



### CONSUMPTION GUIDE

MAXIMUM NUMBER OF MEALS PER MONTH (12 meals per month or more)	MERCURY CONTENT (mg of Hg/kg of flesh)
Unrestricted consumption	0.00 to 0.29
8 meals per month	0.30 to 0.49
4 meals per month	0.50 to 0.99
2 meals per month	1.00 to 1.99
1 meal per month	2.00 to 3.75

A meal is considered equivalent to 230 g (8 oz) of fish flesh, before cooking.

SPECIES	CONSUMPTION LENGTH (mm)
LE	400
WB	500
LW	500*
CI	300
BT	300
ST	900
NP	700
WA	500*
SA	350
LT	600
GO	350
MO	350
FO	250

\* When Lake Whitefish or Walleye are caught in brackish or salt water, the consumption length considered is 400 mm.

The information given on the map comes from the water bodies for which Hydro-Québec has mercury concentration measurements in the flesh of the species illustrated. The values are based on data collected between 1976 and 1991.

Since the mercury levels in a given species vary greatly between lakes, the number of meals suggested per month for a given lake cannot be applied to another lake.

The number of meals recommended per month is based on:  
 - the mean mercury concentrations measured in each water body for the consumption lengths indicated;  
 - the Guide de consommation du poisson de pêche sportive en eau douce du gouvernement du Québec (<http://www.mmq.gouv.qc.ca/eau/guide/index.htm>).

Since the mercury levels increase with fish length, the number of meals per month should be cut by half if the catches clearly exceed the consumption length indicated. The reverse is also true if the catches are clearly smaller than the consumption length given on the map.

As long as the number of recommended meals per month is not exceeded, they can be taken over a short period of time, for example during a single fishing trip.

The non-piscivorous species preferred by anglers is the Brook Trout. If there is no indication given for a specific water body, the number of meals recommended per month is generally the same as for Lake Whitefish.

### FISH IS GOOD FOR YOUR HEALTH

Fish is a very healthy food source. It has been shown that a regular consumption of fish decreases the risk of heart disease. This decrease is attributed to the presence of high quality omega-3 fatty acids. These fatty substances, which are not found in other animal flesh, also benefit the development of the fetus and children, and help prevent certain types of cancer and inflammatory diseases. Therefore, it is highly recommended to include fish regularly in your diet.

**FISH IS AN EXCELLENT SOURCE OF:**

**Proteins:** The building block of the human body, proteins are essential for building and repairing all the body structures (muscles, hormones, genes). They also contribute to the regulation of certain metabolic mechanisms.

**Vitamin D:** Vitamin D is essential for maintaining calcium and phosphorus in the blood serum at levels adequate for bone growth, tooth growth, and neuromuscular functions.

**Selenium:** Selenium is a mineral essential to the functions of an antioxidant enzyme called glutathione-peroxidase.

**Lipids:** A concentrated source of energy, lipids are essential for the transport and absorption of liposoluble vitamins (A, D, E, K) and provide precious essential fatty acids (EFA). EPA and DHA, both omega-3 fatty acids, are components of lipids which can protect against heart diseases, inflammatory diseases, and nervous system problems.

### FATTY ACIDS IN THE FISHES OF THE LA GRANDE COMPLEX AREA

Species	Fatty acids (EPA + DHA) mean (mg/meal)
Lake Whitefish	430
Cisco	400
Round Whitefish	400
Northern Pike	290
Walleye	530
Brook Trout	1160
Lake Trout	730
Landlocked Atlantic Salmon (Quarantined)	900
Burbot	240

### PRECAUTION FOR PREGNANT WOMEN

Pregnant women or women planning a pregnancy, and women who are breast feeding, should be cautious. However, to enjoy the advantages of consuming fish and to avoid any risk related to mercury, it is recommended that these women should consume marine species or choose the less contaminated freshwater species, presented in green, up to a maximum of 5 meals per month.

### INFRASTRUCTURE AND SERVICES

- Paved main road
- Paved secondary road
- Gravel secondary road
- Tertiary road
- Dyke or dam
- Power transmission line (735 kV)
- Airport
- Service station
- Access ramp
- Outfitter
- Workers' camp

### LAND COVERED BY THE JAMES BAY AND NORTHERN QUEBEC AGREEMENT

- Limits of the James Bay territory
- Category I lands — Crees
- Category II lands — Crees

In category I and II lands, native people have exclusive hunting, fishing and trapping rights. Outside the category I and II lands, the following fish species are for the exclusive use of the native people: Lake Whitefish (non-migrating), Lake Sturgeon, Longnose Sucker, White Sucker, Burbot, Mooneye and Goldeye.

For additional copies of this map, please contact:  
 Hydro-Québec  
 Bureau d'accueil  
 25, boulevard Lévesque ouest, rez-de-chaussée  
 Montréal (Québec)  
 H2Z 1A4

Source: Hydro-Québec  
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**FISH ON THE MENU? RECIPES ON THE BACK**

### Fish consumption guide for the water bodies of the Nottaway, Broadback and Rupert region

Centre de Recherche  
 Hydro Québec  
 Unité de recherche en santé publique

2001

# FISH IS A HEALTHY...AND TASTY FOOD!



## Mercury in fish

### Sources of mercury

Mercury can occur naturally, as when produced by volcanoes and forest fires, or be produced by human activities such as coal burning and garbage incineration. It reaches the La Grande complex through long range atmospheric transport. At that stage, it is in an inorganic form, which is relatively harmless since it is barely assimilated by living organisms.

### The transformation of mercury

In lakes and rivers, this inorganic mercury is transformed by bacteria into methylmercury, an organic form which is easily assimilated by living organisms and can become toxic at high concentrations. Methylmercury concentrations increase when moving up the food chain from plankton (small plants and animals living in suspension in the water column) to aquatic insects and fishes. Fishes that feed on other fish, such as Northern Pike, are more contaminated by mercury than species that feed on insects, such as Brook Trout. Mercury accumulates throughout the life of fishes, so that the older and larger fish contain more mercury.

### Mercury and reservoirs

The green portion of plants and forests flooded by the filling of reservoirs provides food to the bacteria which transform inorganic mercury into methylmercury. More mercury is therefore assimilated by fishes. However, this increase is only temporary since the green portion of plants decays rapidly, so that after 5 or 6 years, methylmercury production in reservoirs is no greater than in natural lakes.

### Time does the magic

The monitoring of mercury levels in the fishes of the La Grande reservoirs showed that the concentrations in fishes feeding on insects, such as Lake Whitefish, return to levels comparable to those in natural lakes after 10 to 20 years. In fishes that feed on other fishes, such as Walleye, the return to natural levels is longer and may take up to 20 to 30 years.

### Decreasing mercury!

In all the La Grande reservoirs, with the exception of the Laforge 1 reservoir which was flooded more recently, the mercury levels in fishes feeding on insects are now comparable to those in natural lakes. In the case of fishes feeding on other fishes, the mercury levels have been gradually decreasing for several years, everywhere except in the Laforge 1 reservoir.

### Fish on the menu

This guide for fish consumption is based mostly on mercury levels measured in 1999 and 2000. Since these levels are still decreasing in species feeding on fish, the number of meals per month of these species can be gradually increased. An update of this guide is planned for the year 2005.

## FIESTA CHOWDER

### Ingredients

500 g (1 lb)	white fish fillets
125 mL (1/2 cup)	chopped onion
125 mL (1/2 cup)	chopped green pepper
1	crushed garlic clove
30 mL (2 tablespoons)	olive or vegetable oil
540 mL (19 oz)	can of tomatoes
213 mL (7.5 oz)	can of tomato sauce
250 mL (1 cup)	diced potatoes
1	small bay leaf
1 mL (1/4 teaspoon)	oregano
	salt and pepper

### Preparation

Cut the fish in 2 cm (1 in) pieces. Soften onion, green pepper and garlic in the oil. Add the rest of the ingredients, except the fish. Simmer slowly for 15 minutes. Add the fish and simmer for 5 to 7 minutes or until the flesh is opaque and separates easily.

Makes 4 servings.

Translated from *Seafood and fish at all seasons, Fisheries and Oceans Canada.*



## TINFOIL COOKED WALLEYE

### Ingredients

500 g (1 lb)	walleye fillet
125 mL (1/2 cup)	vegetable broth
125 mL (1/2 cup)	julienne carrots
1/2	sliced onion
1	diced tomato
5 mL (1 teaspoon)	chopped tarragon
	salt and pepper

### Preparation

Preheat oven to 175°C (350°F).

Place the walleye fillet at the centre of a large sheet of tinfoil; fold the edges to form a wrapper. Pour the broth on the fish. Cover with carrots, onion and crushed tomato; sprinkle with tarragon; add salt and pepper. Close the wrapper.

Cook for 15 minutes.

Remove from oven. Open the wrapper. Let rest for 4 minutes.

Serve with boiled vegetables, if desired.

Makes 4 servings.

Translated from *Cuisine santé: Quand est-ce qu'on mange? 4, Les Cercles de fermières du Québec, 1997.*

## STUFFED WALLEYE

### Ingredients

1.4 kg (3 lb)	walleye
250 mL (1 cup)	fresh bread crumbs
125 mL (1/2 cup)	cooked rice
30 mL (2 tablespoons)	vegetable or olive oil
125 mL (1/2 cup)	chopped mushrooms
15 mL (1 tablespoon)	chopped onion
15 mL (1 tablespoon)	chopped parsley
2 mL (1/2 teaspoon)	curry powder
1	beaten egg
	salt and pepper

### Preparation

Soak bread crumbs in hot milk for 30 minutes. In a frying pan, cook onion in oil. Add mushrooms and cook for 5 minutes. Add drained bread crumbs, cooked rice, parsley, curry powder, salt and pepper.

Remove from heat and thicken with a beaten egg.

### Fish

Scale, empty and clean the fish. Pat dry and sprinkle with salt, pepper, lemon juice and drops of oil.

Fill the fish cavity with the stuffing. Sew the cavity. Place the fish on an oiled baking dish. Add 500 mL of liquid. Cover the dish and bake at 200 °C (95 °F), for 40 minutes.

Makes 6 servings.



## BROOK TROUT WITH DILL

### Ingredients

4	140 g (5 oz) trout fillets
1 mL (1/4 teaspoon)	onion powder
0.5 mL (1/8 teaspoon)	garlic powder
	salt and pepper
60 mL (4 tablespoons)	dill leaves
60 mL (4 tablespoons)	lemon juice
4	curry powder

### Preparation

Prepare a steamer. Sprinkle onion powder, garlic powder, salt and pepper over trout fillets.

Cover fillets with dill leaves. Place fillets in the steamer. Cook for 3 minutes.

Sprinkle with lemon juice, serve the fillets with lemon slices.

Makes 4 servings.

Translated from *Cuisine santé : Quand est-ce qu'on mange? 4, Les Cercles de fermières du Québec, 1997.*

## ORIENTAL TROUT IN TINFOIL

### Ingredients

4	shallots, thinly sliced at an angle
1	large seeded red pepper, cut in thin strips
30 mL (2 tablespoons)	soy sauce
30 mL (2 tablespoons)	red wine vinegar
10 mL (2 teaspoons)	sesame oil
10 mL (2 teaspoons)	ground fresh ginger, or ginger powder
2 mL (1/2 teaspoon)	sugar
15 mL (1 tablespoon)	12.5g (4oz) trout fillets
4	sesame seeds
20 mL (4 teaspoons)	

### Preparation

In a bowl, mix shallots, red pepper, soy sauce, red wine vinegar, oil, ginger and sugar.

Cut four rectangles of tinfoil, 35cm x 30m (14in x 12in). Place one trout fillet on half of each rectangle of tinfoil. Distribute the shallot mixture equally on each fillet and sprinkle with 5mL (1teaspoon) of sesame seeds. Fold tinfoil over fish and close tightly by folding edges twice. Place tinfoil folders on a baking plate.

Cook in preheated oven at 220°C (425°F) from 10 to 12minutes or until the tinfoil folders have inflated and fish flesh is easily separated with a fork. Serve immediately.

Makes 4 servings.

Translated from *Coup de pouce magazine.*

## TINFOIL COOKED FISH WITH SEMOLINA

### Ingredients

500 g (1 lb)	fish fillet (char, trout, ouananiche, etc.)
125 mL (1/2 cup)	couscous
125 mL (1/2 cup)	grated carrot
2 mL (1/2 teaspoon)	lemon zest
1 mL (1/4 teaspoon)	curry powder
125 mL (1/2 cup)	chicken broth
0.5 mL (1/8 teaspoon)	white pepper
1	thinly sliced lemon
125 mL (1/2 cup)	grated zucchini
60 mL (1/4 cup)	finely chopped onion or zucchini
2 mL (1/2 teaspoon)	salt
1 ml (1/4 teaspoon)	oregano
	bay leaf

### Preparation

Preheat oven to 190°C (375 °F). Prepare tinfoil sheet to make a large wrapper.

### Semolina:

In a medium size bowl, mix the couscous, zucchini, carrot, onion and lemon zest, 1 mL of salt, oregano, curry powder and chicken broth. Mix well.

Pour the couscous mixture onto the tinfoil and top with the fish fillet. Add remaining salt, pepper, a bay leaf and lemon slices.

Wrap the tinfoil around the mixture. Place on a baking pan. Cook in the oven for 20 to 25 minutes or on a barbecue. Cook a little longer if the fillet is very thick. Serve.

Makes 4 servings.



## NORTHERN PIKE IN PHYLLO PASTRY

### Ingredients

5 mL (1 teaspoon)	olive oil
350 g (3/4 lb)	diced pike
125 mL (1/2 cup)	chopped leek
80 mL (1/3 cup)	vegetable broth
60 mL (1/4 cup)	instant rice
	salt and pepper
	water
	phyllo pastry sheets

### Preparation

Heat 2 mL of olive oil in a non-stick frying pan on medium heat. Fry the diced fish for 2 minutes, stirring occasionally. Add the chopped leek and stir. Cook for 1 minute. Add vegetable broth and rice; sprinkle with salt and pepper. Bring to a boil. At low heat, simmer for 5 minutes. Remove from heat and let cool down.

Preheat the oven to 175 °C (350 °F).

In a bowl, mix the remaining oil and the water. Spread the phyllo pastry sheets on a working surface. Brush with the oil mixture.

Pile the three sheets on top of one another. Cut four 18 cm (7 in) diameter circles in the pastry. Place the phyllo pastry in four large muffin pans.

Divide the fish preparation into the pans. Wrap the phyllo pastry around the mixture.

Bake for 10minutes. If the top of the pastry colours too quickly, cover with tin foil.

Serve with fresh vegetables of your choice.

Makes 4 servings.

Translated from *Cuisine santé: Quand est-ce qu'on mange? 4, Les Cercles de fermières du Québec, 1997.*



## FISH FILLETS, MEDITERRANEAN STYLE

### Ingredients

1	can tomatoes, not drained, coarsely chopped (540 mL - 19oz)
1	can chickpeas, drained and rinsed (540mL - 19oz)
15 mL (1 tablespoon)	olive oil
1	small green pepper, seeded and finely chopped

1	clove of garlic, minced
2 mL (1/2 teaspoon)	cinnamon
2 mL (1/2 teaspoon)	paprika
2 mL (1/2 teaspoon)	curcuma
1 mL (1/4 teaspoon)	cumin
1 mL (1/4 teaspoon)	salt
1 mL (1/4 teaspoon)	pepper
1	pinch pepper flakes
2	5 cm (2 in) long strips of orange zest
500 g (1 lb)	fresh or frozen fish fillets

### Preparation

In a 28cm x 18cm (11 in x 7in) baking dish, mix tomatoes and chickpeas. Reserve. In a small frying pan, heat half of olive oil at medium-high heat. Add green pepper and garlic, and cook, stirring occasionally, for 3 minutes or until pepper has softened.

Add cinnamon, paprika, curcuma, cumin, salt, pepper and pepper flakes, and mix. Cook for 1 minute, stirring. Add green pepper mixture and orange zest to reserved tomato mixture and mix.

Dry fish fillets with paper towel. Place fish fillets side by side on the tomato mixture, folding the fillet edges underneath. Sprinkle with remaining oil, salt and pepper.

Bake in preheated oven at 220°C (425°F) for 20minutes or until tomato mixture is boiling and fish flesh is opaque and is easily separated with a fork. Serve immediately.

Makes 4 servings.

Translated from *Coup de pouce magazine.*



## WRAPPED BURBOT

### Ingredients

60 mL (1/4 cup)	plain low-fat yogurt
1	crushed tomato
	salt and pepper
8	small Chinese lettuce leaves
8	60 g (2 oz) burbot medaillons
60 mL (1/4 cup)	lemon juice

### Preparation

Prepare a steamer. In a bowl, mix the yogurt and crushed tomato; sprinkle with salt and pepper.

Spread the Chinese lettuce on a working surface. Place one burbot medaillon at the center of each leaf; spread 15 mL (1 tsp) of the yogurt mixture on each medaillon. Wrap the lettuce around the burbot.

Place in the steamer. Cook for 5minutes.

Remove from steamer. Sprinkle with the lemon juice. Serve.

Makes 4 servings.

Translated from *Cuisine santé: Quand est-ce qu'on mange? 4, Les Cercles de fermières du Québec, 1997.*



## OUANANICHE OR BROOK TROUT POACHED IN COURT-BOUILLON

### Ingredients

1	bay leaf
6	fresh parsley sprigs, if available
6	fresh dill leaves, if available
6	fresh thyme leaves, if available
30 mL (2 tablespoons)	chives
2	carrots
250 mL (1 cup)	sliced leek whites
250 mL (1 cup)	dry white wine
1	water
1	small salmon 1.8 kg (4 lb)
1	salt and pepper
1	lemon (juice only)
1	sliced lemon
	fresh dill to garnish

### Preparation

Place herbs, vegetables, wine and water in a cooking pot. Add salt and pepper to taste and cook on low heat for 15 minutes.

Pour the mixture in a baking dish and put in the fish. Sprinkle with lemon juice. Bake in oven at 190 °C (375 °F) for 20 to 25 minutes.

Serve the salmon with lemon slices and steamed potatoes. Garnish with fresh dill.

Makes 6 to 8 servings.

## GRAPEFRUIT OUANANICHE ESCALOPES

### Ingredients

4	140 g (5 oz) ouananiche escalopes
1	thinly sliced cucumber
125 mL (1/2 cup)	plain low-fat yogurt
1	chopped garlic clove
0.5 mL (1/8 teaspoon)	Worcestershire sauce
60 mL (1/4 cup)	grapefruit juice
1	grapefruit, in sections
	salt and pepper

### Preparation

Prepare a steamer.

Sprinkle the salmon with salt and pepper.

Cut the cucumber slices in half. Cover the salmon with half slices of cucumber in a fish scale pattern.

Place the escalopes in the steamer. Cook for 4 minutes.

Meanwhile, in a food processor, mash the remaining cucumber slices with the yogurt, garlic and Worcestershire sauce. Add salt and pepper.

Remove the escalopes from the pot. Sprinkle with the grapefruit juice. Serve the escalopes with the grapefruit sections.

Makes 4 servings.

Translated from *Cuisine santé: Quand est-ce qu'on mange? 4, Les Cercles de fermières du Québec, 1997.*

## CAJUN FISH FILLETS, REMOULADE SAUCE

### Ingredients

155 mL (1/2 cup + 2 tablespoons)	light mayonnaise
60 mL (1/4 cup)	sweet relish
30 mL (2 tablespoons)	chopped fresh tarragon, or tarragon powder
10 mL (2 teaspoons)	

15 mL (1 tablespoon)	chopped fresh parsley
15 mL (1 tablespoon)	chopped capers
15 mL (1 tablespoon)	Dijon mustard
15 mL (1 tablespoon)	freshly pressed lemon juice
2.5 mL (1/8 teaspoon + 1/2 teaspoon)	Cayenne pepper
180 mL (3/4 cup)	corn flake crumbs
15 mL (1 tablespoon)	chilli powder
5 mL (1 teaspoon)	ground cumin
2 mL (1/2 teaspoon)	onion powder
4	250 g (8 oz) fish fillets
	fresh parsley sprigs
	lemon quarters

### Preparation

In a bowl, mix 125 mL (1/2 cup) of mayonnaise, relish, tarragon, parsley, capers, Dijon mustard, lemon juice and 0.5 mL (1/8 teaspoon) of Cayenne pepper. Cover the remoulade and refrigerate until ready to use.

On a large sheet of waxed paper, mix corn flakes, chilli powder, cumin, onion powder and remaining Cayenne pepper. Spread remaining mayonnaise on both sides of the fish fillets, place in the corn flake preparation and coat well on both sides. Spray both sides of the coated fish fillets with Pam.

### Preparation

In a bowl, mix 125 mL (1/2 cup) of mayonnaise, relish, tarragon, parsley, capers, Dijon mustard, lemon juice and 0.5 mL (1/8 teaspoon) of Cayenne pepper. Cover the remoulade and refrigerate until ready to use.

Cut two large potatoes in small cubes.

In a large pot, sauté the onion in the olive oil and add the fish. Cook slightly without colouring the flesh.

Add the potato cubes; stir for a few minutes.

Add water, salt and pepper. Bring to a boil, cover and simmer for 40 minutes.

Vigorously whip the soup to slightly crush the potato cubes. The starch released will thicken the soup. Be sure not to reduce into a purée. Cover and boil for 5 minutes.

Remove from heat. Add one cup of milk.

Makes 4 to 6 servings.

## GRILLED FISH FILLETS WITH MUSTARD, TOMATO RELISH

### Ingredients

4	diced Italian tomatoes, seeds removed
8	pitted black olives, chopped
	shallot, chopped
1	chopped fresh dill, or dry dill
30 mL (2 tablespoons)	dry dill
7 mL (1 1/2 teaspoon)	salt
1 mL (1/4 teaspoon)	pepper
0.5 mL (1/8 teaspoon)	olive oil
30 mL (2 tablespoons)	red wine vinegar
5 mL (1 teaspoon)	Dijon mustard
30 mL (2 tablespoons)	fresh fish fillets
625g (1 1/2lb)	