Name: _____ Group: _____

THE CASE STUDY

Parliamentary session summary of proceedings

The Premier of Québec reiterated his resolve to eliminate junk food in Québec schools in an effort to help young people adopt healthy eating habits. An action plan is expected to be submitted to educational institutions soon. According to a Statistics Canada study, 60 percent of young people eat hot dogs and hamburgers once a week and 20 percent eat French fries three to six times a week.

Junk food also concerns many public health experts, who criticize Canada's lax food legislation. Observers estimate that the adoption of a new law to reduce the amount of trans fat, sugar and salt in food would reduce the effects of junk food. Some cereals sold in Canada contain up to 17 times more salt than similar products sold in foreign markets. Do Canadians have an unusually intense craving for salt?

Don't miss it!

The *Reporter* is working on a special show on junk food and young people. For four weeks, three teens shared what they ate for lunch with journalist Normand Légaré. What this experience revealed is that these young people are eating too much salt, sugar and fat. The journalist took a closer look at the effects of their diets. He has found out which organs, tissues and systems in the body are affected and suggests three new eating habits to the teens. On the show, he describes how these new habits will limit the negative effects of junk food on their organs and tissues. Don't miss the airing of this special presentation this January!

In this simulation exercise, you are to assume the role of journalist Normand Légaré and write a text for the broadcast. The text must propose three new eating habits and include a description of how these habits will limit the negative effects of junk food on tissues and organs involved in the process of nutrition. In order to complete the exercise, you must study the effects of the diet of one of the teens in question:

- John: a diet rich in salt
- Marsha: a diet rich in trans fat, saturated fat and cholesterol
- Gerry: a diet rich in sugar

Name: _____ Group: _____

CREATING THE CONTEXT

I ask myself questions

I must

I think

Name: _____ Group: _____

CREATING THE CONTEXT (*continued*)

What I know and what I must find out

What I know . . .	What I must find . . .

I prepare my work

Reflection

	Yes	No
Do I fully understand what I need to do?	☐	☐

Name: _____ Group: _____

GATHERING INFORMATION

I do research

Name: _____ Group: _____

GATHERING INFORMATION (*continued*)

I apply my research results

Reflection

	Yes	No
Do I fully understand what I need to do?	☐	☐

Name: _____ Group: _____

COMPLETING THE CASE STUDY

I make suggestions

Reflection

	Yes	No
Have I considered other solutions?	☐	☐

Name: _____ Group: _____

VALIDATING THE CASE STUDY

I justify my approach

Name: _____ Group: _____

MY EVALUATION

Use the evaluation grid on page 10 to do a self-evaluation. Write A, B, C, D or E in the appropriate space.

SSC2 Makes the most of his/her knowledge of science and technology				
Criteria*	**Observable indicators**	**Me**	**Teacher**	**Comments**
1	**Creating the context** Formulation of questions for information gathering and statement of case study goal		☐ With help	
2	**Gathering information** Identification of the effects of the chosen teen's diet, and of the organs, tissues and systems that are affected by it		☐ With help	
3	**Completing the case study** Relevance of the explanation regarding the effects of the proposed eating habits and identification of the organs and tissues affected		☐ With help	
4	**Validating the case study** Justification of the proposals and citation of sources		☐ With help	

*** Evaluation criteria**

1 Formulation of appropriate questions
2 Appropriate use of scientific and technological concepts, laws, models and theories
3 Relevant explanations or solutions
4 Suitable justification of explanations, solutions, decisions or opinions

Name: _____ Group: _____

MY EVALUATION (*continued*)

Use the evaluation grid on page 11 to do a self-evaluation. Write A, B, C, D or E in the appropriate space.

SSC3 Communicates in the languages used in science and technology				
Criteria*	**Observable indicators**	**Me**	**Teacher**	**Comments**
1	**Gathering information** Linking of systems, organs and tissues		☐ With help	
2	**Completing the case study** Explanation regarding the effects of the proposed eating habits		☐ With help	
3	**Completing the case study** Respect for scientific vocabulary when explaining the effects of the proposed eating habits		☐ With help	

*** Evaluation criteria**

1 Accurate interpretation of scientific and technological messages
2 Appropriate production or sharing of scientific and technological messages
3 Use of appropriate scientific and technological terminology, rules and conventions

EVALUATION GRIDS

Name: _____ Group: _____

SSC2 Makes the most of his/her knowledge of science and technology

Criteria*	Observable indicators	A	B	C	D	E
1	**CREATING THE CONTEXT** Formulation of questions for information gathering and statement of case study goal	The goal of the case study is stated very clearly and the questions are relevant.	The goal of the case study is stated clearly and the questions are relevant.	The goal of the case study is more or less stated clearly OR the questions are more or less relevant.	The goal of the case study is more or less stated clearly AND the questions are more or less relevant.	The work needs to be redone.
2	**GATHERING INFORMATION** Identification of the effects of the chosen teen's diet, and of the organs, tissues and systems that are affected by it	The effects of the diet studied are relevant and all are linked to the appropriate systems and organs (or tissues).	The effects of the diet studied are relevant and most are linked to the appropriate systems and organs (or tissues).	Some of the effects of the diet studied are relevant and most are linked to the appropriate systems and organs (or tissues).	Some of the effects of the diet studied are relevant, but they are not linked to the appropriate systems and organs (or tissues).	The work needs to be redone.
3	**COMPLETING THE CASE STUDY** Relevance of the explanation regarding the effects of the proposed eating habits and identification of the organs and tissues affected	The text of the broadcast very clearly describes how the proposed eating habits will limit the effects of junk food on organs and tissues.	The text of the broadcast clearly describes how the proposed eating habits will limit the effects of junk food on organs and tissues.	The text of the broadcast describes how the proposed eating habits will limit the effects of junk food, but does not target the correct organs and tissues.	The text of the broadcast does not describe how the proposed eating habits will limit the effects of junk food and does not target the correct organs and tissues.	The work needs to be redone.
4	**VALIDATING THE CASE STUDY** Justification of the proposals and citation of sources	The justification of the proposals is very clearly stated and relevant AND all the sources are cited correctly.	The justification of the proposal is clearly stated and relevant AND most of the sources are cited correctly.	The justification of the proposals is not clearly stated or relevant OR most of the sources are not cited correctly.	The justification of the proposals is not clearly stated or relevant AND most of the sources are not cited correctly.	The work needs to be redone.

* Evaluation criteria

1 Formulation of appropriate questions
2 Appropriate use of scientific and technological concepts, laws, models and theories
3 Relevant explanations or solutions
4 Suitable justification of explanations, solutions, decisions or opinions

Name: _____

Group: _____

EVALUATION GRIDS (*continued*)

SSC 3 Communicates in the languages used in science and technology

Criteria*	Observable indicators	A	B	C	D	E
1	**GATHERING INFORMATION** Linking of systems, organs and tissues	All of the affected organs and tissues are linked to the appropriate system.	Most of the affected organs and tissues are linked to the appropriate system.	Some of the affected organs and tissues are linked to the appropriate system.	The affected organs and tissues are not linked to the appropriate system.	The work needs to be redone.
2	**COMPLETING THE CASE STUDY** Explanation regarding the effects of the proposed eating habits	The explanations are coherent, well-structured and very clearly describe the effects of the proposed eating habits.	The explanations are coherent, well-structured and clearly describe the effects of the proposed eating habits.	The explanations are more or less coherent and well-structured OR more or less clearly describe the effects of the proposed eating habits.	The explanations are more or less coherent and well-structured AND more or less clearly describe the effects of the proposed eating habits.	The work needs to be redone.
3	**COMPLETING THE CASE STUDY** Respect for scientific vocabulary when explaining the effects of the proposed eating habits	All of the organs and tissues are correctly identified and all of the explanations respect scientific vocabulary.	Most of the organs and tissues are correctly identified and most of the explanations respect scientific vocabulary.	Some of the organs and tissues are correctly identified OR the explanations more or less respect scientific vocabulary.	Some of the organs and tissues are correctly identified AND the explanations more or less respect scientific vocabulary.	The work needs to be redone.

* Evaluation criteria

1 Accurate interpretation of scientific and technological messages
2 Appropriate production or sharing of scientific and technological messages
3 Use of appropriate scientific and technological terminology, rules and conventions

Name: _____ Group: _____

INFORMATION DOCUMENT 1

Are you eating too much salt?

Everyday foods may contain alarmingly high amounts

FRANK LE CLAIR, a 58-year-old provincial government employee living in Winnipeg, had no idea that his blood pressure was too high. While out of town last winter, he came down with a cold and a sore throat and decided to see a local doctor.

After checking his cold symptoms, she measured his blood pressure. “It was higher than 160 over 110,” Le Clair recalls. The doctor advised him to see his regular physician as soon as he got home.

Le Clair’s GP referred him to the Winnipeg Health Sciences Centre, where dietitians told him that he might be able to control his blood pressure by changing his lifestyle rather than by taking drugs. People with high blood pressure, he learned, have to control or eliminate four elements: smoking, drinking, food quantities and salt.

Le Clair doesn’t smoke or drink, but there were some changes he could make in the other two categories. “Salt is my downfall. Even on salad—salt, then salad dressing, then more salt. I ate it unconsciously.”

A typical snack for Le Clair consisted of potato chips or cheesies. Frequently at dinnertime he and his wife would skip cooking and have a sandwich with processed meat. And he liked to eat at fast-food restaurants. He wasn’t aware of just how high his daily salt intake was.

MOST PEOPLE in Canada know that too much salt is bad for them. But, like Frank Le Clair, few realize how easy it is to eat too much. Health Canada says we generally consume more salt than is required.

To moderate our intake, it suggests we eat more fresh fruits and vegetables and choose highly salted snack foods less often. Health Canada also recommends that people check labels when shopping to choose foods that are unsalted or low in salt, and cut down on processed food. About 75 percent of the sodium chloride—common salt—Canadians consume daily comes from processed and packaged foods.

Dietitian Patricia Chuey of Eating for Energy, a nutrition consulting firm in Vancouver, says the recommended allowance is about 2400 milligrams of sodium daily, which works out to about one teaspoon or six grams of salt. “Canadians today eat two to three times what they need,” Chuey says.

However, it can be difficult to determine the quantity of salt in processed foods in Canada. Unlike the United States, we don't have mandatory labelling of the quantities of ingredients in food—even when there is a claim made on the label, such as “low sodium” or “low fat.” Labels do rank the ingredients from highest to lowest percentage, but if a tomato sauce label simply reads “tomatoes, salt,” it is impossible to figure out how much salt was added.

Which everyday foods are high in salt? Foods such as processed meats, butter, margarine and baked beans are generally big salt providers. Canned and packaged soups have very high sodium counts, as well. In fact, some processed foods have a salt concentration equal to or greater than that of seawater.

…

Why is salt bad for you?

The most conclusive evidence so far that a high-salt diet is bad for you is the “Intersalt” study, involving 10 000 people in 32 countries. It measured the relationship between urinary sodium excretion—a direct measure of salt consumption—and blood pressure. The study found that populations with the lowest sodium excretion also have the lowest blood pressures.

…

Although medical experts do not understand why some people are salt sensitive, they do know that in these people high salt intake increases their total body fluid. This forces the heart to pump harder,

Name: _____ Group: _____

INFORMATION DOCUMENT 1 (*continued*)

increasing the pressure on blood vessels, which can contract and expand like rubber tubing.

...

A high-salt intake triggers a vicious cycle. Those who are used to a lot of salt in their food find they need increasing amounts to be able to continue to taste its flavour—the more salt they eat, the more they want. It is also an aggravating factor in osteoporosis and is closely linked to stomach cancer. A high salt intake can be dangerous for people with conditions that are aggravated by fluid retention, such as hepatitis, liver or kidney problems.

If not salt, then . . .

Although most people are aware of the importance of a low-sodium diet for healthy eating, many people find there is not as much information available as there is for low-fat diets. Marianne Long, a 54-year-old construction project planner whose blood pressure was abnormally high, says that at first she had trouble finding recipes. "You have to gather information about the sodium content of foods and be creative," Long says. "When I started restricting salt, everything tasted bland. But eventually I learned to cook with seasonings and herbs."

Most people have the same experience. "Salt is an acquired taste," says dietitian Dayna Weiten of the Winnipeg Health Sciences Centre. "It may take one to three months for the taste buds to adjust to less salt, but after that, people tell me they can't stand canned soup, for example, because it tastes too salty."

A low-salt diet benefits all age groups. Research has shown that a group of babies in the Netherlands on reduced salt intake had lower blood pressure compared to a control group. Their blood pressures remained lower than the control group's even by the age of 15.

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If you want to cut down on salt, experts recommend the following:

- Eat plenty of fresh fruit and vegetables. They are a good source of potassium, which helps lower blood pressure. Steam or microwave vegetables to retain the potassium.
- Do not add salt when cooking. Remember that stock cubes, soya sauce and other flavour enhancers contain large amounts of salt.
- Cut down on your use of luncheon meats and snack foods. Pam Smith, a dietitian at the QE II Health Sciences Centre in Halifax, suggests avoiding anything in a box that is supposed to be "quick to prepare." These usually have salt added as a preservative. Limit or avoid prepared sauces; almost all prepared sauces have high levels of salt.
- If you must have salt at the table, use it sparingly. Always taste your food before adding salt. Don't try replacing table salt with other kinds of salt. It's a myth that rock and sea salt are acceptable substitutes; they have almost as much sodium as table salt.
- Reduce your use of ketchup, barbecue sauce, mayonnaise, pickles, gravies and salad dressing.
- Use lower-salt margarines and spreads.
- Avoid bacon, ham, wieners, corned beef and sauerkraut. All cheese is salty, particularly processed cheddar, parmesan and feta. Mozzarella and Swiss have much lower salt content.
- Choose reduced-salt versions of standard foods, selecting the product with the least sodium. The recommended daily allowance of six grams is equivalent to 2.4 grams or 2400 milligrams of sodium, which is how it is listed on some food labels.
- Instead of salt, use herbs, spices, wine, lemon juice, garlic or mustard when cooking. Use fresh celery, onion and carrot instead of stock cubes—or make your own stock, preferably vegetarian.
- Make gradual changes to allow your taste buds to adjust.

Restaurant and take-out food is generally high in salt. Ask whether it's possible for your meal to be prepared without added salt.

Source: Gail Hulnick. *Are you eating too much salt*? Reader's Digest, 2009 [online article]. Retrieved from http://www.readersdigest.ca/mag/1999/09/living_01.html (accessed October 21, 2009).

Name: _____ Group: _____

INFORMATION DOCUMENT 2

Shaking salt and sugar from your diet

The white stuff lurks in the strangest places.

It's no accident that salt and sugar permeate the nation's food supply. Both are inexpensive palate-pleasers, and food manufacturers use them liberally to satisfy our penchant for things salty and sweet. Today the average American consumes nearly twice the recommended maximum of sodium and nearly 460 nutritionally empty calories of added sugar every day.

Overindulging those particular taste buds can have serious health consequences. A high-sodium diet not only increases the risk of high blood pressure—and subsequent heart attack, kidney disease, and stroke—but possibly also osteoporosis and kidney stones (by increasing the excretion of calcium into the urine), stomach cancer (by damaging the protective mucus membrane), and asthma (by making lungs more susceptible to irritants). And all those sugar calories probably contribute to our expanding waistlines.

Unfortunately, consuming less salt and sugar isn't easy. Three-quarters of the sodium in our diet comes from processed, packaged, and prepared foods; even products that don't taste salty, such as breads and other baked goods, often contain large amounts. And many apparently nutritious foods pack far more of the sweet stuff than you'd expect.

Still, cutting back on both is possible.

Salt: how low can you go?

The National Academies' Institute of Medicine recommends that most adults get no more than 2300 milligrams of sodium a day—the amount, roughly, in one teaspoon of table salt. People with a systolic blood pressure over 120 millimetres of mercury (mm/Hg) or a diastolic pressure over 80 mm/Hg should aim for 1500 mg. So should individuals who have an increased risk of developing high blood pressure or face particular risks from high levels, including anyone over age 60, black people, and those who have diabetes or chronic kidney disease.

...

Sugar blues?

Some of the supposed dietary dangers of sugar have been overblown. Many studies have debunked the idea that it causes hyperactivity, for example. And indulging your sweet tooth won't lead to diabetes; indeed, even people with diabetes can safely eat a sugary snack if it's factored into their meal plan.

Sugar is guilty as charged, however, for nourishing the bacteria that cause dental cavities. And while there's nothing inherently fattening about sugar, it's probably not coincidental that the nation's ongoing obesity epidemic has progressed in step with our increased sugar consumption. Americans today consume 15 percent more added sugars than they did 25 or so years ago. Over that same time, the percentage of overweight or obese adults has grown from 47 to 66 percent.

Foods that contain natural sugars, such as fresh fruit and milk, also provide essential nutrients. But many foods and beverages with high levels of added sugars have little or no nutritional value—and diets high in added sugars tend to be low in important vitamins and minerals.

Subtracting added sugars

...

You can wean yourself from your sugar fix by gradually reducing the amount of sugar you add to coffee, tea, cereal, and other foods. Here are some other ways to cut back:

Choose sweets that contain some needed nutrients. When you crave something sweet, opt for fruit, low-fat chocolate milk, lightly sweetened whole-grain cereal, or plain yogurt flavoured with fresh fruit. Watch out for some fruit-filled yogurts, however; Breyers Smart! Low Fat Yogurt, for example, packs 28 grams of sugar, most of it added.

Swap candy for healthy snacks. Opt for dry-roasted nuts, air-popped popcorn, or baked tortilla chips.

Name: _____ Group: _____

INFORMATION DOCUMENT 2 (*continued*)

Watch what you drink. While soft drinks account for almost half of the added sugars in the American diet, many ready-to-drink teas and juice drinks are also loaded with sugar. For healthier versions, spike water with a few ounces of strongly flavoured tea, a generous squeeze of lemon, or ice cubes made of fruit juice. Or blend your own smoothies from fresh or frozen fruit, nonfat yogurt, and ice.

...

Source: This article first appeared in the January 2008 issue of Consumer Reports on Health. Retrieved from http://www.consumerreports.org/health/healthy-living/diet-nutrition/diets-dieting/shaking-salt-and-sugar-from-your-diet-1-08/overview/salt-and-sugar-ov.html (accessed October 21, 2009).

Name: _____ Group: _____

INFORMATION DOCUMENT 3

Soft drinks and obesity

Popular among youth

Soft drinks are manufactured by multinational corporations with endless financial means to promote their products. For example, the leading manufacturers of soft drinks spent nearly $1 billion in advertising in 2004 alone! And their efforts seem to be working: between 1977 and 1997 in the U.S., the consumption of soft drinks increased 61% among adults and more than 100% among children and adolescents. This age group is particularly fond of these beverages; studies show that 73% of adolescent boys and 62% of adolescent girls drink soft drinks every day!

Beverages that are pro-obesity...

...

The staggering increase in obesity in industrialized countries is linked to major changes in modern diets, particularly the over-consumption of high-calorie products such as junk food and soft drinks.

...

It appears that the heavy consumption of soft drinks among youth could also play a role in youth obesity. For example, an American study conducted by Harvard University among 550 children ages 11-12 showed that the risk of obesity among these children greatly increased with the frequency of soft drink consumption. In another study, a reduction in soft drink consumption among youth aged 13 to 18 years over a period of six months resulted in a significant decrease in body weight among these youth, once again suggesting a direct link between the regular consumption of these beverages and excess body weight.

...

... and pro-diabetes

Another harmful effect linked to the large amounts of sugar in soft drinks is the risk of developing type 2 diabetes. In fact, excess sugar consumption gradually causes the body's organs to become insulin-resistant; that is, incapable of correctly using the sugar present in the blood. This causes the pancreas to secrete even more insulin (albeit in vain), which over the long-term leads to pancreatic malfunction and the development of diabetes.

For example, in the above-mentioned study, women who drank just one can of soft drinks a day increased their risk of developing diabetes by almost 100%.

It's clear that soft drinks are far from being harmless to one's health. On the contrary, they need to be consumed with moderation. One also needs to be wary of the many "punch" and "cocktail" type beverages that often contain only a trace of real fruit: these beverages contain almost as much sugar as soft drinks and may also have the same harmful effects on body weight.

Instead of regularly drinking these beverages, we need to remember that there's a very simple, affordable and healthy way to quench one's thirst: drink water!

Source: Richard Béliveau (doctor of biochemistry). *Les boissons gazeuses et l'obésité*, Medisource [online article], 2007 (accessed November 2, 2007). [*Translation*]

Name: _____ Group: _____

INFORMATION DOCUMENT 4

Sugar

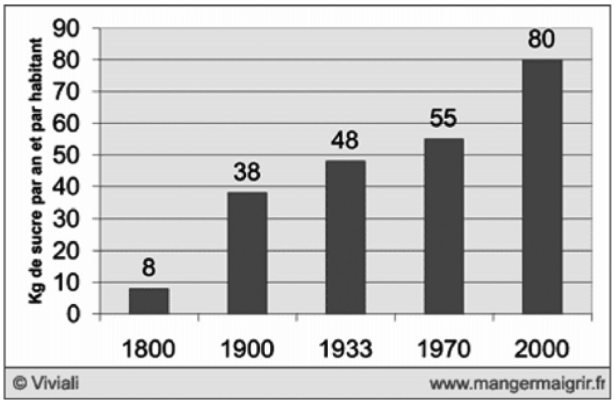
Overview

Sugar, present in the form of glucose in the blood, is indispensable for the survival of our cells, particularly those in the brain (neurons). But be warned: glucose may be somewhat of a "noble fuel" for our body, but it can also be the best and the worst of food and must be consumed with the utmost caution.

For the brain, glucose is indispensable. When glucose levels drop too low in the blood, brain cells stop functioning normally. If glucose levels in the blood do not return to normal, this situation can eventually lead to coma and, ultimately, death.

But these days, sugar is rampant in food, and our modern problem is rather one of excessive sugar in the blood, rather than its deficiency. In fact, we consume on average 10 to 20 times more sugar than our bodies need, and this is leading to certain health problems.

Increase in sugar consumption in kilograms per person per year between the years 1800 and 2000 in the U.S.:



People everywhere in the world, even the most impoverished, have a clear tendency to increase their consumption of sugar.

This increase can be explained in part by the pleasant taste of sweet food, and the desire to sweeten food.

So, for our body—and more particularly our brain—to function properly, sugar levels in the blood must be around 1 gram per litre of blood (+/- 1.2 g/litre). Hypoglycemia is defined by a glucose level below 0.8 g/L and hyperglycemia corresponds to a glucose level above 1.2 g/L.

When hyperglycemia occurs, the body's coping mechanism kicks in: the pancreas produces insulin to lower blood sugar levels, causing this excess sugar to be stored in the liver and muscles in the form of glycogen, while the surplus is converted into fat.

This stored sugar can be released should hypoglycemia occur, such as when there is a lack in reserves of slow sugars that constantly supply the body. These major hypoglycemic episodes create a strong craving for "fast" sugars, which have a harmful effect on the body.

It is therefore important to overcome a sweet tooth, a real form of addiction by making food "more tasty". It is crucial to eliminate refined carbohydrates such as powdered sugar, white bread and white rice. Instead, opt for more complex carbohydrates like whole grain rice, oats, rye, high-fibre food, whole grain cereals, vegetables…

Source: Pierre Laurent (cardiologist), editor. *Le sucre* [online article], 2006. Retrieved from http://www.mangermaigrir.fr/alimentation/sucre.php (accessed November 2, 2007). [*Translation*]

Name: _____ Group: _____

INFORMATION DOCUMENT 5

Trans fat

The issue

Scientific evidence has shown that dietary trans fats can increase your risk of developing heart disease. You can reduce this risk by choosing healthier foods that contain little or no trans fat.

Background

Fat is an important part of a healthy diet because it provides essential fatty acids and energy (calories). It also helps your body absorb Vitamins A, D and E.

Fats and oils are made mostly of fatty acids. There are four main types of fatty acids. Most fats and oils contain a mixture of all four types, but such mixtures usually have a higher proportion of one particular type of fatty acid.

The four main types of fatty acids are:

Polyunsaturated fatty acids - Many common vegetable oils (e.g. soybean, corn and sunflower oil), fatty fish (e.g. salmon, mackerel, smelt, herring and trout), fish oils, flaxseed, sunflower seeds, soybeans and some nuts (e.g. walnuts) contain a high proportion of polyunsaturated fatty acids.

Monounsaturated fatty acids - Olive oil, canola oil, high oleic sunflower oil, avocados and certain nuts (e.g. cashews, pecans, almonds and peanuts) contain a high proportion of monounsaturated fatty acids.

Saturated fatty acids - Coconut, palm and palm kernel oils, animal fats (e.g. pork and beef), butter, cheese and other dairy products contain a high proportion of saturated fatty acids.

Trans fatty acids - These are found naturally in small amounts in certain foods (e.g. dairy products, beef and lamb). Also, small amounts of trans fats are formed during the refining of liquid vegetable oils (e.g. canola and soybean oil). Trans fats are also created when manufacturers use a process called "partial hydrogenation." This process turns liquid oil into a semisolid form, such as shortening or margarine.

Food products made with fats or oils with a high proportion of saturated or trans fatty acids have a longer shelf life than products made with oils that contain a higher proportion of other fatty acids. Saturated and trans fatty acids also play a role in producing the textures and flavours that make many bakery products and snacks so tempting. For example, it is the saturated and trans fatty acids that give pastries that "melt in your mouth" feeling.

The health effects of dietary facts

In general terms, polyunsaturated and mono-unsaturated fatty acids tend to lower your risk of heart disease. They are the healthier fats, and they should be included in your diet. Saturated and trans fatty acids are unhealthy fats because they tend to raise your risk of heart disease.

Trans fats do two things that raise the risk of developing heart disease:

- Trans fats raise blood levels of so-called bad cholesterol (LDL-cholesterol). LDL-cholesterol is a risk factor for heart disease.
- Trans fats lower blood levels of so-called good cholesterol (HDL-cholesterol). HDL-cholesterol protects against heart disease.

Saturated fats also raise blood levels of "bad" cholesterol. However, at the same time, they also raise blood levels of "good" cholesterol.

Minimizing your risk

The best way to minimize the risk of adverse health effects related to trans fat is to reduce your intake of foods that contain trans fatty acids.

- Follow the suggestions in *Canada's Food Guide to Healthy Eating*. The *Guide* advises you to choose lower fat dairy products, leaner meats and foods prepared with little or no fat.
- Read the labels on prepackaged food products. Since December 2005, it has been mandatory for most foods to list on the "Nutrition Facts" table the amount of trans fat in the product. Also, look for the phrase "partially hydrogenated oil." If you see this phrase in the list of ingredients on the label, it means the product contains trans fat.

Name: _____ Group: _____

INFORMATION DOCUMENT 5 (*continued*)

- Choose soft margarines that are labelled as being free of trans fat or made with non-hydrogenated fat.
- Fry foods less often. When you do fry foods, use healthier oils that contain a higher proportion of monounsaturated fats. Do not re-use the oils more than two or three times.
- When you eat out, ask about the trans fat content of foods on the menu.

Remember, saturated fat also increases your risk of developing heart disease. You can lower your intake of both saturated and trans fats by eating more vegetables and fruit, fish, shellfish and other seafood, whole grain breads and cereals, peas, beans, lentils and nuts. It also helps to choose oils and fats that contain a high proportion of polyunsaturated and monounsaturated fatty acids.

…

Source: Health Canada. *Trans Fat* [online edition], 2008. Retrieved from http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/food-aliment/trans-eng.php (accessed August 26, 2009).

INFORMATION DOCUMENT 6

Memo on food-related diseases

Cholesterol

Cholesterol is an essential fat-like substance; it contributes to the manufacture of cells and hormones ... but its accumulation in the blood and lining of the arteries can be dangerous. Most of the cholesterol found in the body is produced by the liver, but we can also obtain it through food such as eggs, organ meats, butter and whole milk. ... High cholesterol can also be genetic in nature.

Increased levels of cholesterol in the blood cause coronary disease. It accumulates in the lining of the arteries, reduces their lumen, hinders blood flow and promotes the development of blood clots. ...

Source: Ministère de la Recherche et du Conseil régional d'Aquitaine. *Mémo sur les maladies liées à l'alimentation* [online document], 2005 (accessed November 3, 2007). [*Translation*]

Name: _____ Group: _____

INFORMATION DOCUMENT 7

What's wrong with trans fat?

Like all saturated fats, trans fats increase LDL ("bad cholesterol") levels in the blood, while reducing HDL ("good cholesterol") levels. This significantly increases the risk of developing cardiovascular disease. According to the results of a study published in 1997, trans fats could increase this risk by 132%, compared to 32% for saturated fats.

Before, when people only consumed **natural trans fats**, which are found only in small quantities in nature, the health risks were practically nonexistent. But the omnipresence of synthetic trans fats in processed foods is a real source of concern for health authorities. It is believed that over a certain threshold (10 g of trans fat per 100 g of total fat, or 10%), trans fat could increase the risk of developing cardiovascular disease.

And yet, researchers say that in post-industrialized nations, this critical threshold is largely surpassed, and has been for the last few decades. For example, it is estimated that in the United States, daily consumption of trans fat can in some cases reach 38.7 g. According to these same researchers, 90% to 95% of these trans fats come from hydrogenated oils. ...

Source: PasseportSanté, Fondation Lucie et André Chagnon (Canadian philanthropic society involved in health promotion and illness prevention). *Que reproche-t-on aux gras trans* ? [online document], 2005. Retrieved from http://www.passeportsante.net/fr/Actualites/Dossiers/ArticleComplementaire.aspx?doc=que_sont_les_gras_trans_do#P30_4677 (accessed November 3, 2007). [*Translation*]

INFORMATION DOCUMENT 8

Fighting the war against junk food

Greasy, fried food saturated with salt and sugar, portions that just keep getting bigger…
How to win the war against junk food without denying one's pleasure?

Trans fats: The new bad guys

Since the early 1990s, numerous studies have proven the harmfulness of trans fats, abundant in prepared food like cake mixes, cookies and batter... Their shortenings and other solid vegetable fat help preserve foods and reduce the price of the products. What's more, trans fats long had the upper hand because they replaced animal-based saturated fats (butter and suet), loathed by dietitians.

Meanwhile, scientists have gradually realized that trans fats significantly increase the rate of bad cholesterol while decreasing good cholesterol, reduce the ability of blood vessels to dilate or contract and jeopardize, to a certain extent, the protection of cell membranes. ...

Source: Pascale Guericolas. *Dur combat* contre *la malbouffe,* Contact magazine, Université Laval [online edition], 2005. Retrieved from http://www.contact.ulaval.ca/articles/dur-combat-contre-malbouffe-62.html (accessed November 3, 2007). [*Translation*]