetables and fruit whereas 35% is derived from sources which are not part of the four food groups found in the Canadian Food Guide. Instead, this sugar comes from products such as soft drinks and candies which have a high content of added sugar.

80% No less than 80% of all processed food products contain sugar.

If a product label mentions terms such as sucrose, dextrose, corn syrup enriched in fructose, glucose-fructose, malt syrup, etc. all of these names indicate one and the same thing: sugar has been added to this product! And the earlier the name is shown in the list of ingredients, the greater the amount of it that is found in the product....

The principal types of added sugars are sucrose (table sugar) or corn syrup enriched in fructose (high fructose corn syrup, aka HFCS).

In both cases, the sugars are formed by combining a molecule of glucose with a molecule of fructose: the molecule named sucrose contains 50% glucose and 50% fructose whereas HFCS contains

45% glucose and 55% fructose. These two sugars are thus biochemically similar and their overconsumption leads in both cases to an excessive intake of glucose and of fructose.

Quantities of glucose which exceed the energetic needs are converted into fat and are subsequently incorporated into adipose tissue, which leads in time to an increase in body weight.

The management of excess fructose is even more problematic, because our metabolism is helpless when faced with this substance.

The surplus fructose is transformed into fat by the liver, which leads to significant derangement of blood lipids and an increased risk of cardiovascular diseases.

It has been estimated that nearly 25% of the American population exhibit excessive accumulation of fat around the liver (hepatic steatosis), which illustrates the extent to which the actual consumption of sugar exceeds the capacity of our bodies to efficiently manage this substance.

A BIG FAMILY!

For many people, the word “sugar” only refers to table sugar (sucrose) or to products such as honey or maple syrup. Yet it is not only the foods which taste sweet that contain sugar! In reality, there are several distinct types of sugar, and this family (carbohydrates) can be divided into three large categories:

- 1) **Dietary fibre.** These are polymers of sugar which are uniquely found in plant-based products such as vegetables, fruits and whole grains. These fibres are so complex that they resist digestion and it is only thanks to the bacteria present in our intestines that we are able to extract, via fermentation, a small quantity of their sugar content.
- 2) **Starches.** Also formed of an assembly of diverse sugar molecules, starch is, however, less complex than dietary fibre and its sugar content can be extracted by digestion. This sugar extraction from starch depends on its structure: for example, the starch of white bread or potatoes is degraded very quickly, whereas that of beans or whole grains is much more resistant.
- 3) **Simple sugars.** Historically, the simple sugars have only occupied a small space in our diet because they are only present in specific foods (fruits, milk, honey, maple syrup). It was not until the large-scale culture of sugar cane, and then of sugar beet, that the food industry managed to produce large quantities of these simple sugars (sucrose). Before this industrial revolution, a person annually consumed about 2 kg of sugar, compared to the current annual consumption of about 50 kg. Eating sugar is thus a very recent phenomenon!

TOO MUCH IS POISON

Just because a substance is essential to life doesn't mean that it is without danger: one can die by drinking too much water or by breathing excess oxygen. It is the dose which makes the poison.



Our body requires sugar in order to function, but like all forms of energy, it must be manipulated with plenty of precautions to avoid the occurrence of serious secondary effects. To make a simple analogy, gasoline is indispensable for the operation of an automobile, but it can become dangerous if its combustion is not carefully controlled by the vehicle's motor!

Our metabolism has developed ways to maintain the concentration of sugar at a level sufficient for the needs of the organism. And this level is much less than we think: on average, the blood of a person in good health contains a maximum of 4 to 5 g of sugar, which is the equivalent of a teaspoonful! When we consider that a simple can of soft drink itself contains 10 times this quantity of sugar, we can see the extent to which the sugar in our diet exerts a powerful force on our metabolism.

In elevated quantities, sugar possesses the ability to chemically link to proteins (Maillard reaction). This reaction is important in cooking, because it is the basis for the process of caramelization which produces the golden color of pies as well as the browning of meats. In the human body, on the other hand, the result of this reaction is less happy: the fixation of sugars to protein within the blood vessels modifies their function, which leads to the development of inflammatory conditions as well as a loss of elasticity which leads to an obstruction of the vessels (thrombosis). It is for these reasons that hyperglycemia favors the development of cardiovascular diseases: by chemically altering the contents of blood vessels, a prolonged excess of sugar in the blood leads to premature aging of these vessels, provoking a pathological "caramelization" with dramatic consequences.

WATCH THAT JUICE

Several studies have clearly shown that regular consumption of fruits is associated with a diminished risk of both heart diseases and certain cancers.

Fruits are not only sources of sugar: these plant products also contain a panoply of phytochemical products noted for their antioxidant and anti-inflammatory properties which produce numerous positive effects on the human body. The presence of significant quantities of fibre in these fruits also has the effect of slowing the absorption of the sugars they contain, permitting our metabolism to manage the sugar more effectively. Overall, there is no doubt that fruits are valuable allies in maintaining good health.



JUICE IS LIQUID SUGAR

These benefits are, however, less important when the fruit is consumed in the form of juice.

We often forget that a simple glass of juice contains the equivalent of 4 complete pieces of fruit, which considerably augments the quantity of sugar ingested whereas the juice doesn't contain the dietary fibre which slows sugar absorption.

Our metabolism has a great deal of difficulty in managing these large quantities of sugar ingested in liquid form, such as it obtain from processed, sugary drinks or from fruit juices, and it would thus be wise to drink these beverages in moderation.

One glass of fruit juice is evidently better for the health than a soft drink, but a piece of fruit remains by far the best choice.

ARE ARTIFICIAL SWEETENERS A SOLUTION?



No! There are three big reasons why "diet" drinks or foods containing artificial sweeteners are not the solution to the problem of excess weight which affects our society: 1) Foods which have been artificially sweetened change nothing in our habit of consuming sweet foods, which trains us to reject certain bitter foods (cruciferous vegetables and green tea, for example) which, themselves, produce important benefits for health. 2) Studies have suggested that the brain does not like it when we try to fool it with "fake sugars" which lack calories: in reaction, our appetite for other sugared foods is increased in such a way as to compensate for the absence of calories in the artificial sweeteners, which leads to caloric overdose. 3) Recent studies suggest that artificial sweeteners disturb the equilibrium of the intestinal microbial flora, which interferes with the normal metabolism of sugar and creates conditions conducive to the accumulation of fat.

RESPONSIBLE FOR THE OBESITY EPIDEMIC

To gain weight, all that is required is that the caloric intake be greater than the energy expended.



It is thus not surprising that the current epidemic of obesity coincides with a significant increase in the quantity of calories consumed by the population over the past 30 years. The omnipresence of sugar in modern processed foods plays an important role in this excessive consumption of calories.

CALORIC BOMBS

The best example of this is soft drinks, or other sugared beverages (energy drinks, vitamin waters, etc.): these drinks are essentially “caloric bombs” which represent for some people, particularly amongst youths, up to 15% of the daily caloric intake.

According to several studies, the consumption of these drinks is associated with weight gain, because the calories absorbed in liquid form do not activate the sense of satiety but instead simply add to the caloric intake from food.

The principal consequence of excess weight is to perturb the metabolism of sugar, particularly when the accumulation of fat is located around the abdomen. This surplus of fat completely reprograms the metabolism and prevents the sugar from properly entering the interior of cells: there is thus an increase in blood sugar (hyperglycemia) which forces the pancreas to produce greater quantities of insulin in compensation. With time, this difficulty in properly absorbing sugar can provoke an exhaustion of the pancreas, with a halt in the production of insulin and the advent of a chronic state of hyperglycemia.

One of the two grave dangers of being overweight is thus to develop type 2 diabetes, a disease which is extremely difficult to treat and which is associated with an important increase in the risk of heart disease, cancer and neurodegenerative disorders.

SUGAR DISEASES

The excessive consumption of sugar is associated with diverse health problems, including heart disease, strokes, obesity, diabetes, hypercholesterolemia, cancer and dental caries.

60%

More than 60% of Canadian adults and 31% of children and youths between 5 and 17 years of age are either overweight or actually obese.

The rate of obesity doubled between 1980 and 2000.

1 person in 12 has developed diabetes.

10%

The Heart and Stroke Foundation recommends that we consume no more than 10% of our daily energy intake (in calories) from sugars and even advises that we keep this below 5%.

According to the World Health Organization, **dental caries** are linked to a too high consumption of sugar and are particularly damaging to children.