

**First Nations Food, Nutrition and  
Environment Study (FNFNES):**

**Results from  
Eel Ground First Nation, New Brunswick**

**Atlantic AFN Regions (New Brunswick/Prince Edward  
Island and Nova Scotia/Newfoundland)**



**University of Ottawa  
Université de Montréal  
Assembly of First Nations**

**Final report  
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**“Healthy Environment and  
Healthy Foods for  
Healthy First Nations”**

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## GLOSSARY

The following abbreviations and terms are used in this report:

### Abbreviations:

- FNFNES= First Nations, Food Nutrition and Environment Study
- HH= household
- n= number of participants or number of food, water, or hair samples analyzed
- min= minimum or lowest value
- max= maximum or highest value

### Definitions of terms:

- **Aesthetic objective:** The level of substances in drinking water or characteristics of drinking water (such as taste, odour, or colour) that can affect its acceptance by consumers. Aesthetic objective levels are below levels considered to be harmful to health.
- **Acceptable Macronutrient Distribution Ranges (AMDR):** Expressed as a percentage of energy intake (total calories), the AMDRs are the range of intake for protein (10-35%), fat (20-35%), and carbohydrates (45-65%), associated with a reduced risk of chronic disease and provide adequate amounts of these nutrients.
- **Adequate Intake (AI):** An AI is derived for a nutrient if there is inadequate evidence to establish an Estimated Average Requirement (EAR).
- **Arithmetic mean:** See mean.
- **Average:** See mean.

- **Background level:** The level of a chemical (or other substances) that is normally found in the environment.
- **Body Mass Index (BMI):** Calculated by dividing the weight (in kilograms) by the square of the height (in metres), this index is used to define a healthy or normal weight (range of 18.5-24.9), overweight (25-29.9) and obesity (30 and over). Overweight and obesity are degrees of excess body weight, carrying increased risks of developing health problems such as diabetes and heart disease.
- **Dietary Reference Intakes (DRI):** A set of nutrient-based reference values that are used to assess and plan the diets of healthy individuals and groups. The DRIs include the Estimated Average Requirements (EARs), the Recommended Dietary Allowance (RDA), the Adequate Intake (AI) and the Tolerable Upper Intake Level (UL).
- **Ecozone:** An area defined by the distribution patterns of plants, animals, geographical characteristics and climate.
- **Food Security:** Physical and economic access by all people at all times to sufficient, safe and nutritious food for an active, healthy life. Household food security is estimated through a questionnaire.
- **Guideline value:** In Canada, guideline values are set for the protection of environmental and human health as well as for the protection of aquatic life. For example, there are guidelines for chemicals in human tissues (such as blood and hair), animal tissues (fish, mammals and birds), drinking water, recreational water, and soil. These values are based on the most current scientific data available for the parameter of interest.
- **Groundwater:** Water located beneath the ground surface such as in porous soil spaces and fractures of rock formations. A unit of rock or an

unconsolidated deposit is called an aquifer when it can yield a usable quantity of water.

- **Groundwater under the direct influence of surface water (GUDI):** Groundwater that shows surface water characteristics. This can include water from a well that is not a drilled well or does not have a watertight casing and is up to 6 m in depth below ground level.
- **Hazard Quotient (HQ):** A ratio (contaminant intake/PTDI) used to estimate if an adverse health risk is likely due to a contaminant in question. If the HQ is  $\leq 1$ , the risk of an adverse health effect is not likely. If HQ is  $>1$ , there can be an increased health risk exposure from the contaminant.
- **Individual Water System (IWS):** A system serving individual homes that each have their own pressurized water supply (e.g. a well), or is connected to a piped distribution system that has less than five housing units and does not include any public access buildings.
- **Maximum Acceptable Concentration (MAC):** The concentration or level of a particular substance at which exposure may cause harmful effects on health.
- **Mean (arithmetic):** A statistical value obtained by adding all the values in a data set and dividing by the number of observations; another word for “average”.
- **Mean, geometric (GM):** To calculate a geometric mean, all observations [i.e. values] are multiplied together, and the nth root of the product is taken, where n is the number of observations. Geometric mean of skewed distribution such as hair mercury concentrations usually produces an estimate which is much closer to the true center of the distribution than would an arithmetic mean.

- **Median:** A statistical term used to describe the middle value obtained when all values in a dataset are placed in numerical order; at most half the observations in a dataset are below the median and at most half are above the median.
- **Public Water System:** A community water system with 5 or more connections, that has a distribution system (piped) and that may also have a truck fill station.
- **Private Well:** A well for drinking water serving a residence or house.
- **Recommended Dietary Allowance (RDI):** The estimated average daily nutrient intake level that meets the needs of nearly all (98%) healthy individuals in an age or gender group.
- **Semi Public Water System (SPWS):** A well or cistern serving a public building(s) or where the public has a reasonable expectation of access and has less than 5 connections.
- **Surface water:** All water situated above-ground (for example, rivers, lakes, reservoirs, streams, seas, etc).
- **Tolerable Daily Intake (TDI) or Provisional Tolerable Daily Intake (PTDI):** An estimate of the amount of a substance in air, food or drinking water that can be absorbed or consumed daily over a lifetime without appreciable health risk. TDIs or PTDIs are calculated on the basis of laboratory toxicity data to which uncertainty factors are applied.
- **Water treatment plant:** The facility that treats water so that it is clean and safe to drink.
- **Water treatment system (WTS):** Includes all water delivery components such as the raw water intake, water treatment plant, distribution system, hydrants, etc.

- **µg/g**: Micrograms (1 millionth or 1/1,000,000 of a gram) per gram; in the mercury in hair results, this measurement represents the weight of mercury measured per gram of hair. In the food contaminant results, this represents the weight of a contaminant per gram of food.
- **µg/L**: Micrograms (1 millionth or 1/1,000,000 of a gram) per litre; in the drinking water results, this measurement represents the weight of trace metals measured per litre of water.
- **ng/g**: Nanograms (1 billionth or 1/1,000,000,000 of a gram) per gram; in the food contaminant results, this measurement represents the weight of a contaminant measured per gram of food.
- **ppm**: Parts per million; this is approximately equivalent to one drop of water diluted into 50 litres (roughly the fuel tank capacity of a small car).
- **ppb**: Parts per billion; this is approximately equivalent to one drop of water diluted into 250- 55 gallon containers.
- **pg/kg/day**: Picograms (1 trillionth or 1/1,000,000,000,000 of a gram) per kilogram per day; in the food contaminant results, this represents the weight of contaminants per kilogram body weight that is being consumed per day. This value is used for risk assessment.

## EXECUTIVE SUMMARY

In recent years, First Nations have been concerned about the impacts of environmental pollution on the quality and safety of harvested traditional foods. Although some studies have been carried out in collaboration with First Nations, very little is known about the diet of First Nations or about the level of contaminants that may be present in traditional foods. This study attempts to fill the gap in knowledge about the eating habits and food security of First Nations peoples living on-reserve, south of the 60<sup>th</sup> parallel. In addition, baseline information on human and veterinary pharmaceuticals in surface waters, such as where fish are being harvested or where water is being taken for drinking purposes, was collected.

This study, called the First Nations Food, Nutrition and Environment Study (FNFNES) is being implemented region by region over a 10-year period. Data collection was conducted in the fall of 2014 in 11 First Nation communities in the Atlantic region. Individuals 19 years of age and over, living on-reserve and who self-identified as First Nations were invited to participate in the study. This report documents the data collected from Eel Ground First Nation. The specific results concerning your community are not shared externally. A regional report presenting the aggregated results for all 11 First Nations in the Atlantic region will be published, with a print copy mailed to your First Nation and made available electronically on the FNFNES website ([www.fnfnes.ca](http://www.fnfnes.ca)).

The FNFNES includes five components:

- 1) Household interviews to collect information on dietary patterns, lifestyle and general health status, environmental concerns, and food security
- 2) Drinking water sampling for trace metals
- 3) Surface water sampling for pharmaceuticals
- 4) Hair sampling for exposure to mercury
- 5) Traditional food sampling for contaminant content

This study was guided by the principles of Ownership, Control, Access and Possession (OCAP™), the Canadian Institutes of Health Research Guidelines, “Health Research Involving Aboriginal peoples” and the Tri-Council Policy Statement, “Ethical Conduct for Research Involving Humans”. Ethical approval has been granted by the Research Ethics Board of Health Canada, the University of Ottawa and the Université de Montréal.

## **Results**

There were 100 participants (one participant per household) from Eel Ground First Nation (66 women and 34 men). From the 11 participating First Nations communities in the Atlantic region, there were a total of 1025 participants (670 women and 355 men).

The average age of Eel Ground First Nation participants was 48 years old for women and 42 years old for men. The median number of years of school completed in Eel Ground First Nation was 12 years and 55% of households had at least one person with employment.

Nineteen percent of participants from Eel Ground First Nation were at a healthy weight, 32% of participants were overweight and 49% were obese. Overall, the rates of excess body weight were higher than in the general

Canadian population. This can lead to an increased risk of diabetes and heart disease. Twenty-three percent of Eel Ground First Nation participants reported having diabetes.

The amount of traditional food consumed in Eel Ground First Nation when averaged over all days of the year, was 16 grams (about 1 tablespoon) per person, per day. Salmon, moose and lobster were the most popular traditional foods eaten in Eel Ground First Nation. Three quarters of all families (76%) reported that they would like to have more traditional food. However, multiple barriers to increased use were reported, including lack of: a harvester, knowledge and time.

Many households (40%) in Eel Ground First Nation are food insecure; 27% of households are moderately food insecure and 13% are severely food insecure. Food costs are a contributing factor to food insecurity. Groceries cost \$227 per week to feed a family of four in Eel Ground First Nation, which is \$14 more compared to the cost in Moncton (\$213). The relatively high percentage of households relying on social assistance (31%) may also explain this high rate of food insecurity.

In terms of overall diet quality, First Nations adults in the Atlantic region do not meet the amounts and types of food recommended in Canada's Food Guide. The number of food guide servings for the Meat and Alternatives group is higher than recommended. For the other three food groups (Milk and Alternatives, Vegetables and Fruit, and Grain Products), intakes are lower than recommended, particularly among women.

Many nutrients that are needed for good health and prevention of disease, including fibre, vitamin A, vitamin B6, vitamin C, vitamin D, calcium, folate and magnesium, are at risk of insufficient intake. Overall, saturated fat and salt consumption was too high.

Across the Atlantic region, diet quality was better on days when traditional foods were consumed, as traditional foods are important contributors of protein, iron, zinc, vitamin D, vitamin B6, B12 and other essential nutrients.

Most Eel Ground First Nation homes receive treated drinking water from a community treatment plant while some homes are on a private well. The water source is groundwater.

In Eel Ground First Nation, 20 tap water samples from participants' homes were analyzed on-site for chlorine, pH and temperature. Four samples had chlorine levels below the level required for disinfection. The pH measurements for all water samples were within the optimal range. Temperature measurements for all were within or above Health Canada's aesthetic guidelines of 15°C.

Tests for trace metal levels that would affect the quality of drinking water with respect to human health found all values to be below guideline levels when flushed. Tests for levels of trace metals that would affect the taste, colour or smell of the water were found to be elevated in 20 homes for manganese. These levels would not pose a threat to human health.

A total of three surface water samples were collected to test for 42 pharmaceutical products. A total of 2 pharmaceuticals (metformin and

atenolol) were detected in the surface water samples collected near Eel Ground First Nation.

Mercury was measured in hair samples collected from 84 participants in Eel Ground First Nation (632 from across the Atlantic region). Hair mercury levels among all participants in Eel Ground First Nation and across the Atlantic were within acceptable levels.

A total of 135 traditional food samples representing 38 different food species were collected from Eel Ground First Nation for contaminant analysis. Results showed levels of contaminants typically found across Canada. However, squirrel meat samples were found to have high levels of lead, most likely a result of contamination from lead-containing ammunition used in hunting.

In October 2016, FNFNES returned to the community to share the results and obtain feedback before finalizing the report. Eight individuals attended the presentation at the Health Centre. The food security results were considered to be accurate. There was some surprise about the limited amount of traditional food consumed, given the salmon fishing culture. Attendees felt it would be valuable to both repeat the study to monitor changes and to include youth as well. Interest was also expressed in learning more about the impacts of pharmaceuticals on aquatic and human health.

Thus far, this study has been a valuable tool in addressing the gaps in knowledge about the foods consumed, including traditional foods, and the environmental contaminants to which First Nations in the Atlantic region are exposed through food and water. It should be noted that this is the first study

of this type to be done on a regionally representative scale across the country. The data collected will serve as a benchmark for future studies to determine if changes in the environment are resulting in an increase or decrease in concentrations of chemicals of concerns and how diet quality will change over time.



For more information, please contact:

Lynn Barwin

FNFNES National Coordinator

Email: [fnfnes@uottawa.ca](mailto:fnfnes@uottawa.ca)

Phone: 613-562-5800 ext. 7214

Website: [www.fnfnes.ca](http://www.fnfnes.ca)

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The information and opinions expressed in this publication are those of the authors/researchers and do not necessarily reflect the official views of Health Canada.

# SUMMARY OF RESULTS FOR EEL GROUND FIRST NATION

## First Nations Food, Nutrition and Environment Study (FNFNES)



University of Ottawa  
Université de Montréal  
Assembly of First Nations

**Summary of Results:  
Eel Ground First Nation**

Atlantic 2014

### Who participated?

66



Ages: 20-76



100

2 is the average # of people living in each home

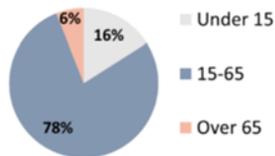
43% of households had at least 1 adult working full-time

34



Ages: 23-64

Age distribution of households:



### What is the FNFNES about?

The FNFNES took place in **11 First Nations** communities in the Atlantic region in 2014 to answer these questions:

- What kinds of traditional and store bought foods are people eating?
- What is the diet like?
- Is the water safe to drink?
- Are the levels of pharmaceuticals in the water safe?
- Are people being exposed to harmful levels of mercury?
- Is traditional food safe to eat?

### What were the findings on health?

**3 out of 5** adults reported that their health was **good to excellent**



**1 in 2** is physically active



**1 in 5 adults** is at a healthy weight



**1 out of 4 adults** has diabetes  
Type 2 diabetes is more common



**1 out of 2** smoke

**Thank you to everyone who participated!**

## Can households afford sufficient, safe and nutritious food?



Household food security is defined as “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.”

**40%** of households are **food insecure**

**27%** are moderately food insecure: families relied on lower quality/priced foods

**13%** are severely food insecure: families regularly experience food shortages

**Weekly cost of groceries for a family of four\*:**



**Eel Ground  
First Nation**



**Moncton**

\*Costing was done using the National Nutritious Food Basket which is a list of 67 basic food items. Foods that require preparation, spices, condiments, household supplies or personal care items are not included. Transportation costs are not included.

## How well are First Nations adults in the Atlantic eating?

Adults **eat fewer than** the recommended servings of:



Grain Products



Vegetables and Fruit



Milk and Alternatives

Adults **eat** the recommended servings of:



Meat and Alternatives

Inadequate amounts can lead to **nutrient deficiencies** and **poor health**.

## What and how much traditional food are people eating?

**16 grams** or **1 tablespoon** daily



**3 out of 4** want more. **Top barriers** to greater use are lack of the following:

- harvester in the household
- knowledge
- time

**3 out of 5** households harvested traditional food  
**2 in 5 fished**  
**1 in 4 hunted**  
**1 in 4 harvested wild plants**

The **top 5** traditional foods eaten were: salmon, moose, lobster, blueberries and strawberries.



### Nutrition Recommendations:

- Choose more vegetables and fruit, including wild plants and berries.
- Choose whole wheat grains more often. Make baked bannock with whole wheat flour.
- Choose milk and milk products (such as cheese or yogurt) or beverages fortified with calcium and vitamin D (such as soy beverages) more often.
- Choose leaner meats, plus game and fish.

## Is the water safe to drink?



**63%** of households **drink** tap water.

**Unpleasant taste** was the most common reason given for not drinking tap water.

**98%** of households **cook** with tap water.

### Testing of tap water in **20** homes found

levels of **10** metals that can **affect health** **were within guidelines**.

levels of **6** metals that can **affect colour, taste, or smell** were low **except for manganese** in **20** homes. The elevated levels are not harmful to health but can cause the water to have a strong metallic taste, which might discourage people from drinking it.

## Are the levels of pharmaceuticals in the water safe?



**2** pharmaceuticals were found in the **surface water samples**.

Types found were: metformin (diabetes medication) and atenolol (heart med).

The **low levels** should not be a concern for human health.

## Are people being exposed to harmful levels of mercury?

**84** hair samples were collected from adults at **Eel Ground First Nation**.

Levels of **mercury** **were within** Health Canada's guideline **normal acceptable range** for all participants.



## Is traditional food safe to eat?



**135** samples from **38** species were collected.

**Fish** brook trout, crab, lobster, salmon, shad, smelt, striped bass, white sucker

**Game:** deer, moose, rabbit, squirrel

**Birds:** grouse

**Plants: Berries:** blackberries, blueberries, cranberries, raspberries

**Greens/roots:** fiddleheads; **Teas:** bergamot, dandelion, Labrador, mint, raspberry leaf, muskrat root, teaberry, yarrow, hemlock bark, maple-bark, spruce, tamarack, white cedar needle, white pine cone, yellow birch bark **Tree foods:** crabapple, hazelnut; **Garden vegetables:** corn, rhubarb, squash seeds, sunflower seeds

### **Traditional food is safe and healthy to eat.**

There is some uncertainty about contaminant levels in some traditional foods due to limited (<5) samples. However, contaminant exposure from traditional food is low .

### Recommendations

- To help protect the environment, **return all unused medications to local pharmacies** for proper disposal.
- **Use non-lead ammunition.** Ammunition can shatter and fragments can be **too small to detect** by sight or feel. Eating wild game contaminated by lead shot can be harmful to health, especially to a child's brain development.

**Key Results for All Participating First Nations in the Atlantic:**

1. The diet of First Nations adults in the Atlantic does not meet nutrition needs, but the diet is healthier when traditional foods are eaten.
2. Overweight/obesity, smoking, and diabetes are major public health issues.
3. Household food insecurity is a major issue.
4. Water quality, as indicated by the trace metals and pharmaceutical levels, is overall satisfactory, but close monitoring is needed as water sources and water treatment vary by community.
5. Mercury exposure, as measured in hair samples and calculated through dietary estimates, is not a health concern.
6. Levels of chemical contamination of traditional food are generally low and together with the limited consumption, the total dietary contaminant exposure from traditional food is low.
7. Elevated levels of lead were found in some food items from a few communities: it is important to identify the sources.
8. Future monitoring of trends and changes in the concentrations of environmental pollutants and the consumption of key traditional foods is needed.



**More information can be found on the FNFNES website: [www.fnfnes.ca](http://www.fnfnes.ca)**

If you have any questions about these results or the project itself, please contact:

Lynn Barwin, FNFNES National Coordinator

Phone: (613) 562-5800 ext 7214

Email: [fnfnes@uottawa.ca](mailto:fnfnes@uottawa.ca)

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## INTRODUCTION

Traditional food is nutritionally, culturally, and economically important for First Nations peoples. However, as people eat less traditional food and more store-bought food, there is a risk of a decrease in diet quality, which could lead to an increase in nutrition-related health problems such as anemia, heart disease, obesity, osteoporosis, cancer, infections, diabetes, and tooth decay (Kuhnlein and Receveur, 1996). The move away from eating traditional foods has been attributed to a multitude of factors including but not limited to: loss of control over traditional territories; ecosystem degradation and changes in access to and availability of foods as a result of human activities (forestry, fishing, mining, hydro, farming, urban growth); climate change; change in lifestyles; loss of traditional knowledge; and economic constraints that limit ability to participate in harvesting.

Increasing industrialization in the last 60 years has led to global distribution of pollutants, now evident in all ecosystems. First Nations communities from different geographical areas in Canada face their own unique environmental problems due to the nature of point sources of environmental pollution, the effects of climate change and the degree to which their diet is obtained from

the local environment. It has been suggested that major health problems (such as cancer, diabetes, and low infant weight) may also be related to the amount of chemical contaminants in the environment (Hectors, 2011; Lee et al, 2011; Institute of Medicine, 2007). However, the risks and benefits of traditional food must be better understood before recommendations can be made. Unfortunately, both the nutritional composition of the average diet of most First Nations and the levels of contaminants in their traditional foods are largely unknown.

Although there have been a number of dietary studies conducted in First Nations communities since the 1970s that provide a general understanding of the types of foods consumed by some First Nations on reserves, research to date has not succeeded in providing reliable regional information on First Nations' food and nutrient intake and food-related exposures to environmental hazards. This gap is targeted by this study titled the "First Nations Food, Nutrition and Environment Study (FNFNES)".

The main objectives of this 10-year study are to provide reliable information on First Nations' food and nutrient intake, and food and water-related exposures to environmental contaminants from 100 First Nations communities across Canada. The goal of this study is to provide information

needed for the promotion of healthy environments and healthy foods for healthy First Nations. Results of this study will be useful for targeting dietary advice and guidance on food intake for First Nations. The information on exposure to environmental contaminants is also essential for First Nations as a monitoring tool at the community level. Results of this study are expected to empower communities to make informed decisions to address and decrease health risks including those related to the environment.

FNFNES aims to be representative of all First Nations south of the 60<sup>th</sup> parallel at a regional level in Canada. The study is being undertaken in the eight Assembly of First Nations regions. This study is supported by a resolution passed by the Chiefs-in-Assembly in Halifax, Nova Scotia in 2007. The study was first implemented in 2008 and 2009 in British Columbia, with data collection in 21 First Nations in British Columbia. Data collection has since been conducted in nine First Nations in Manitoba (2010), 18 First Nations in Ontario (Fall 2011 and 2012), and 10 First Nations in Alberta (2013). The results of the four regional studies conducted to date are published in reports that are available on the FNFNES website ([www.fnfnes.ca](http://www.fnfnes.ca)). In the fall of 2014, data collection was carried out in 11 First Nations communities in the two Assembly of First Nations Atlantic regions

(New Brunswick/Prince Edward Island and Nova Scotia/Newfoundland).

This report presents the results from Eel Ground First Nation.

## **METHODS**

To ensure that the cultural and ecosystem diversity of First Nations in Canada is represented in this study, communities are being selected using an ecozone and AFN region framework. Ecozones are large scale divisions of the earth's surface based on the distribution of plants and animals (Smith & Marshall, 1995). See [www.ecozones.ca](http://www.ecozones.ca). First Nations communities, south of the 60<sup>th</sup> parallel are located within eleven ecozones in eight AFN regions. In 2014, FNFNES was undertaken in the two Assembly of First Nation regions in the Atlantic: New Brunswick/Prince Edward Island (NB/PEI) and Nova Scotia/Newfoundland (NS/NFLD). There are 17 (NB/PEI) and 14 (NS/NFLD) communities with individuals living on-reserve. In the NB/PEI AFN region, all communities are located within the Atlantic Maritime ecozone. In the NS/NFLD AFN region, 13 First Nations communities are situated in the Atlantic Maritime while one community is located in the Boreal Shield. From each of the two AFN regions, six communities were allocated to participate. Results from the two AFN regions are combined and presented as the 'Atlantic region' or the Atlantic.

The communities were selected using a systematic random sampling method with probability proportional to the size of communities. This selection method ensures that the most populated communities are more likely to be chosen in the sample rather than the smallest ones. The sole community from the Boreal Shield was pre-selected and eleven communities were randomly selected. Of the five communities randomly selected in the NB/PEI region, three declined to participate and alternate communities were approached. One community that chose not to participate did not have an alternate. Of the five communities randomly selected in the NS/NFLD region, two communities decided not to participate and the alternate communities were invited. By summer 2014, 11 communities agreed to participate. The participating communities (Figure A) within the NB/PEI region were: Woodstock First Nation, Saint Mary's First Nation, Eel Ground First Nation, Esgenoopetitj First Nation, and Elsipogtog First Nation. In the NS/NFLD AFN region, participating communities were Pictou Landing First Nation, Waycobah First Nation, Potlotek First Nation, Eskasoni First Nation, Membertou First Nation and Miawpukek First Nation. Within each community, households were randomly selected. From each household, one adult was randomly selected. The sample is considered representative of

92% of First Nations in the Atlantic. As one community did not participate, the sample is not considered representative of all First Nations in this region.

In early 2014, the Assembly of First Nations invited your community to participate in the study. In the summer of 2014, Chief and Council agreed to participate and a community research agreement was signed. In September, Community Research Assistants (CRAs) were recruited and trained to complete the work outlined below during the months of September to December. During this time, they were supported by the community coordinator, Gail Hanifan, and Teri Morrow, a Nutrition Research Coordinator (NRC) contracted by the FNFNES.

Figure A. Map of 11 participating First Nations in the Atlantic

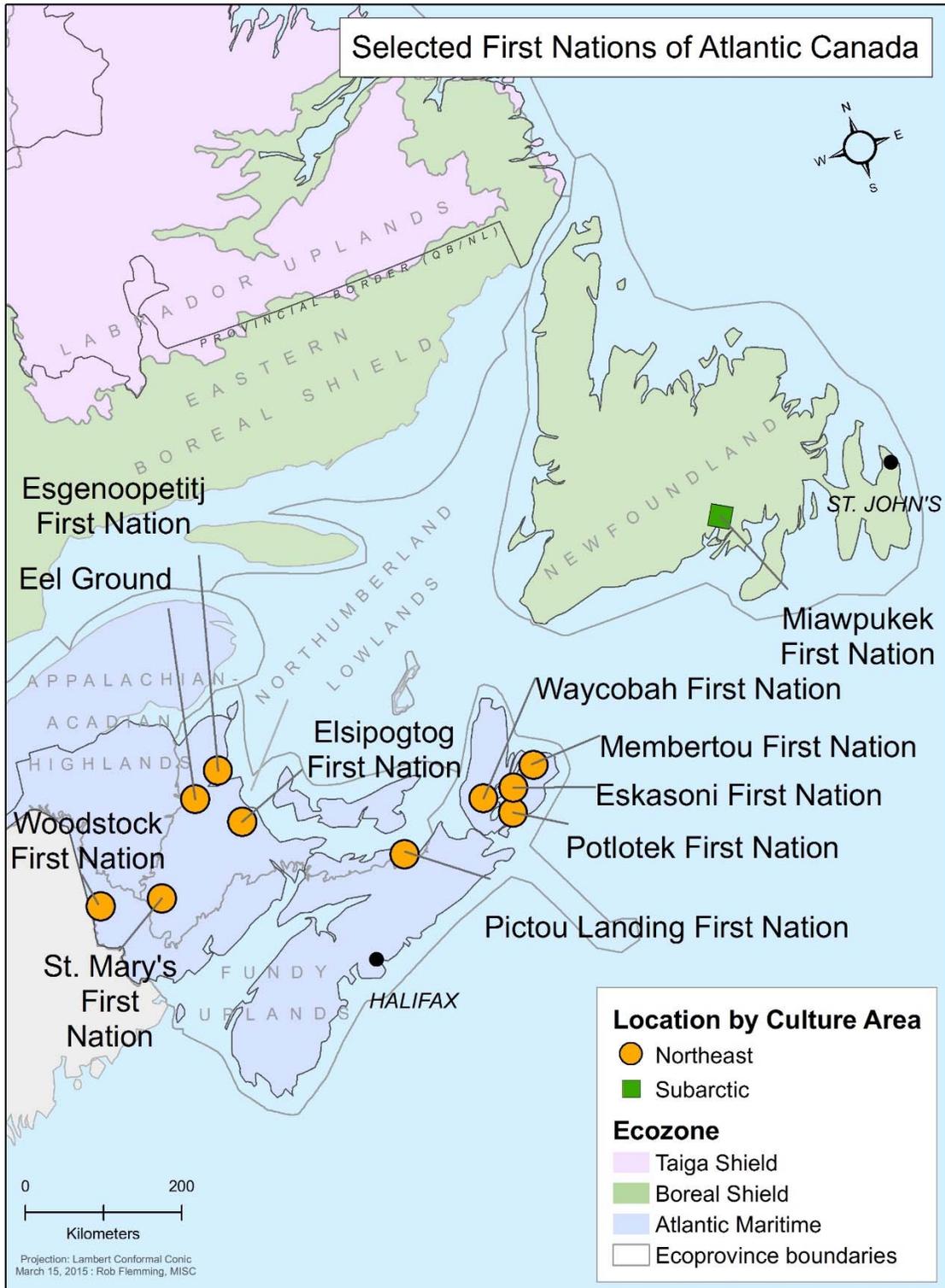
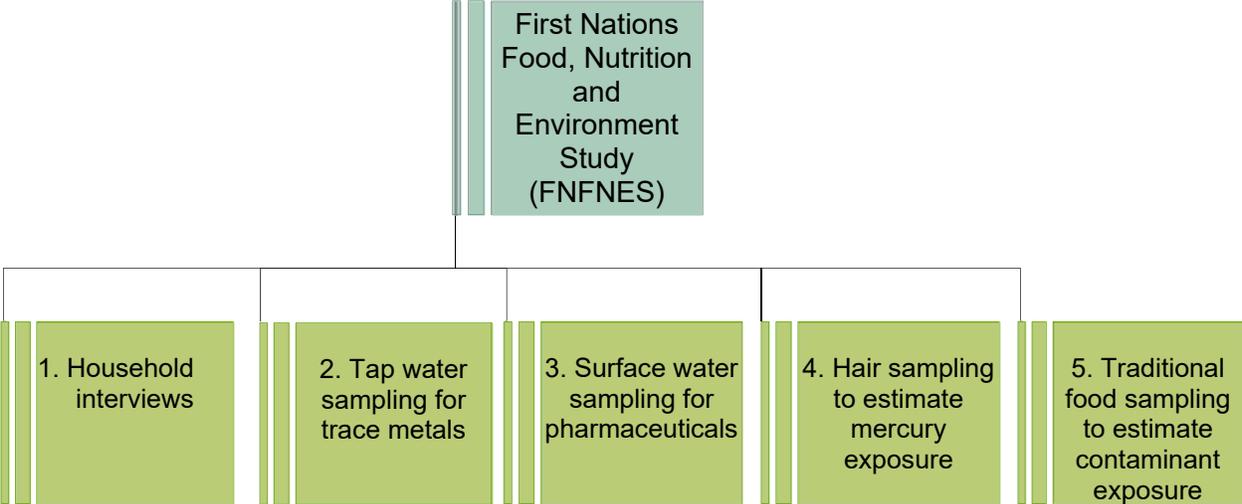


Figure B outlines the five components of the FNFNES. Each of these components is described below in further detail.

Figure B. The five study components of the FNFNES





## 1. Household Interviews

In each community, community research assistants were asked to complete up to 100 household interviews. Households were randomly selected from available community housing lists. In each home, the adult asked to participate:

- was 19 years of age or older,
- was able to provide written informed consent,
- self-identified as a First Nations person living on-reserve in the Atlantic,
- had the next birthday.

Before starting the interview, the CRA explained the purpose of the study. If the person agreed to participate, an informed consent form was completed. Each person who completed an interview was asked a series of questions

about traditional and store-bought food, health, lifestyle, household, education, income, climate change, and affordability of food. More detail on these questionnaires is provided below. Complete interview forms are available at the study's website: [www.fnfnes.ca](http://www.fnfnes.ca).

### ***Traditional Food Frequency Questionnaire (TFFQ)***

The TFFQ asks the participant to describe how frequently they ate any of the more than 150 kinds of traditional food available in the Atlantic region over the past four seasons. The traditional food list was developed based on a review of existing information about traditional food available in the Atlantic and after discussion with representatives of each participating community. For the purposes of this study, each of the four seasons consisted of 90 days. The following chart was used as an aid when the respondent had difficulty coming up with a precise estimate of how often a food was eaten:

Frequency	Average days/season
Very Rarely (< 1 day/month)	2 days/season
Rarely (1-2 days/month)	6 days/season
Quite Often (1 day/week)	12 days/season
Often (2-3 days/week)	30 days/season
Very Frequently (4-5 days/week)	54 days/season
Almost every day (5-7 days/week)	72 days/season

### ***24-Hour Food Recall***

This questionnaire requires the participants to report all the foods and beverages (except alcohol-containing beverages) consumed 24 hours prior to the interview. The data collected provides information on the amounts and types of foods consumed, which allows for the assessment of diet quality, including intake of nutrients.

### ***Socio/Health/Lifestyle Questionnaire (SHL)***

The SHL questionnaire included questions on the following topics:

- General health
- Height and weight (either measured or self-reported)
- Vitamin and dietary supplement use
- Physical activity
- Smoking
- Traditional food availability
- Socio-demographic characteristics
- Economic activity

### ***Food Security Questionnaire***

The Food and Agricultural Organization of the United Nations defines food security as “when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary

needs and food preferences for an active and healthy life” (Food and Agriculture Organization, 2002). Food *insecurity* can present itself in many ways including, but not limited to: worrying that there will be some food shortages before more money is available, limiting the variety of foods that you would like to serve your family, cutting down or skipping meals or not eating for a whole day.

The questionnaire used in this project is the income-related Household Food Security Survey Module (HFSSM) (Health Canada 2007) adapted from the food security module developed in the U.S. (Bickel et al. 2000). It consists of 10 questions for adult household members plus 8 questions for households with children.

To be classified as food secure, a household responded affirmatively to a maximum of one answer on either the 10 questions related to adult food security or the 8 questions related to child food security. Moderately insecure households were identified by 2-5 affirmed answers on the adult-related questions or 2-4 affirmed answers on the child-related questions and, severely food insecure households, by 6 or more affirmed answers on the adult survey section or 5 or more on the child survey section. Households experiencing ‘moderate food insecurity’ may rely more on

lower quality foods whereas ‘severely food insecure’ households would experience regular food shortages. The following chart displays the categorization of food security status based on this three-category classification method:

<b>Category Labels</b>	<b>Category Description</b>	<b>Score on 10-Item Adult Food Security Scale</b>	<b>Score on 8-Item Child Food Security Scale</b>
Food Secure	no, or one, indication of difficulty with income-related food access	0 or 1 affirmed responses	0 or 1 affirmed responses
Food Insecure, Moderate	indication of compromise in quality and/or quantity of food consumed	2 to 5 affirmed responses	2 to 4 affirmed responses
Food Insecure, Severe	indication of reduced food intake and disrupted eating patterns	≥6 affirmed responses	≥5 affirmed responses

## 2. Tap Water Sampling



To measure the level of trace metals<sup>1</sup> in the community water system(s), 20 households that participated in a household interview were asked to provide drinking water samples. Households were asked to collect a drinking water sample after the water had not been used overnight

and a second water sample was taken after the tap had been left open to let the water run for five minutes.

Selection of sampling sites was based on what would be considered representative of the distribution system, i.e. at the ends of pipelines and at miscellaneous points in-between the ends of the pipelines and the treatment plant. Maps were used to help with site selection. In addition, if a household in the community was accessing a source of drinking water that was not part of the community water supply system, such as a well, nearby spring, or a trucked in water source, these were also sampled.

Community-based treatment plant operators were asked a series of questions about the water treatment and distribution system. The information

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<sup>1</sup> This study determines the chemical safety of the community water supplies. The bacteriological safety is monitored regularly by Environmental Health Officers (EHO).

was gathered to build a profile of the water supply system of the participating communities, and used to help interpret the results of lab testing of the water samples.

At the time of collection, temperature, pH and chlorine were measured. The water samples were shipped to an accredited lab for metal testing. FNFNES measured ten metals that are of concern to human health when the maximum acceptable concentration (MAC) of the Guidelines for Canadian Drinking Water Quality (Health Canada, 2014) is exceeded:

- Antimony
- Arsenic
- Barium
- Boron
- Cadmium
- Chromium
- Lead
- Mercury
- Selenium
- Uranium

In addition, six metals not considered hazardous to health, but for which an aesthetic objective has been set by Health Canada, were also measured. These were: aluminum, copper, iron, manganese, sodium and zinc.



### **3. Surface Water Sampling for Pharmaceuticals**

Eel Ground First Nation was sampled for 42 pharmaceuticals used for human health, veterinary purposes, or aquaculture. Samples were collected from the shoreline at three surface water sites chosen by the community.

The sampling sites were:

1. Miramichi River downstream from the lagoon outfall;
2. Fishing area at Miramichi River; and a
3. Salmon fishery site at Miramichi River.



#### **4. Mercury in Hair Sampling**

A bundle of hair approximately the diameter of a pencil (0.5cm) was isolated and cut from the back of the participant's neck. The hair bundle (full length, as cut) was placed in a polyethylene bag and fastened to the bag with staples near the scalp end of the hair bundle. For participants with very short hair, approximately 10 milligrams of hair were trimmed from the base of the neck onto a piece of paper. The paper was folded and stapled, then placed in a polyethylene bag.

The hair sample, accompanied by a duly filled-in Chain of Custody form, was sent by the study coordinator to the laboratory for analysis. Hair samples were analyzed in the Standards Council of Canada (SCC) accredited Health Canada Regions and Programs Bureau Québec Region Laboratory in Longueuil, Québec. No information that could be used to identify the participant was sent to the Health Canada lab.

Resulting values, in parts per million (ppm) were converted to equivalent values for mercury in blood that are expressed in parts per billion (ppb) in the result tables. This conversion was done in order to compare each community's results with those recently published for the general Canadian population.



## 5. Food Sampling for Contaminants<sup>2</sup>

Traditional food samples were collected on the basis of a traditional food list compiled by knowledgeable community members and the traditional food frequency questionnaires so that collected foods represented at least 80% of the traditional foods consumed that season/year in the region. The food-sampling strategy was as follows:

- Up to 30 food samples were to be collected from each participating community.
- The community was to identify the most commonly consumed food; the foods that are of the most concern from a nutrition, environmental or cultural perspective; and, based on existing knowledge, foods that are known to accumulate higher concentrations of contaminants.
- Each of the food samples was a combination of samples from up to five different animals or plants.

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<sup>2</sup> FNFNES is studying the chemical safety of traditional food. The bacteriological safety is monitored by the community's EHO.

The traditional food samples collected were analyzed for the following categories of toxic chemicals:

### **Metals**

- Trace elements and heavy metals

### **Persistent Organic Pollutants**

- Perfluorinated compounds (PFCs)
- Polycyclic aromatic hydrocarbons (PAHs)
- Organochlorine residues
- Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDD/Fs), also known as dioxins and furans
- Polybrominated fire retardants (PBDEs)

All food samples were sent for analysis to ALS Global in Burlington, Ontario.

Fact sheets of the contaminants measured in this study can be found in

Appendix A at the end of this report.

# RESULTS

The results presented in this report are from a representative sample of 100 households from Eel Ground First Nation. As some questions were not always answered, there are different sample sizes (n) for some of the results. In many report sections, your community's results are compared to the overall regional results. For the purposes of this report, the data for all First Nations in the two AFN regions are labelled as "First Nations in the Atlantic" in the tables and figures. For some analyses (i.e. nutrient intake), there was an insufficient number of surveys at the community level. In these occurrences, results are presented for all First Nations participants in the Atlantic with no comparison values for your community.

## **1. Household Interviews**

### **a) Sample Characteristics**

Across the Atlantic, a total of 1025 participants (670 women and 355 men) participated in this study with 100 (66 women and 34 men) from Eel Ground First Nation (Table 1 and Table 2). CRAs attempted to contact and interview an adult in 105 households in Eel Ground First Nation. The participation rate (the number of people who participated divided by the number of people who were contacted and eligible to participate) for Eel Ground First Nation was

100% (100 out of 100 households). Your community's participation rate was higher than the overall rate of 90% for the Atlantic (1025 out of 1139 households) and is considered to be very high.

Table 1. List of participating First Nations communities in the Atlantic and number of participants

<b>Name of participating community</b>	<b>Number of participants</b>
Woodstock First Nation	61
Saint Mary's First Nation	86
Eel Ground First Nation	100
Esgenooetitj First Nation	99
Elsipogtog First Nation	92
Pictou Landing First Nation	89
Waycobah First Nation	100
Potlotek First Nation	98
Eskasoni First Nation	99
Membertou First Nation	100
Miawpukek First Nation	101
<b>Total participants from on-reserve First Nations communities in the Atlantic</b>	<b>1025</b>

Table 2. Number of households surveyed and participation rate in Eel Ground First Nation compared to First Nations in the Atlantic\*

<b>Population and Participation Statistics</b>	<b>Eel Ground First Nation</b>	<b>First Nations In the Atlantic*</b>	
On-reserve and crown land population **	566	13016	
On-reserve and crown land population 19+**	392	8349	
No of occupied households on reserve	235	3727	
No. of HHs selected to participate	125	1406	
No. of HHs contacted	105	1193	
Contacted 3 times but no response	0	27	
Not eligible	0	6	
Reason for non-eligibility	0	not living in community at time of survey, deaf, cognitive impairment, not First Nation	
No. of vacant homes	5	21	
No. of eligible HHs	100	1139	
HH Non-response	Refused	0	64
	Not home during interview period	0	33
	No. of incomplete records	0	18
No. of HHs (participants) that participated	<b>100</b>	<b>1025</b>	
No. of participating females	66	670	
No. of participating males	34	355	
HH Participation rate (# participating HHs / # eligible HHs)	<b>100%</b>	<b>90%</b>	

\*Information for First Nations in the Atlantic is from a representative sample for most First Nations (data were collected for 11 participating communities in FNFNES).

\*\*Population for individual communities obtained from INAC Indian Register data as of December 31, 2014 via personal communication, First Nations and Inuit Health 2015a. Summary statistics available at <https://www.aadnc-aandc.gc.ca/eng/1394032502014/1394032901691>

## **b) Socio-Demographic Characteristics**

In terms of age, adults who completed this survey from Eel Ground First Nation were older than participants from across the Atlantic (48 versus 42 years for women and 42 compared to 40 for males) (Table 3). When grouped into gender and age categories, there were fewer younger women (Figure 1) but a similar proportion of males in the three age categories compared to the Atlantic (Figure 2).

In participating Eel Ground First Nation households, 78% of individuals were between the ages of 15-65 years of age (Figure 3). There were less children (under 15 years of age) living on reserve in Eel Ground First Nation households (16%) but a similar percentage of elders (6%) compared to First Nations households across the Atlantic (20% contained children and 5% contained elders).

The median number of people living in Eel Ground First Nation households was 2. This means that half of the households in Eel Ground First Nation had two people living in them, compared to three people for all First Nations in the Atlantic (Table 4). The highest (maximum) number of people reported to be living in a household in your community was nine people, compared to 12 people for all First Nations households in the Atlantic.

In terms of education, half of the participants from Eel Ground First Nation reported completing 12 years of school, which was the same for all the Atlantic (Table 4). Figure 4 displays further results on education. Almost 3 out of 4 (72%) of participants from Eel Ground First Nation had completed high school; 55% obtained a high school diploma and 17% obtained a general education development (GED) certificate. This was similar to results for across the Atlantic (53% high school diploma and 15 % GED). A higher percentage of people from Eel Ground First Nation had obtained a vocational training certificate (47%) compared to all First Nations in the Atlantic (27%). As well, 33% of participants had obtained a post-secondary (college or university) degree compared to 32% across the Atlantic.

At the time of the study, just over half of the households (55%) in the community reported employment of any kind which was lower than households across the Atlantic (71%) (Figure 5). Forty-three percent of households in your community and 54% across the Atlantic reported that at least one adult was working full-time. The main source of income reported by participants was wages (40%), followed by social assistance (31%) and worker's compensation (18%) (Figure 6). The percentage of participants who reported social assistance as their main income in Eel Ground First Nation was similar to the rate of 32% reported across the Atlantic.

Table 3. Average age of participants

Gender	Average age in years (min, max)	
	Eel Ground First Nation (n=61)	First Nations in the Atlantic (n=1025)
Women	48 (20, 76)	42 (19, 84)
Men	42 (23, 64)	40 (19, 91)

Figure 1. Age group distribution of female participants

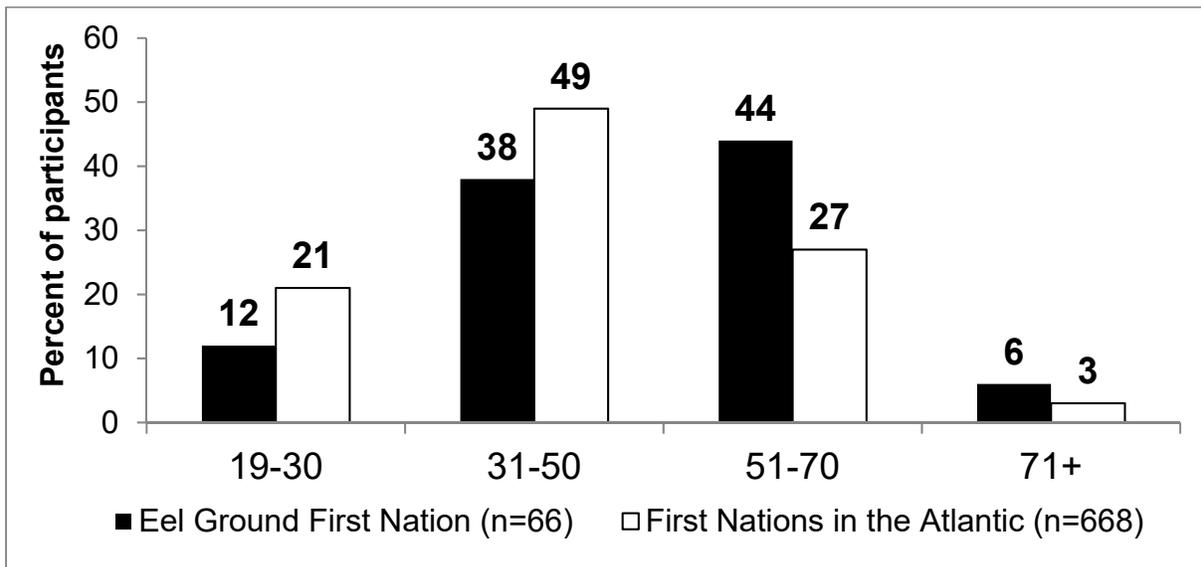


Figure 2. Age group distribution of male participants

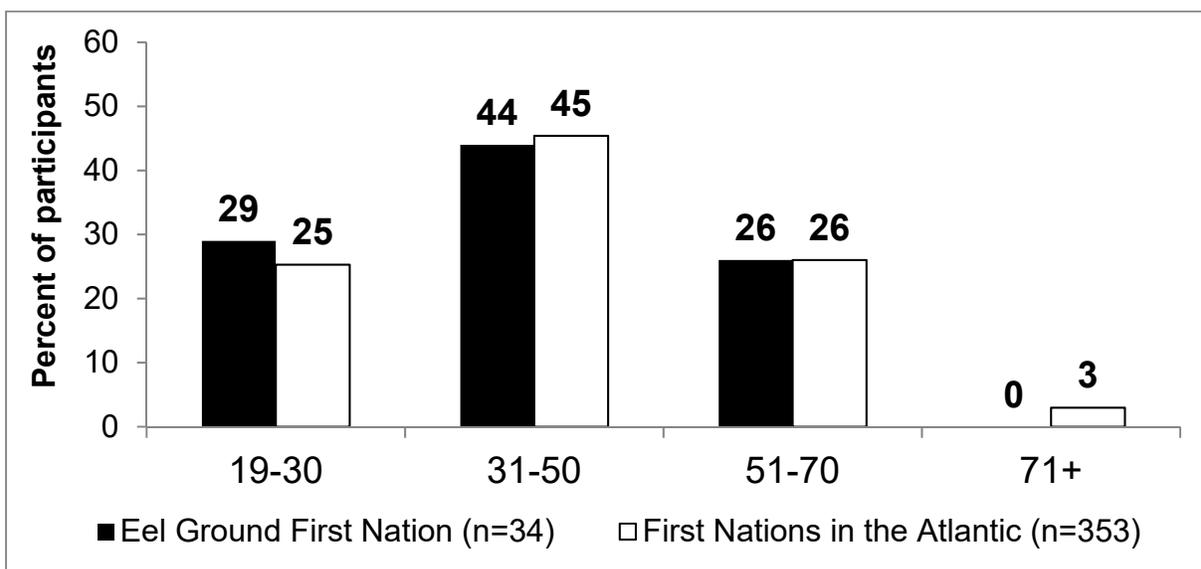


Figure 3. Percent of household members by age group, Eel Ground First Nation compared to all First Nations in the Atlantic

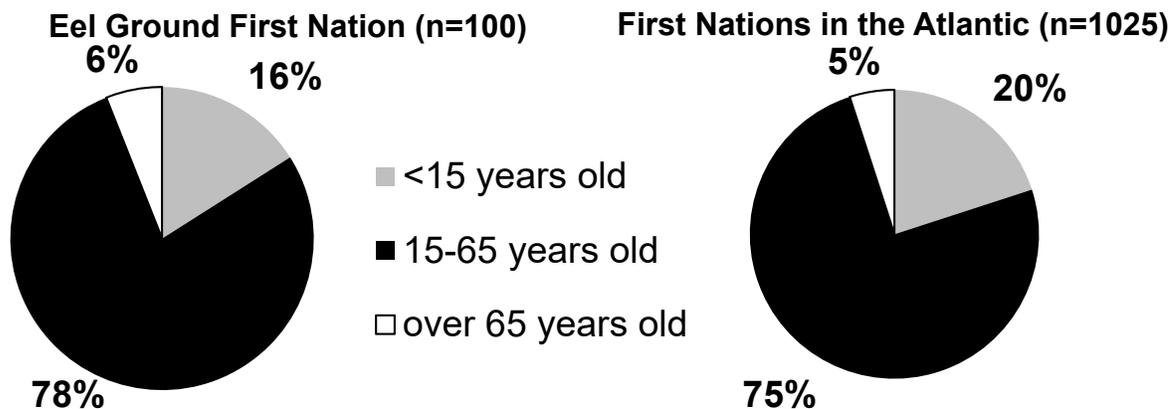


Table 4. Household size and education, Eel Ground First Nation compared to all First Nations in the Atlantic

Socio-demographic characteristics	Median (range)	
	Eel Ground First Nation (n=61)	First Nations in the Atlantic (n=1025)
Number of people in the household	2 (1 - 9)	3 (1 - 12)
Number of years of school completed	12 (4 - 21)	12 (0 - 23)

Figure 4. Diplomas, certificates and degrees obtained, Eel Ground First Nation compared to all First Nations in the Atlantic

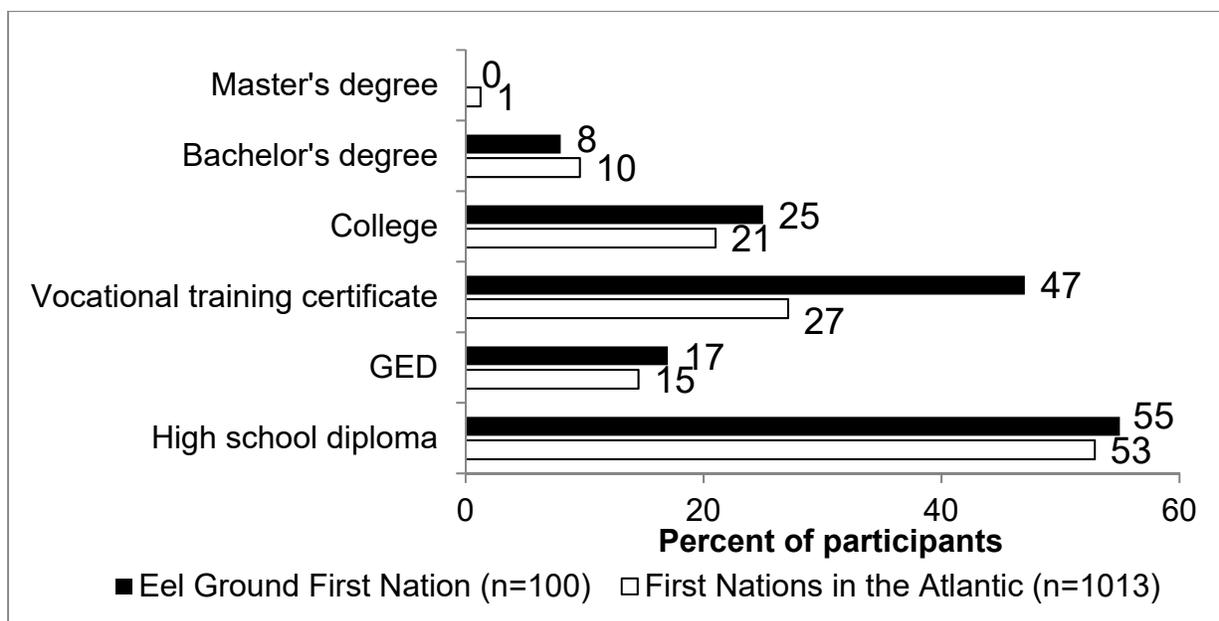


Figure 5. Percent of households with at least one person working, Eel Ground First Nation compared to all First Nations in the Atlantic

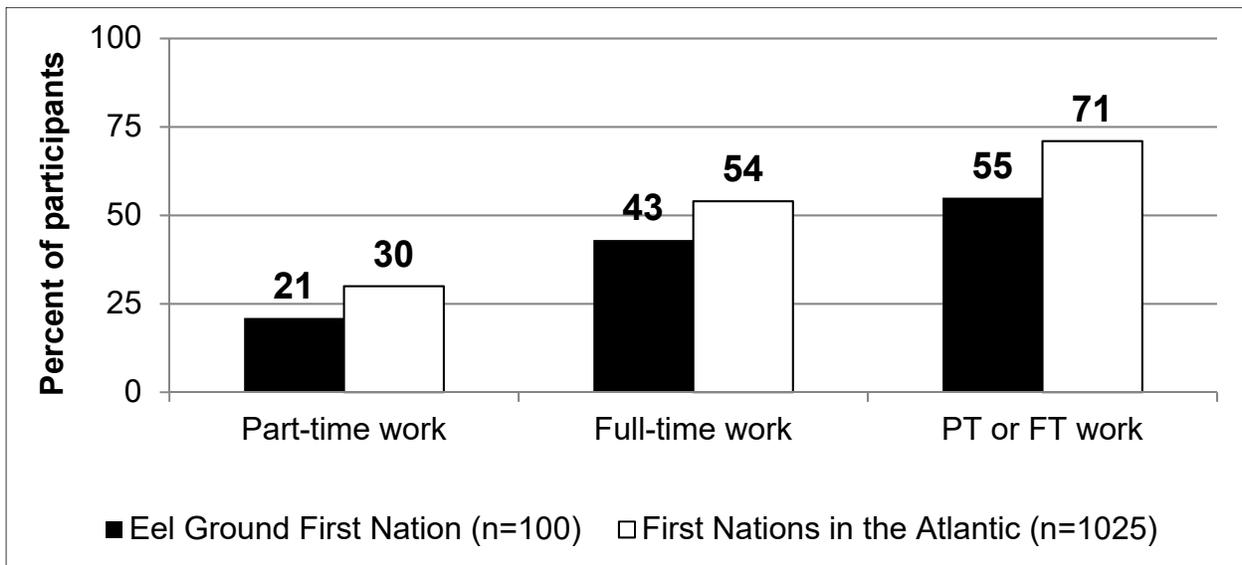
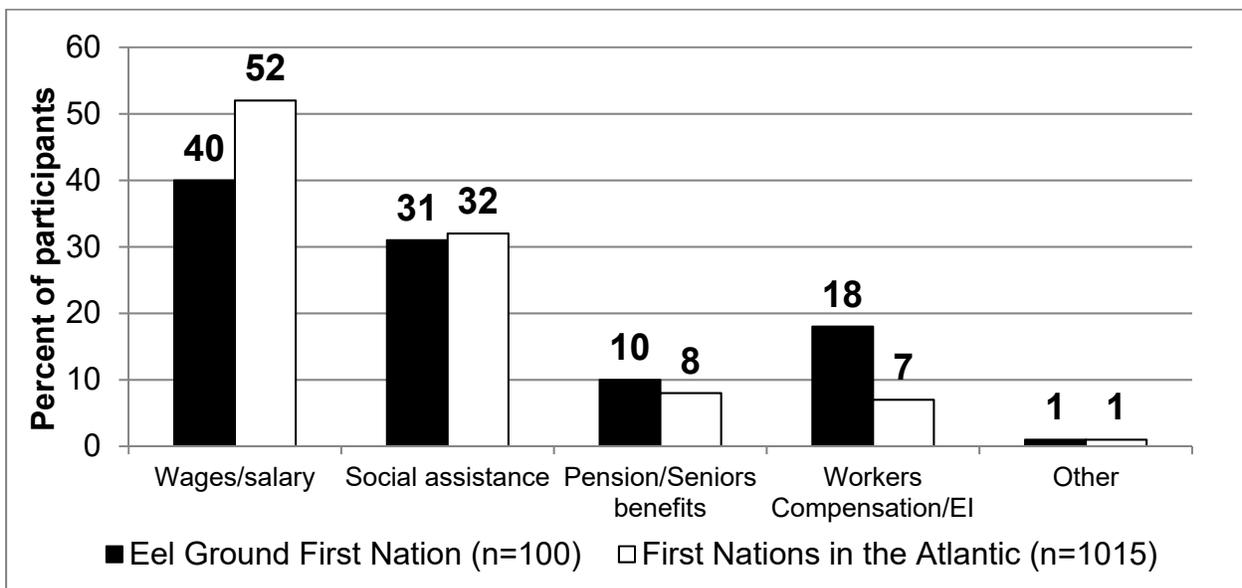


Figure 6. Main source of income for participants in Eel Ground First Nation compared to all First Nations in the Atlantic



### **c) Health and Lifestyle Practices**

In order to understand the relationships between diet, lifestyle and health risks participants were asked a series of health related questions. Height and weight measurements were both self-reported and measured for individuals who agreed to have these values recorded. Due to the small number of participants among men or women of certain age groups, results in this section could not be analyzed by age and gender. Results are presented for all participants from Eel Ground First Nation compared to all First Nations participants in the Atlantic and only the strongest trends can be commented on.

#### ***Body Mass Index, Obesity, and Diabetes***

A common method to assess whether health risk is elevated for both an individual and a population is the Body Mass Index (BMI). The BMI is calculated using a ratio of body weight to height and is an indirect measure of body fat relative to muscle mass. Individuals with a BMI less than 18.5 are categorized as underweight, while a BMI in the range of 18.5 to 24.9 is considered a normal weight. A BMI over 25 categorizes a person as overweight and a person with a BMI over 30 is obese. People who are underweight, overweight or obese are more likely to develop health problems

(see Appendix B for further information on the BMI). Based on BMI, 81% of adult participants from Eel Ground First Nation had unhealthy weights: 32% were overweight and 49% were obese (Figure 7). In this study, 79% of all participants in the Atlantic were at an unhealthy weight (31% were overweight and 48% were classified as obese). The obesity rates from this study are somewhat higher compared to findings from the First Nations Regional Health Survey (RHS) 2008/2010, which were based on self-reported height and weight. The RHS results for Nova Scotia indicated that 33% of adults were overweight and 43% were obese (UNSI 2013). No results are available for New Brunswick. Nationally, 34% of First Nations adults on-reserve are overweight and 40% are obese (First Nations Information Governance Centre [FNIGC], 2012). In the Canadian general population, based on measured weight and height data from the Canadian Community Health Survey (CCHS 2008), approximately 37% of adults aged 18 years and older are overweight and 25% are obese (Public Health Agency of Canada, 2011).

Obesity is a major risk factor for diabetes and heart disease. Twenty-three percent of participants from Eel Ground First Nation and one in five First Nations adults across the Atlantic (21%) reported having been told by a health care provider that they had diabetes (Figure 8). Type 2 diabetes was the most common form reported for all Atlantic participants (Figure 9). In the

Nova Scotia Region RHS report, 18.6% of adults reported that they had diabetes (UNSI, 2013). Figure 10 shows that 11% of participants from Eel Ground First Nation reported that they were dieting to lose weight the day before the interview. Overall, 10% of Nations participants were dieting.

### ***Smoking***

Almost half (49%) of the participants from this community indicated that they were smokers, which is similar compared to the regional rate of 52% reported in this study (Figure 11) and in the Nova Scotia RHS (52%) (UNSI, 2013). The rates found in this study are three times greater than the national smoking rate of 15% for all Canadians aged 15 and older and in New Brunswick (20%) (Reid, et al. 2015). The smoking rate among First Nations adults in the Atlantic is similar to the 57% rate reported nationally in the 2008/2010 RHS (First Nations Information Governance Centre (FNIGC) 2012). Across the Atlantic, First Nations adults in this study smoked an average of 13 cigarettes a day (just over half a pack). The daily number of cigarettes reported in this study is slightly below the Canadian average of 14 cigarettes a day (Reid et al. 2015).

The high rates of smoking and diabetes are troubling from a health perspective. Smoking promotes abdominal obesity and increases the risk of

diabetes by more than 30% (U.S. Department of Health and Human Services, 2014). Both smoking and diabetes cause hardening of the arteries and damage to the blood vessels, thus increasing the risk of heart disease for those who smoke and have diabetes. In fact, the risk of having a heart attack is 2-3 times greater for a smoker with diabetes compared to a non-smoker with diabetes, especially in women (Willet W. et al, 1987).

### ***Physical Activity***

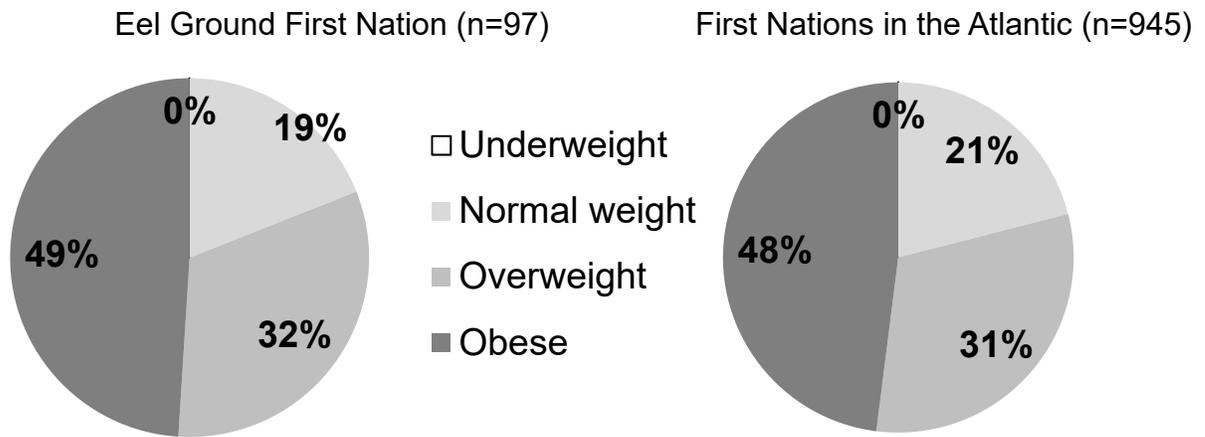
In your community and for all of the Atlantic, many people were ‘sedentary’ or ‘somewhat active’ (Figure 12). Half of the Eel Ground First Nation participants reported that they were ‘moderately’ (37%) or ‘highly active’ (13%), compared to 40% (29% moderately active and 11% highly active) for all communities.

### ***Self-Reported Health***

Adults were asked to rate their health using one of 5 categories (poor, fair, good, very good, excellent). The majority of participants in your community (70%) reported their health to be “good” or better, which was similar for the Atlantic (Figure 13). Seven percent of participants from your community said that their health was “poor”. Only 20% of adults in your community and 30% of all First Nations participants in the Atlantic perceived that their health was

“very good” or “excellent”. The perception of very good health in this study is much lower than reported in the 2008/2010 RHS in Nova Scotia (49%) and nationally (44%) (FNIGC, 2012). It is almost much lower than reported for Canadians in general (60%) and those living in the Atlantic (54% in New Brunswick, 58% in Nova Scotia, 58% in PEI and 60% in Newfoundland and Labrador (Statistics Canada 2013).

Figure 7. Overweight and obesity, Eel Ground First Nation compared to all First Nations in the Atlantic region\*



\*Classified using Health Canada's BMI categories; results include both measured and reported weight and height values; excludes pregnant and breastfeeding women

Figure 8. Rate of diabetes in Eel Ground First Nation compared to all First Nations in the Atlantic

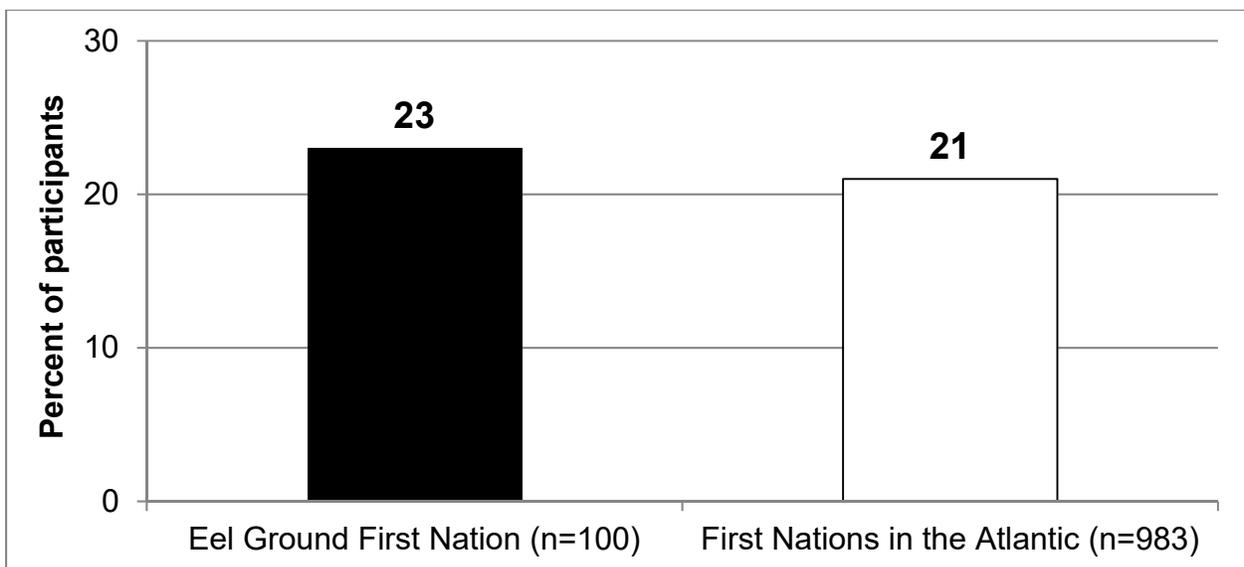


Figure 9. Type of diabetes for those reporting to have diabetes

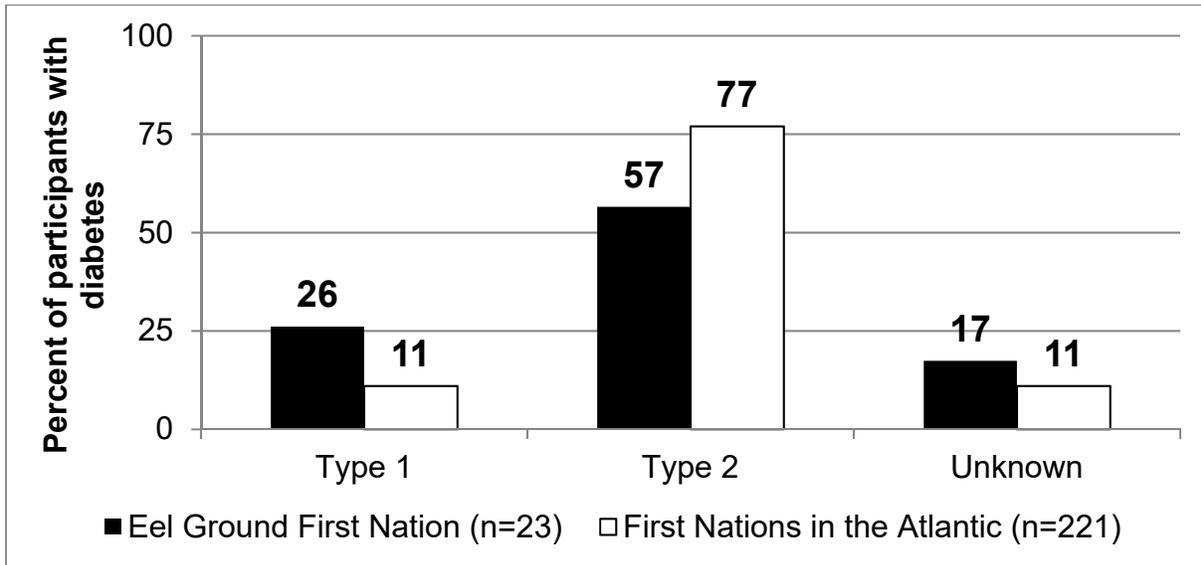


Figure 10. Percent of participants dieting (to lose weight) on the day before the interview, Eel Ground First Nation compared to all First Nations in the Atlantic

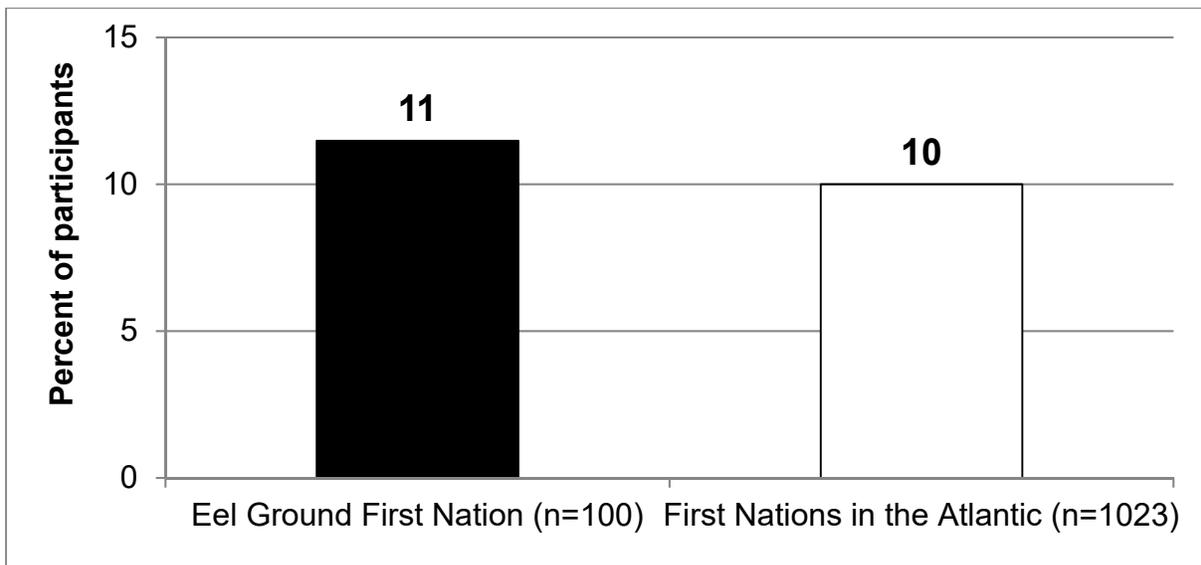


Figure 11. Percent of participants who smoke in Eel Ground First Nation compared to all First Nations in the Atlantic region

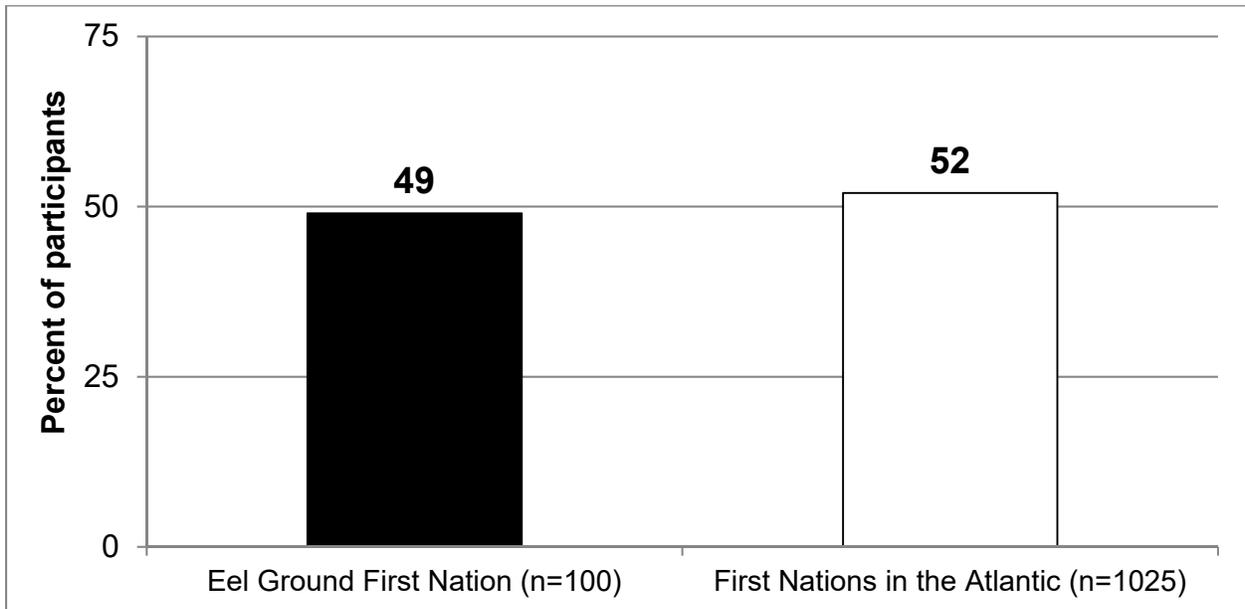


Figure 12. Self-reported activity level, Eel Ground First Nation compared to all First Nations in the Atlantic region

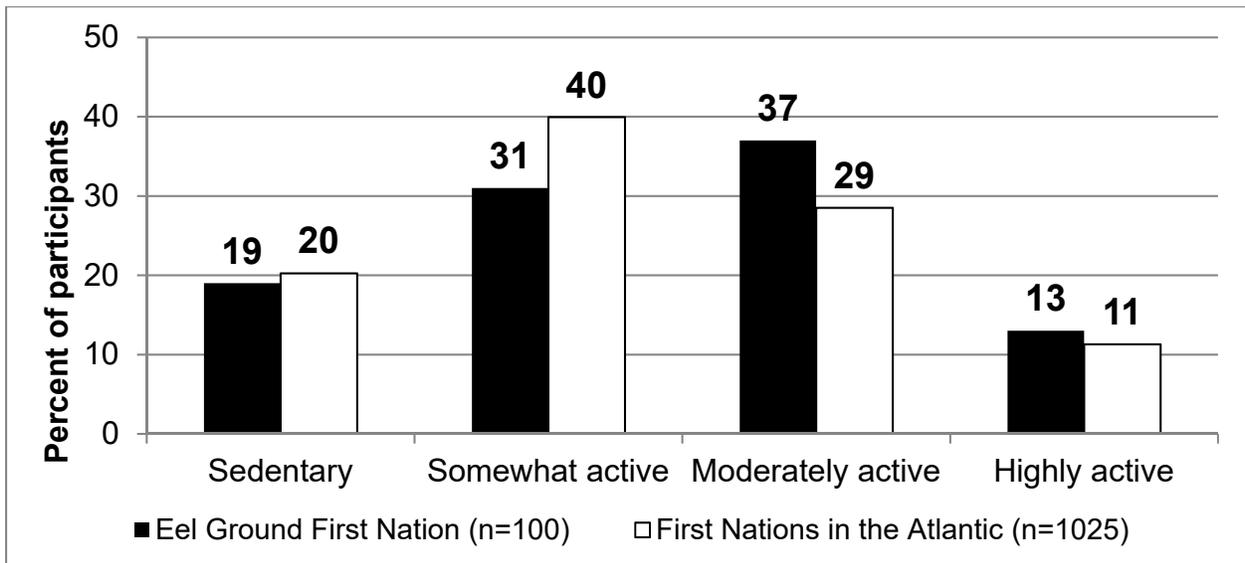
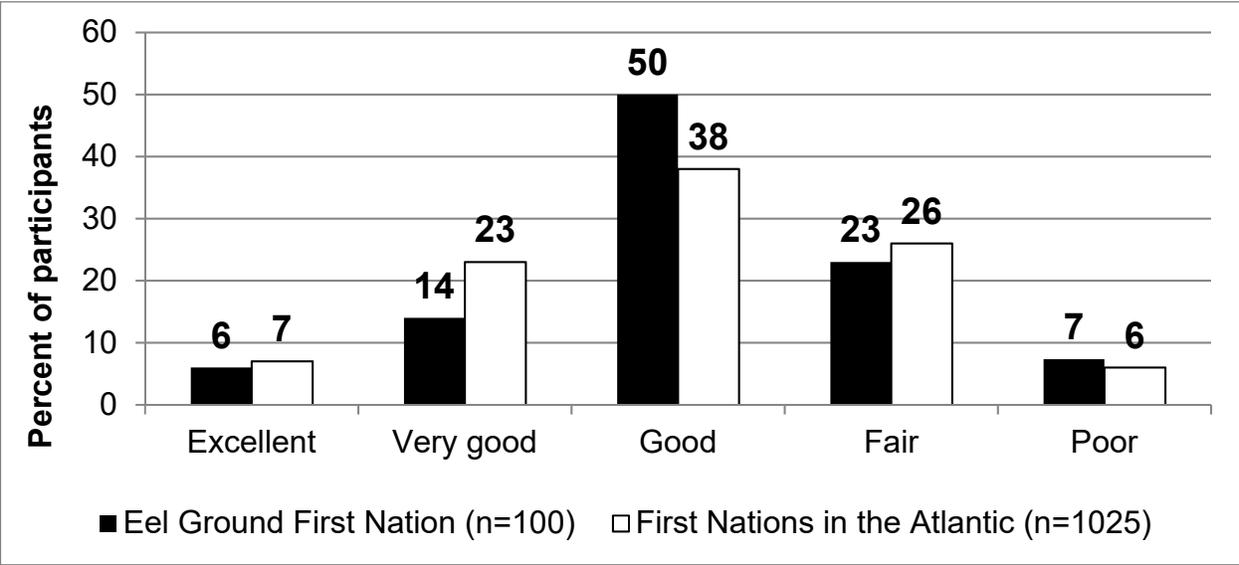


Figure 13. Self-perceived health, Eel Ground First Nation compared to all First Nations in the Atlantic region



#### **d) Food Security**

Many households in Eel Ground First Nation struggle to feed their families (Table 5). In 2014, 43% of participants worried that their food would run out before they could buy more, 35% reported that food purchased did not last, and 38% reported that they could not afford to eat balanced meals. Moreover, more than half of all families with children (62%) had to rely on less expensive food to feed their children and 2 out of 10 households with children reported that their children were not eating enough because they could not afford enough food.

Based on the answers to the questions in Table 5, 60% of households are food secure, meaning that they do not have difficulty purchasing enough food (Figure 14). However, 40% of households in your community struggle to put food on the table: 27% of the families are *moderately* food insecure meaning that they may need to purchase smaller amounts of some food and/or choose lower quality foods; and 13% have *severe* food insecurity, meaning that they are likely to regularly experience food shortages. More households with children were food insecure (57%) (Figure 15) compared to households without children (29%) in your community (Figure 16).

Food insecurity in your community (40%) was higher than found for all First Nations in the Atlantic. Overall, 31% of households on-reserve in the Atlantic are classified as food insecure (22% moderately food insecure and 9% severely food insecure). In stark contrast, 8% of Canadian households and 20% of Aboriginal households off-reserve were food insecure in 2014, although data from a few regions (British Columbia, Manitoba, Newfoundland and Labrador and the Yukon) were not available as they had opted out of the food security module (Tarasuk, Mitchell and Dachner 2016). In 2011/2012, when all regions participated in measuring household food security, the national food insecurity rate was 8% among all households and 23% among Aboriginal households off reserve. At the provincial level, household food insecurity was estimated at 11% in New Brunswick, 10% in Nova Scotia and 10% in Prince Edward Island.

The cost of food relative to income is a contributing factor to high food insecurity. In each participating community, a Nutrition Research Coordinator (NRC) asked permission from one local grocery store manager to undertake food costing using Health Canada's 2008 National Nutritious Food Basket Tool (NNFB) (Health Canada, 2009). The food basket contains 67 basic food items that require preparation (see Appendix C). Pre-packaged foods such as canned soup, frozen pizza, lasagna, burgers,

battered chicken, battered fish, coffee, tea, carbonated beverages, fruit flavoured drinks, as well as spices and condiments are not included. Non-food items such as household supplies or personal care items are not included. For comparison, costing was also undertaken in the cities of Moncton, Halifax and Gander. The total costs of these items were used to calculate the weekly costs of a healthy food basket for a family of four consisting of two adults (aged 31-50 years) and two children (one male teenager aged 14-18 and one female child aged 4-8). The cost of transportation is not included in the food basket pricing.

The estimated minimal weekly cost of feeding healthy meals to a family of four was found to be \$227 which was slightly more than the cost of groceries in Moncton (\$213) and across the Atlantic region (\$221) (Figure 17). The current food and beverage pattern of First Nations adults in the Atlantic (see Table 11, 12 and 14 in Section F) includes many items not found in the NNFB list. As such, food costing using the NNFB tool may differ from actual household spending on food.

Table 5. Percent of participants who responded affirmatively to food security questions (in the last 12 months) in Eel Ground First Nation

	Percent of participants who answered "yes" to the food security questions		
	All Households (n=100)	Households with children (n=39)	Households without children (n=61)
<b>Adult Food Security Questions</b>			
You and other household members worried food would run out before you got money to buy more	43	56	34
Food you and other household members bought didn't last and there wasn't any money to get more	35	46	28
You and other household members couldn't afford to eat balanced meals	38	54	28
You or other adults in your household ever cut the size of meals or skipped meals	16	28	8
You or other adults in your household ever cut the size of meals or skipped meals in 3 or more months	15	26	8
You (personally) ever ate less than you felt you should	19	26	15
You (personally) were ever hungry but did not eat	13	21	8
You (personally) lost weight	5	8	3
You or other adults in your household ever did not eat for a whole day	7	13	3
You or other adults in your household ever did not eat for a whole day in 3 or more months	4	5	3
<b>Child Food Security Questions</b>			
You or other adults in your household relied on less expensive foods to feed children	24	62	-
You or other adults in your household couldn't feed children a balanced meal	15	38	-
Children were not eating enough because you and other adults in your household just couldn't afford enough food	7	18	-
You or other adults in your household ever cut the size of any of the children's meals	2	5	-
Any of the children were ever hungry but you just couldn't afford more food	2	5	-
Any of the children ever skipped meals	2	5	-
Any of the children ever skipped meals in 3 or more months	2	5	-
Any of the children ever did not eat for a whole day	1	3	-

(-) not applicable

Figure 14. Degree of food insecurity in all Eel Ground First Nation households compared to results for all First Nations in the Atlantic

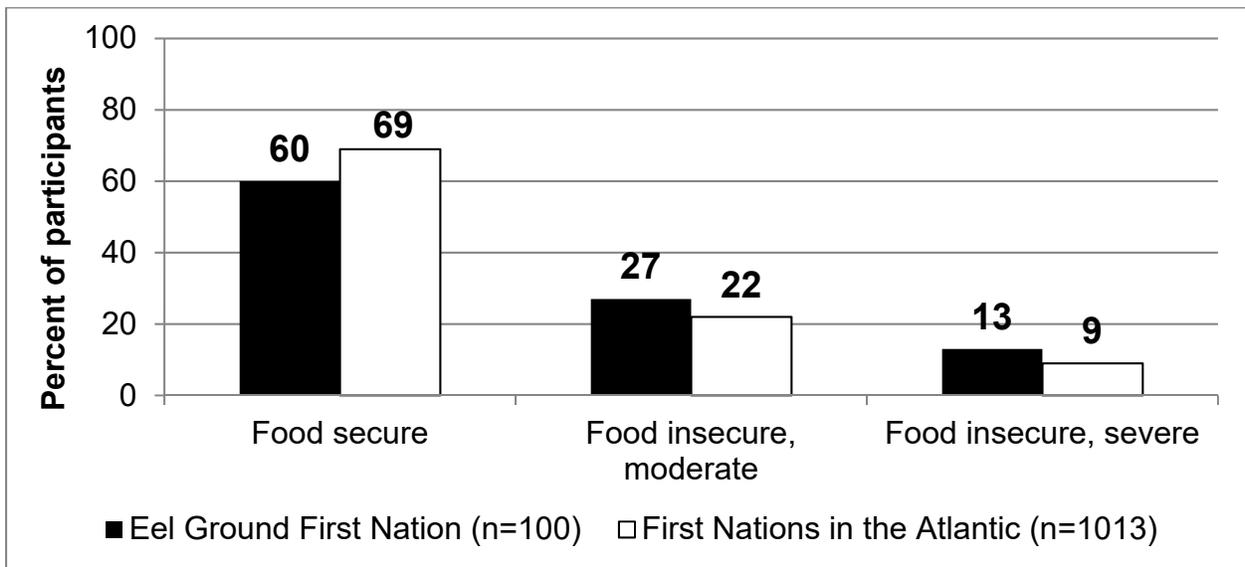


Figure 15. Degree of food insecurity in households with children, Eel Ground First Nation compared to all First Nations in the Atlantic

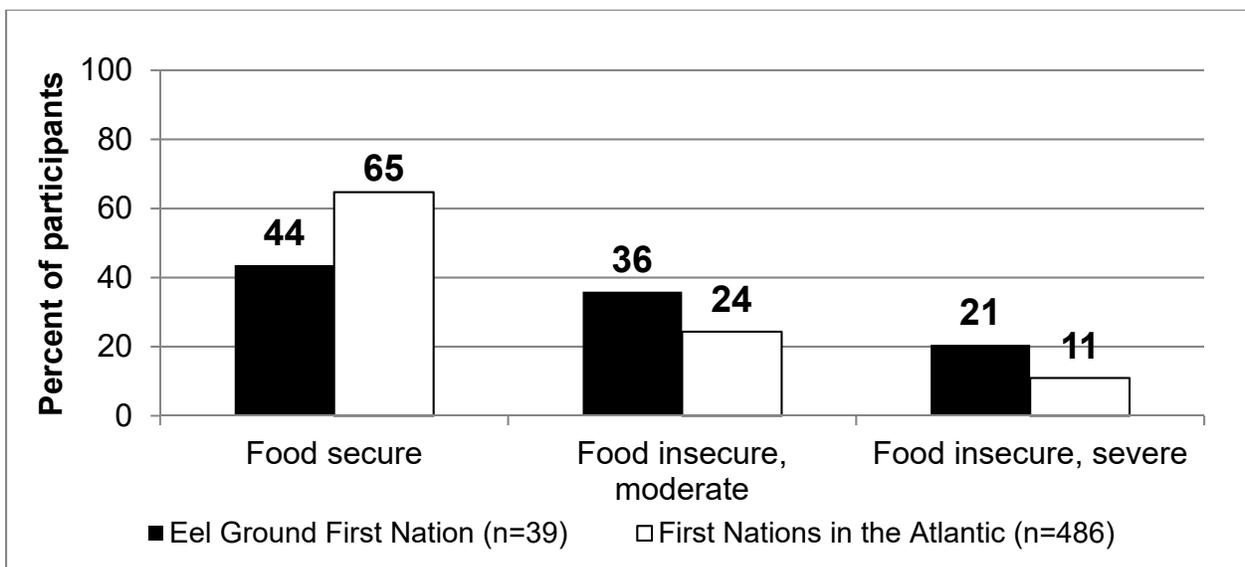


Figure 16. Degree of food insecurity in households without children, Eel Ground First Nation compared to all First Nations in the Atlantic

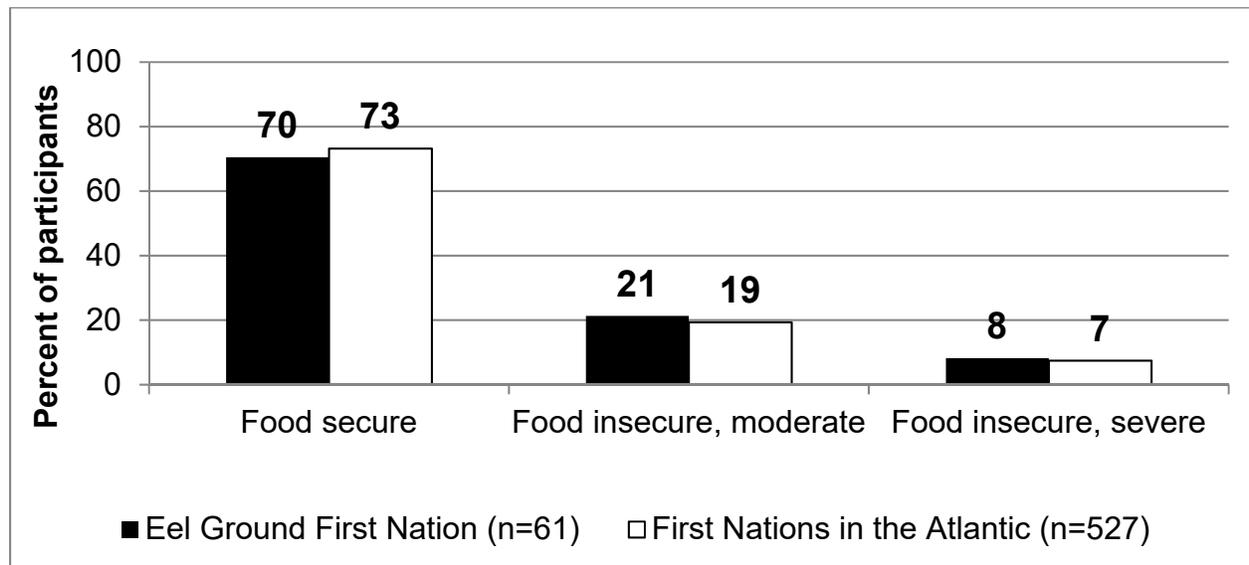


Figure 17. Estimated weekly cost of a healthy food basket for a family of four\*, Eel Ground First Nation compared to the Atlantic region



\*A family of four was defined as two adults (1 male, 1 female) aged 31-50, one male teenager aged 14-18, and one female child aged 4-8 years old. Costing for Eel Ground was done in Miramichi.

\*\* Food prices are averaged from cost of groceries in participating communities.

## **e) Traditional Food Use and Gardening**

In the Atlantic, traditional food harvesting (hunting, fishing, and gathering of wild plants) is an important part of the traditional food systems and food security of First Nations communities. Participating community members described how often they had eaten each of the 155 traditional food items listed on the survey in the last 12 months. Participants also shared information about their participation in traditional food harvesting and gardening practices along with their perceptions about the adequacy of their current traditional food supply. Together, this information demonstrates the value of community food activities to the health of First Nations.

First Nations in the Atlantic reported eating a variety of traditional foods over the past 12 months and the types varied across communities. In Table 6, traditional foods are grouped into the following categories: Fish, Land Mammals, Birds, Berries, Wild Plants (Greens, Roots, and Shoots), Tree Products, and Mushrooms. The list of traditional foods consumed by Eel Ground First Nation adults is compared against the total for First Nations in the Atlantic and listed in descending percentage of consumption.

In Eel Ground First Nation, 93% of all adults reported eating traditional food in the last year: Atlantic salmon, lobster, moose meat and blueberries were

eaten at least once in the last year by most adults in your community. Seventy-seven percent of the adults surveyed consumed fish (mainly Atlantic salmon, smelt and trout), 63% reported eating seafood (lobster and scallops), 63% ate land mammals (mainly moose) and 13% reported eating wild birds (mainly grouse). Seventy percent of adults reported eating wild berries (mainly blueberries and strawberries), 43% used wild plant foods (mainly fiddleheads), and 25% reported consumption of tree-based foods (mainly maple syrup). In Eel Ground First Nation, the percentage of adults who reported eating fish, seafood, game, wild berries, greens, tree foods and cultivated plants was higher compared to all First Nations in the Atlantic.

A summary of when and how often the top traditional foods in your community were consumed is listed in Table 7. Salmon, moose and lobster appear to be the most readily accessible and available traditional foods in your community. These foods are generally reported eaten one to two times in each season. A few households have these foods in their diet more frequently: some reported having game and lobster weekly.

The amount of each of the traditional foods eaten on a daily basis was calculated by multiplying the frequency of use of traditional food (Table 7) by the average portion sizes (Table 8) reported in the Atlantic. Portion sizes

were estimated based on data from consumers of each traditional food category as reported on the 24hr recalls for each gender (male and female) and age category (19-30, 31-50, 51-70 and 71+ years of age), by gender regardless of age category, or by total consumers. Due to the limited time frame of the 24hr recalls (intake recorded from just the fall season), the number of people who reported eating certain traditional foods was also limited. If there was very little or no consumption of a food category by any participant from the Atlantic region, mean portion sizes from previous FNFNES regions were used in the calculations instead, if these values were available. If no portion size data were available from either the current population or from previous FNFNES regions, portion sizes were taken from the literature.

The estimated average intake of major traditional foods in grams per person per day is presented in Table 9. On average, 16 grams (about 1 tablespoon) of traditional food per day were consumed by women and men in your community. Overall, all participants from First Nations in the Atlantic consumed an average of 21 grams a day or about half a cup a week.

More than half (58%) of the households in your community reported that they were directly involved in harvesting food (Figure 18). Twenty-four percent

reported hunting/setting snares, 42% said that they had fished, 28% collected wild plant foods and 13% collected seafood. Twenty-one percent of Eel Ground First Nation participants reported planting a garden, and 44% of participants said that they had eaten vegetables or fruits from a private or community garden (Figure 19). This indicates that gardens may be an important contributor to the intake of vegetables and fruits in Eel Ground First Nation. For the Atlantic region, 15% of all participants reported planting a garden and 36% reported eating vegetables from a private or community garden. The different kinds of garden vegetables and fruits reported to be eaten by all participants are listed in Appendix D.

About 3 out of 4 (76%) of Eel Ground First Nation participants would like to eat more traditional foods (Figure 20). However, similarly to concerns about store-bought food running out, more than 1 out of 3 households (39%) worried that their own traditional food supply would run out before they could get more (Figure 21), while 17% worried that it would not last and they could not get more (Figure 22).

On an open-ended question, 52% of all households in the Atlantic reported that there were barriers to using more traditional food. In your community, 68% of households reported barriers to increased use of traditional food. The

major barriers identified were: lack of a harvester, lack of knowledge, lack of time, access and health issues (Figure 23). Across the Atlantic, participants also identified that in addition to a lack of time available for harvesting, the lack of a hunter in the household and/or knowledge, equipment and transportation, and availability were major barriers to increased traditional food use (Figure 24). Additionally, when asked from a list of possible factors previously identified in First Nation communities as affecting or limiting access to traditional food harvesting, participants stated that government restrictions, industry (forestry and pulp mills, hydro, farming, mining) along with roadways and recreation activities (boaters, ATVs, snowmobiles) were major barriers (Figure 25).

When asked what the most important benefits of traditional foods were, the top 3 responses from your community were: healthy, natural and inexpensive (Figure 26), which were similar to the top responses given by all First Nations in the Atlantic (Figure 27). For store-bought food, the most important benefits reported by your community were their availability, variety and cost (Figure 28), which were similar for all First Nations in the Atlantic (Figure 29).

Table 6. Percent of on-reserve First Nations in the Atlantic consuming traditional foods in the past year, Eel Ground First Nation compared to all First Nations in the Atlantic (listed in descending order, by category)

TRADITIONAL FOOD	Eel Ground First Nation (n=100)	First Nations in the Atlantic (n=1025)
	Percent consumption	
<b>FISH</b>	77	56
Atlantic salmon	68	39
Smelt (American/rainbow)	35	20
Trout (all combined)	32	27
Haddock	27	18
Cod	23	17
Brook trout (speckle)	22	16
Striped bass	19	11
Rainbow trout	14	12
Lake trout	9	7
Halibut	7	11
Mackerel	6	13
Bluefin tuna	6	2
Smallmouth bass	4	2
American plaice (sole)	4	1
Brown trout	3	6
Shad	3	1
Herring	3	5
Flounder	3	2
Lake whitefish	2	0
American eel	2	10
Pollock	2	1
Gaspereau (alewife)	1	1
White perch/bass	1	1
Yellow perch	1	0
Ocean perch	1	0
<b>SEAFOOD</b>	63	53
Lobster	60	48
Scallops	28	24

TRADITIONAL FOOD	Eel Ground First Nation (n=100)	First Nations in the Atlantic (n=1025)
	Percent consumption	
Shrimp	26	14
Mussels	24	16
Crab (snow, rock, Jonah, green)	22	15
Soft clam	18	12
Quahog clam (surf clam)	14	7
Oysters	8	6
Squid	2	2
Razor clam	1	2
Other (octopus)	1	0
<b>LAND MAMMALS</b>	<b>63</b>	<b>54</b>
Moose meat	63	51
Deer meat	14	19
Hare meat	3	6
Moose liver	1	2
Black bear meat	1	2
<b>WILD BIRDS</b>	<b>13</b>	<b>10</b>
Grouse (spruce, ruffed)	8	8
Ducks (all combined)	2	1
Pheasant, ring-necked	2	1
Wood Duck	1	0
Mallard	1	0
Other wild bird (wild turkey)	1	0
<b>BERRIES AND NUTS</b>	<b>70</b>	<b>61</b>
Blueberry	59	48
Wild strawberry	53	39
Raspberry (wild)	43	31
Crabapple	20	13
Blackberry, large	18	24
Cherry (pin, sand, chokecherry)	10	5
Cranberry (low-bush/ bog)	8	8

TRADITIONAL FOOD	Eel Ground First Nation (n=100)	First Nations in the Atlantic (n=1025)
	Percent consumption	
Teaberry (wintergreen, checkerberry)	3	2
Highbush Cranberry (Nannyberry)	3	1
Plum	3	3
Dewberry	2	1
Gooseberry	2	5
Huckleberry	1	0
<b>WILD PLANTS</b>	<b>43</b>	<b>29</b>
Fiddleheads	36	26
Sweet flag (wihkes)	6	3
Wild rice	4	2
Lamb's quarters	2	0
Dandelions	2	1
Gold thread root tea	2	2
Cow parsnip	2	0
Wild mustard	1	0
Labrador Tea	1	1
Mint	1	4
Raspberry leaves	1	1
Wild turnip	1	0
Groundnut	1	0
Burdock	1	0
Iris	1	0
Sarsaparilla root	1	0
Other wild plants (sage tea)	1	1
<b>TREE FOODS</b>	<b>25</b>	<b>20</b>
Maple syrup	24	14
Hazelnuts	9	6
Cedar tea	3	2
Acorns	2	1
Beech nut	1	1
Butternut	1	1

TRADITIONAL FOOD	Eel Ground First Nation (n=100)	First Nations in the Atlantic (n=1025)
	Percent consumption	
Juniper tea	1	1
Tamarack bark tea	1	0
White pine needle tea	1	1
Spruce (black or white) bark tea	1	1
Witch hazel leaf/twig tea	1	0
<b>MUSHROOMS</b>	3	2
Chanterelle	2	1
<b>CULTIVATED TRADITIONAL FOOD</b>	55	23
Beans	36	18
Corn/hominy	39	16
Squash	9	9
Other cultivated TF (potatoes, celery, radish, tomatoes, cucumber, onions, peas)	6	3

Table 7. Seasonal frequency of top ten consumed traditional food items for consumers and non-consumers combined, Eel Ground First Nation (n=61)

Traditional Food	Percent of consumers	Average days per season (min, max)				Average days per year (min, max)
		Summer	Spring	Winter	Fall	
Atlantic salmon	68	2 (0, 10)	0.3 (0, 5)	0.3 (0, 5)	0.4 (0, 6)	3 (0, 22)
Moose meat	63	1 (0, 15)	1 (0, 15)	2 (0, 20)	2 (0, 15)	6 (0, 60)
Lobster	60	2 (0, 40)	0.4 (0, 10)	0.2 (0, 6)	0.2 (0, 5)	3 (0, 40)
Blueberry	59	2 (0, 30)	0 (0, 30)	1 (0, 30)	1 (0, 30)	5 (0, 120)
Wild strawberry	53	2 (0, 72)	1 (0, 72)	0 (0, 5)	0 (0, 5)	3 (0, 144)
Wild raspberry	43	1 (0, 8)	0 (0, 3)	0 (0, 5)	0 (0, 5)	2 (0, 12)
Beans	39	2 (0, 30)	1 (0, 30)	1 (0, 30)	1 (0, 30)	4 (0, 120)
Fiddleheads	36	1 (0, 20)	1 (0, 20)	0 (0, 5)	0 (0, 4)	2 (0, 40)
Corn/hominy	36	2 (0, 30)	1 (0, 30)	1 (0, 30)	1 (0, 30)	5 (0, 120)
Smelt	35	0 (0, 5)	0 (0, 2)	1 (0, 24)	0 (0, 2)	1 (0, 24)

Table 8. Mean daily portion sizes of traditional food categories, by gender and age group, based on 24hr recalls from First Nations in the Atlantic living on-reserve

Traditional food category	First Nations Women			First Nations Men		
	Age 19-50	Age 51-70	Age 71+	Age 19-50	Age 51-70	Age 71+
	Mean grams/serving			Mean grams/serving		
Fish <sup>a</sup>	123	123	123	123	123	123
Shellfish <sup>a</sup>	178	178	178	178	178	178
Land mammals meat <sup>b</sup>	149	160	150	260	177	224
Land mammals, organs <sup>c</sup>	105	105	105	105	105	105
Land mammal fat <sup>d</sup>	43	43	43	43	43	43
Wild birds <sup>a</sup>	25	25	25	25	25	25
Bird egg <sup>e</sup>	144	144	144	144	144	144
Wild berries <sup>a</sup>	23	23	23	23	23	23
Wild plants, roots, or greens <sup>f</sup>	54	102	41	67	69	79
Maple syrup <sup>a</sup>	41	41	41	41	41	41
Teas from plants and trees <sup>a</sup>	5	5	5	5	5	5
Mushrooms <sup>g</sup>	48	48	48	48	48	48

Note: only 6% of the 24 hour recalls contained traditional food. Therefore, portion sizes are based on the number of occasions of consumption in the sample.

<sup>a</sup>portion sizes calculated from values for all consumers due to the low number of observations

<sup>b</sup>portion sizes calculated by gender and age groups of consumers, with the exception of age 71+ which were based on values by gender due to low number of observations for this age group

<sup>c</sup>portion size calculated from values for all consumers using FNFNES data from BC, MB, ON, AB and AT due to low consumption

<sup>d</sup>none reported consumed on 24hr recalls therefore used portion size values from Chan et al, 2014.

<sup>e</sup>none reported consumed on 24hr recalls therefore used portion size from Canadian nutrient file values for one goose egg; Health Canada, 2010.

<sup>f</sup>portion size based on vegetable intake from 24hr recalls; calculated by gender and age groups of consumers

<sup>g</sup>none reported consumed on 24hr recalls therefore used portion size values from Chan et al, 2011.

Table 9. Estimated average intake of major traditional foods (g/person/day), based on traditional food frequency results, Eel Ground First Nation compared to all First Nations in the Atlantic (refer to Appendix E for conversion from grams to usual household measures)

Traditional Food	Eel Ground First Nation					First Nations in the Atlantic		
	Women (n=66)	Men (n=34)	All adults (n=100)			(n=1025)		
	mean	mean	mean	95th percentile	max	mean	95th percentile	max
<b>Total traditional food</b>	12.3	22.7	15.8	53.9	118.5	21.3	84.8	370.6
Moose meat	1.6	6.9	3.4	20.0	32.8	6.6	32.8	205.2
Lobster	1.1	1.3	1.2	4.6	19.5	1.6	7.3	46.8
Haddock	1.0	1.1	1.0	6.7	21.6	0.9	5.4	40.4
Corn/hominy	0.8	1.3	0.9	3.6	22.7	0.4	1.8	26.8
Atlantic salmon	0.9	0.8	0.9	3.7	7.4	0.8	2.7	40.4
Beans	1.0	0.5	0.8	3.0	33.5	0.4	2.3	42.6
Scallops	0.6	0.5	0.6	2.4	11.7	1.0	5.9	46.8
Shrimp	0.4	0.7	0.5	3.9	6.3	0.6	3.4	58.5
Cod	0.6	0.3	0.5	2.5	20.2	0.7	3.0	43.1
Fiddleheads	0.5	0.3	0.4	2.3	5.9	0.4	2.4	40.8
Smelt	0.3	0.5	0.4	1.4	8.1	0.5	2.7	40.4
Crab	0.3	0.4	0.4	2.0	11.7	0.5	2.0	58.5
Bluefin tuna	0.1	0.7	0.3	1.5	13.5	0.2	0	40.4
Quahog clam	0.2	0.6	0.3	0.7	17.6	0.2	0.5	23.4
Soft clam	0.2	0.6	0.3	2.4	6.8	0.3	1.5	23.4
Deer meat	0.1	0.7	0.3	2.7	7.8	1.1	5.7	142.5
Blueberry	0.4	0.2	0.3	1.0	7.6	0.4	1.5	18.2
Brook trout	0.3	0.3	0.3	1.9	6.7	0.4	2.0	40.4
Mussels	0.2	0.5	0.3	1.7	5.9	0.5	2.9	23.4
Wild strawberry	0.3	0.1	0.2	0.5	9.1	0.3	1.0	18.2

Traditional Food	Eel Ground First Nation					First Nations in the Atlantic		
	Women (n=66)	Men (n=34)	All adults (n=100)			(n=1025)		
	mean	mean	mean	95th percentile	max	mean	95th percentile	max
Striped bass	0.1	0.3	0.2	1.0	4.0	0.2	0.7	16.2
Maple syrup	0.1	0.3	0.2	1.2	2.3	0.2	1.2	17.5
Wild raspberry	0.1	0.1	0.1	0.6	0.8	0.2	0.6	18.2
Rainbow trout	0.1	0.1	0.1	0.7	2.7	0.3	1.4	21.2
Crabapple	0.1	0.1	0.1	0.4	3.8	0.1	0.3	18.2
Halibut	0.1	0.2	0.1	0.5	3.4	0.2	1.4	16.9
Hazelnuts	0.0	0.2	0.1	0.2	4.5	0.1	0.1	8.1
American plaice (sole)	0.1	0.1	0.1	0.0	4.0	0.1	0	24.3
Oysters	0.0	0.1	0.1	0.5	2.0	0.2	0.5	48.3
Lowbush cranberry	0.1	0.0	0.1	0.2	5.0	0.03	0.1	6.3
Squash	0.1	0.1	0.1	0.6	1.7	0.2	0.7	17.8
Razor clam	0	0.2	0.1	0	5.9	0.1	0	11.7
Mackerel	0.02	0.1	0.1	0.3	2.4	0.2	1.0	18.2
Blackberry	0.04	0.1	0.1	0.4	0.8	0.1	0.4	18.2
Lake trout	0.04	0.1	0.04	0.3	0.7	0.1	0.7	13.1
Brown trout	0.02	0.1	0.04	0	2.7	0.1	0.3	8.1
Shad	0.01	0.1	0.04	0	3.7	0.01	0	10.1
Flounder	0.03	0.1	0.04	0	2.0	0.03	0	8.1
Moose liver	0	0.1	0.04	0	3.7	0.04	0	13.8
Hare meat	0.01	0.1	0.04	0	2.1	0.1	0.4	42.7
Wild rice	0.03	0.02	0.03	0	1.2	0.04	0	11.2
Groundnut	0.04	0	0.03	0	2.8	0	0	2.8
Gaspereau	0.03	0	0.02	0	1.7	0.01	0	2.0
Smallmouth bass	0.02	0.01	0.02	0	0.7	0.01	0	2.0
Squid	0	0.07	0.02	0	2.0	0.05	0	11.7

Traditional Food	Eel Ground First Nation					First Nations in the Atlantic		
	Women (n=66)	Men (n=34)	All adults (n=100)			(n=1025)		
	mean	mean	mean	95th percentile	max	mean	95th percentile	max
Highbush cranberry	0.01	0.02	0.02	0	0.8	0.01	0	6.1
Herring	0.01	0.02	0.01	0	0.3	0.07	0	16.2
Lake whitefish	0.01	0.01	0.01	0	0.3	0	0	1.4
White perch/bass	0.01	0	0.01	0	0.7	0.02	0	4.0
American eel	0.02	0	0.01	0	0.7	0.2	1.0	16.2
Pollock	0.01	0.01	0.01	0	0.3	0.05	0	16.2
Black bear meat	0	0.02	0.01	0	0.7	0.05	0	19.6
Grouse	0.01	0.02	0.01	0.07	0.3	0.02	0.07	1.8
Teaberry	0	0.03	0.01	0	0.8	0.01	0	2.3
Cherry	0.01	0.03	0.01	0.13	0.3	0.02	0.06	4.5
Lamb's quarters	0	0.02	0.01	0	0.6	0	0	0.6
Wild mustard	0	0.02	0.01	0	0.8	0	0	0.8
Wild turnip	0	0.02	0.01	0	0.7	0	0	2.2
Chanterelle mushroom	0.01	0.01	0.01	0	0.4	0.01	0	2.1
Yellow perch	0.01	0	0	0	0.3	0	0	0.7
Ocean perch	0.01	0	0	0	0.3	0	0	3.4
Gooseberry	0	0.01	0	0	0.3	0.03	0	13.6
Plum	0	0.01	0	0	0.3	0.01	0	7.6
Acorns	0.01	0	0	0	0.2	0	0	2.7

Note: this list excludes foods that were not reported to be consumed by any participant from Eel Ground First Nation

Figure 18. Traditional food harvesting practices by households in Eel Ground First Nation compared to all First Nations in the Atlantic

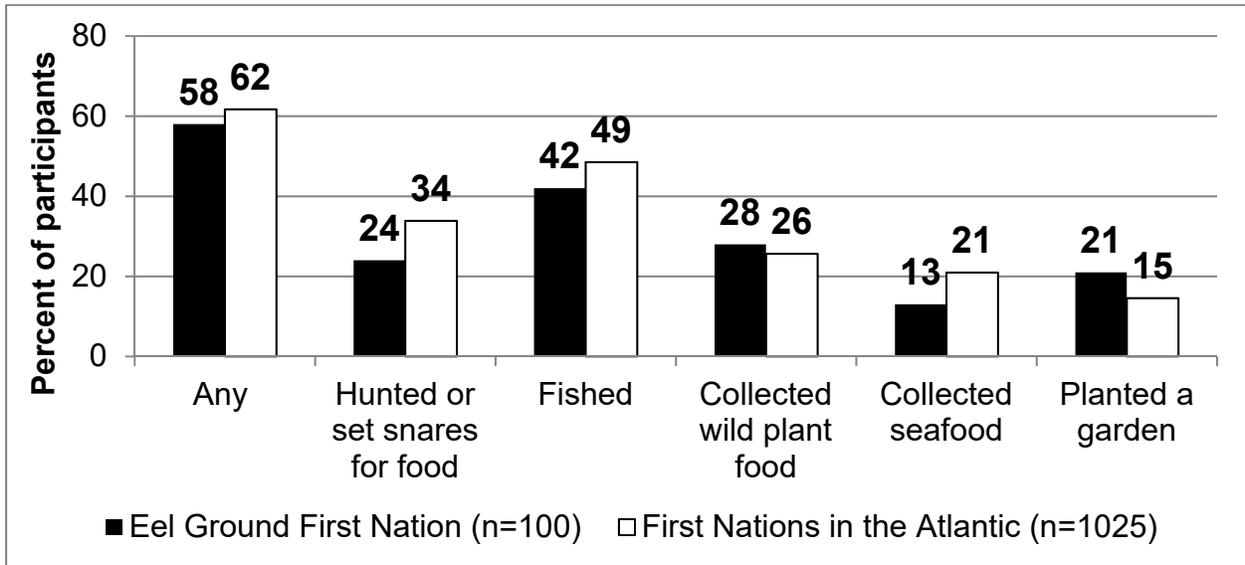


Figure 19. Percent of participants who ate vegetables and/or fruits from their garden or a community garden (on-reserve), Eel Ground First Nation compared to all First Nations in the Atlantic



- ➔ 44% Eel Ground First Nation (n=100)
- ➔ 36% First Nations in the Atlantic (n=1025)

Figure 20. Percent of participants whose households would like more traditional food, Eel Ground First Nation compared to all First Nations in the Atlantic



- ➔ 76% Eel Ground First Nation (n=100)
- ➔ 60% First Nations in the Atlantic (n=1025)

Figure 21. Percent of participants who, in the past 12 months, worried that their traditional food would run out before they could get more

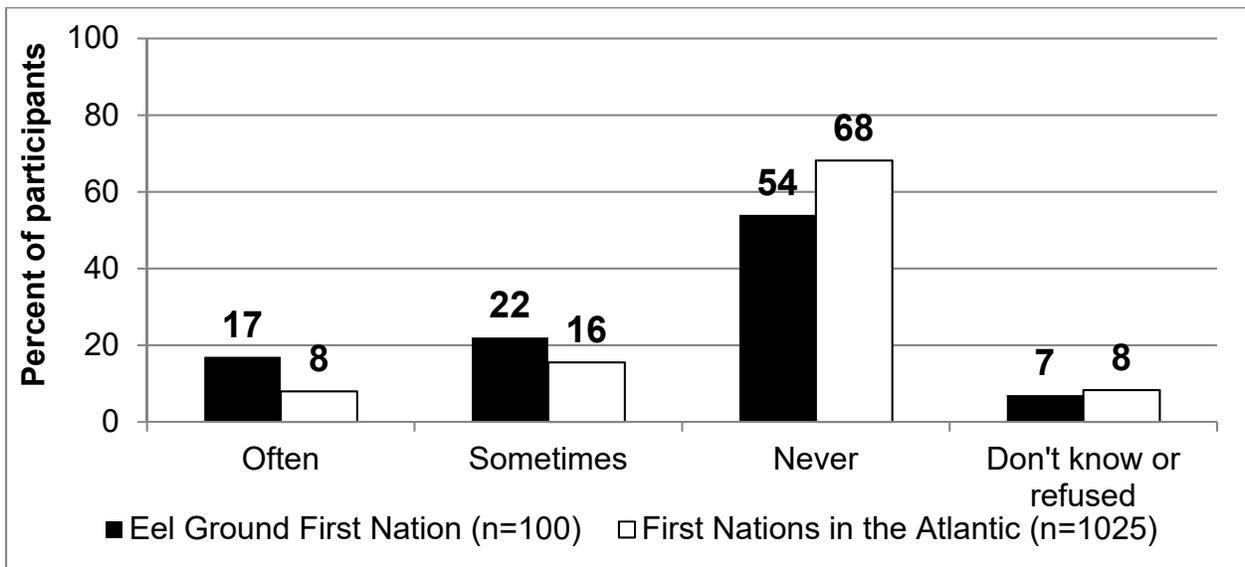


Figure 22. Percent of participants who, in the past 12 months, worried that their traditional food just didn't last and they couldn't get more

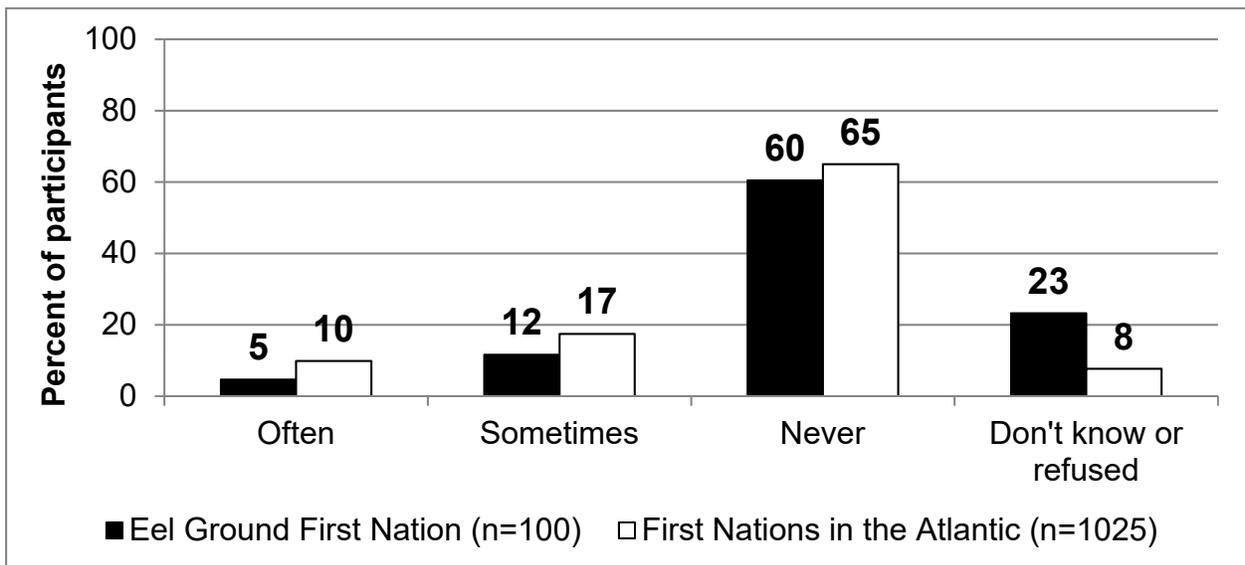


Figure 23. Top 5 barriers preventing Eel Ground First Nation households from using more traditional food

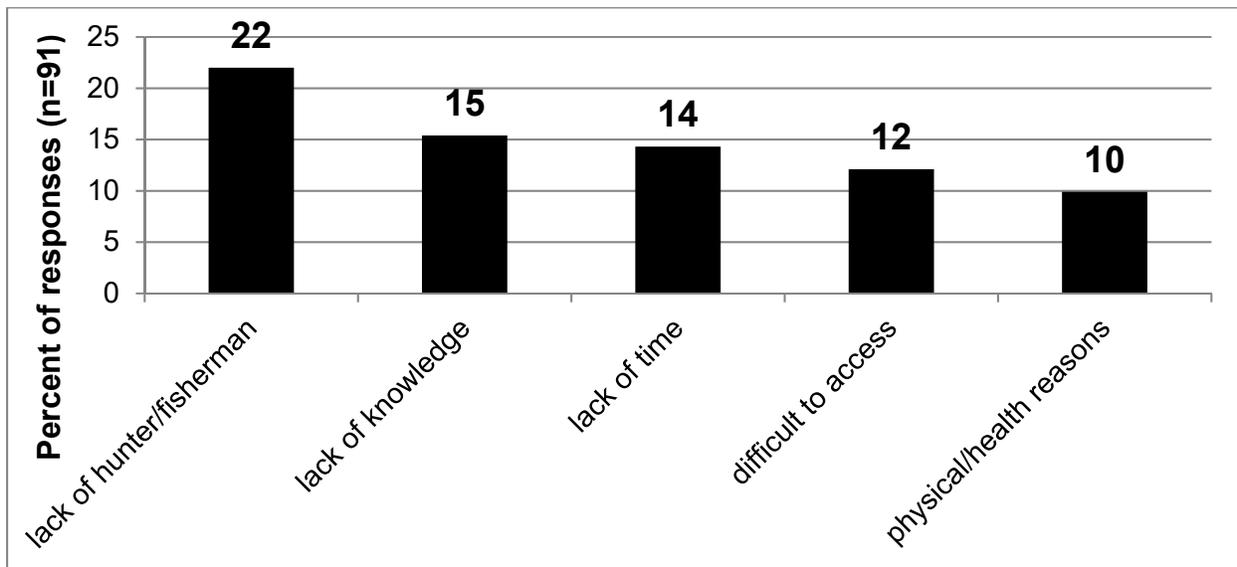


Figure 24. Top 5 barriers preventing First Nations across the Atlantic from using more traditional food

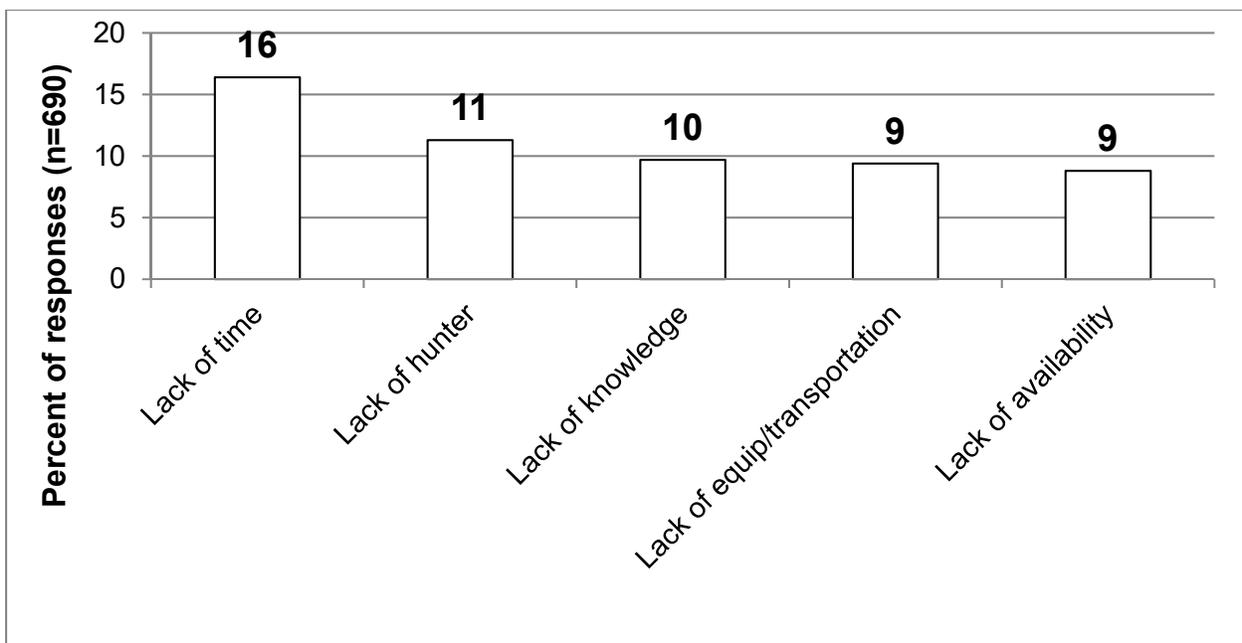


Figure 25. Percent of Eel Ground First Nation participants who reported that the following affected (or limited) where they could hunt, fish or collect berries, compared to all First Nations in the Atlantic

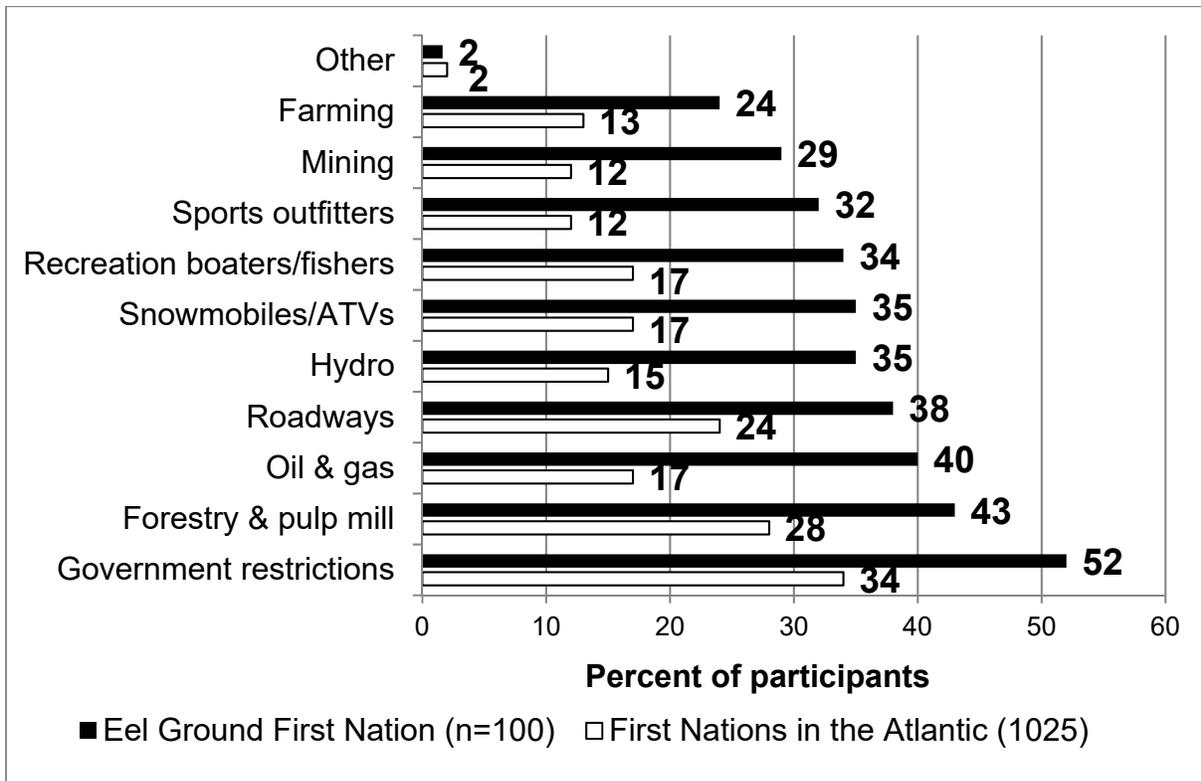


Figure 26. Top 5 benefits of traditional food in Eel Ground First Nation

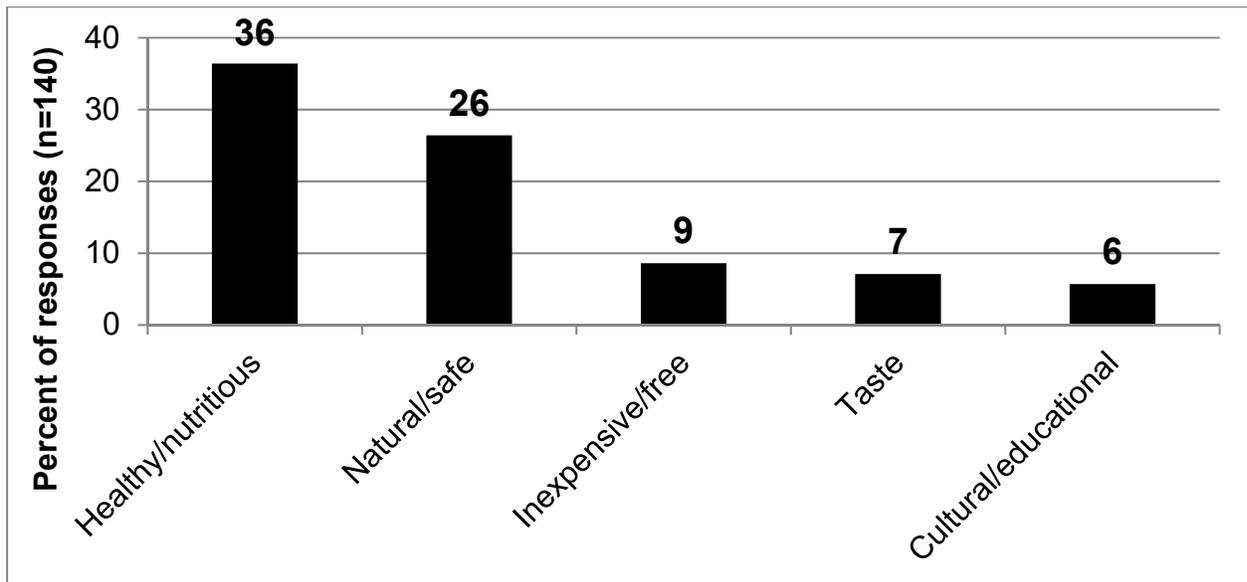


Figure 27. Top 5 benefits of traditional food for First Nations in the Atlantic

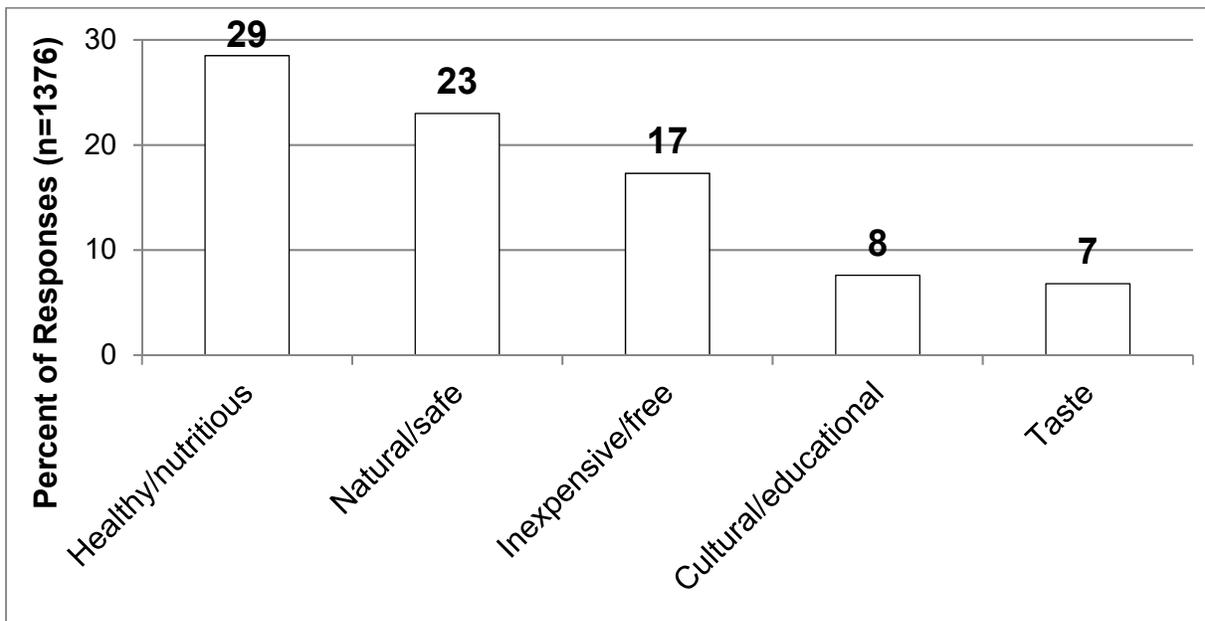


Figure 28. Top 5 benefits of store-bought food in Eel Ground First Nation

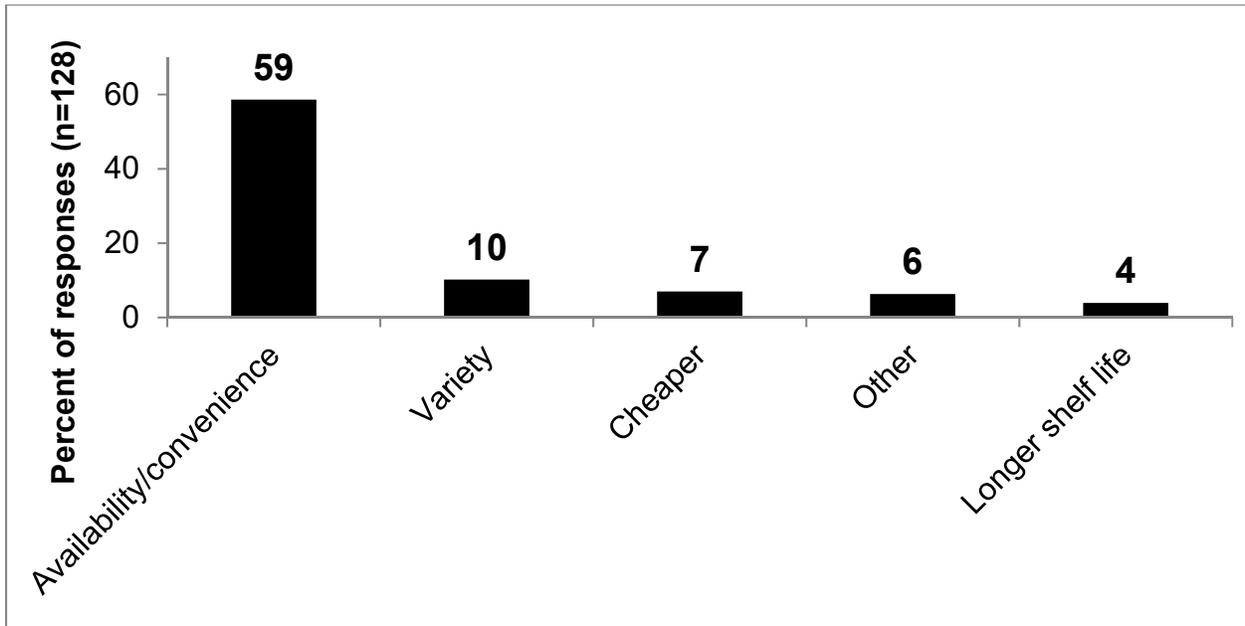
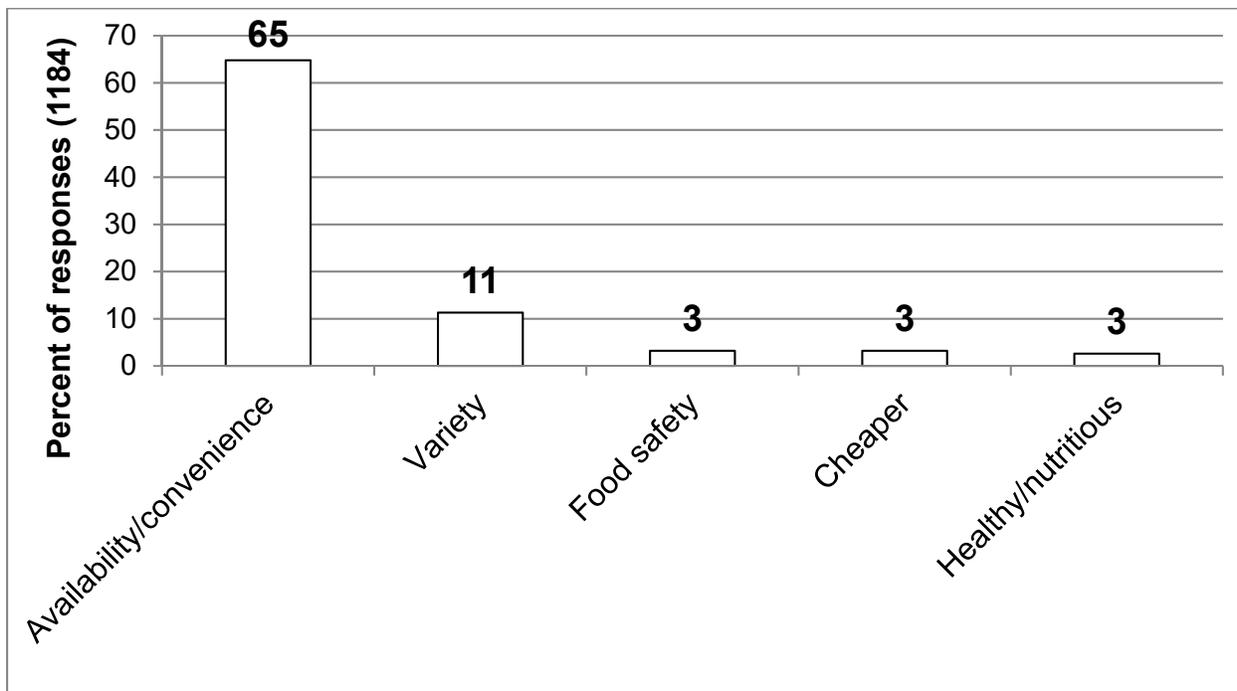


Figure 29. Top 5 benefits of store-bought food for First Nations in the Atlantic



Note: verbatim comments to this open-ended question were grouped according to similar categories.

## **f) Nutrient Intake**

In order to understand how well First Nations in the Atlantic are eating, each participant was asked to describe the types and amounts of food and beverages they consumed within a one-day period (24 hours). This information was analyzed and compared to healthy eating guidelines to describe the diet quality of First Nations in the Atlantic. The nutrients consumed from the foods were compared to recommendations to describe the adequacy of nutrient intake. Given the limited number of surveys at the community level, a statement about diet quality and nutrient adequacy can only be made at the Atlantic region level.

*Eating Well with Canada's Food Guide - First Nations, Inuit and Métis* (Health Canada, 2007) describes the amount and types of food needed on a daily basis to supply the nutrients needed for good health and to lower the risk of obesity, Type 2 diabetes, heart disease, some cancers, and osteoporosis. There are four food groups in Canada's Food Guide (CFG-FNIM): Vegetables and Fruit, Grain Products, Milk and Alternatives, and Meat and Alternatives. A copy of Canada's Food Guide is in Appendix F and is available online at Health Canada's website (<http://www.hc-sc.gc.ca/fn-an/pubs/fnim-pnim/index-eng.php#>).

When compared to CFG-FNIM, First Nations in the Atlantic are not meeting the recommendations for healthy eating (Table 10). First Nations adults in the Atlantic meet the recommended number of servings from the Meat and Alternatives group but fall below the recommended intake for the other three food groups (Milk and Alternatives, Vegetables and Fruit, and Grain Products). One in three (34%) First Nations participants reported that they avoided specific food or beverages because of intolerance: dairy products, greasy food and spices were the most commonly avoided foods (see Appendix G). The following describes the eating patterns of First Nations in the Atlantic compared to the guidelines in more detail:

***Vegetables and Fruit group:*** CFG-FNIM recommends that adult males have 7-10 Food Guide servings daily while females have 7-8 Food Guide servings of vegetables and fruit per day (one Food Guide serving is equivalent to ½ cup (4 ounces) of a fresh, frozen or canned vegetable, berries, fruit or 100% fruit juice or 1 cup (8 ounces) of raw leafy greens). Adults from First Nations in the Atlantic consumed below the minimum recommended amounts (3 servings per day). A large portion of the vegetable servings came from potatoes, which are not as rich in vitamins and minerals as leafy green and orange vegetables. Not eating the recommended amount of fruits and vegetables on a regular basis can lead

to low intakes of several nutrients, including fibre, vitamin A, vitamin C, magnesium and folate. These nutrients are important for several functions within the body, including: maintaining healthy skin (vitamins A and C); regulating blood pressure and bone mass (magnesium); producing healthy blood (folate and vitamin C); and reducing the risk of infection (vitamins A and C) and some cancers (fibre).

**Grain Products:** CFG-FNIM recommends that adult males have 7-8 Food Guide servings a day, while females have 6-7 Food Guide servings of grain products per day; half of these servings should be whole grain foods. Examples of a Food Guide serving from the Grain Products include 1 slice of bread, a 2" x 2" x 1" piece of bannock, ½ a bagel or pita, or tortilla, and ½ cup of cooked rice. Whole grain foods, such as whole wheat bread, brown rice, wild rice, barley and oats, are a good source of fibre and have many health benefits. Foods high in fibre can help us feel full longer, maintain a healthy body weight, as well as reduce the risk of heart disease, diabetes and cancer. Grain products are also an important source of several nutrients necessary for good health including riboflavin, thiamin, zinc, folate, iron, magnesium and niacin. First Nations men and women in the Atlantic fell short of the recommended number of servings from this group by 1 Food Guide serving a day.

***Milk and Alternatives group:*** CFG-FNIM recommends that adult males and females aged 19-50 consume 2 servings from this food group per day. Adults aged 51+ are recommended to have at least 3 Food Guide servings a day. Examples of a Food Guide serving from this group include: 1 cup of milk or fortified soy beverage,  $\frac{3}{4}$  cup of yogurt and 1  $\frac{1}{2}$  ounces of cheese. This food group contains the primary sources of calcium and vitamin D which are essential for building and maintaining healthy bones and teeth. In the Atlantic, both male and female participants reported having 1 serving per day. This may be explained, in part, by some dairy product intolerance (see Appendix G), as reported by 13% of total respondents (19% of females and 10% of men). This low intake poses a concern for adequacy for calcium and vitamin D.

***Meat and Alternatives group:*** CFG-FNIM recommends that adult men consume 3 Food Guide servings of food from the meat and alternates food group every day, while the recommendation for women is 2 servings per day. A Food Guide serving from the Meat and Alternatives Group is equivalent to 2 eggs or 2  $\frac{1}{2}$  ounces ( $\frac{1}{2}$  cup) of wild or store-bought meat, fish, poultry, shellfish, or  $\frac{3}{4}$  cup of cooked beans (lentils, black beans, split peas), or 2 tablespoons of peanut butter. In this study, men and women met the recommended number of servings per day. Consuming more than

the daily recommended amount of foods from the Meat and Alternatives group can contribute to a high fat intake and replace foods from other food groups which are consumed in low amounts.

Overall, the food choices of men and women are very similar. Within each of the four food groups, only a limited number of foods appear frequently (Table 11). The low consumption of whole grains, fresh berries and fruit, and the low consumption of fresh and frozen vegetables relative to the use of potatoes, is particularly problematic and points towards the need to find ways to increase their consumption to improve intake of fibre, vitamins and minerals but decrease sodium.

Whether or not nutrients were consumed in adequate, low, or high amounts was determined from nutrient content calculations for the food and beverages consumed by participants. The population's intake for each nutrient was compared against dietary intake recommendations (IOM, 2000).

Overall, in comparison to the Dietary Reference Intakes, First Nations in the Atlantic have:

- Adequate intakes for iron, vitamin B12, thiamin, riboflavin, niacin, zinc and phosphorous;
- High intakes of saturated fat;
- High intakes of sodium;
- Low intakes of fibre, vitamin A, vitamin D, calcium and magnesium;
- Low intakes of vitamin C for older women aged 51+ and men, as well as smokers; and
- Low intakes of folate and vitamin B6 among older women aged 51+

Detailed information on the daily intake of each nutrient by First Nations in the Atlantic region will be presented in the FNFNES Atlantic Regional Report to be released in 2017.

High (excess), as well as low (inadequate) nutrient intakes can have serious consequences on health. High intake of fat is linked to obesity and saturated fat is particularly associated with heart disease. High intake of sodium (salt) has been linked to high blood pressure, which can also lead to heart disease. People with diabetes are 2-3 times more likely to develop heart disease than those without. Reducing intake of foods high in fat and sodium are key steps to promoting better health.

Table 12 shows the foods that are the most important contributors to nutrients. As mentioned above, saturated fat and sodium intakes for all age

groups were above the recommended levels. The main sources of saturated fat in the diet were butter, beef, cream, pizza, cheese and processed meats. The main source of salt came from bread, pizza, and sandwiches.

Increasing consumption of vegetables and fruit would help increase intakes of vitamin A, vitamin C and fibre and could help to lower salt and fat in the diet overall. Increasing intake of foods such as: fish, milk, and milk products (such as vitamin D fortified yogurt); calcium and vitamin D fortified beverages (such as soy beverages); bannock (made with baking powder that contains calcium) and dark green vegetables and wild plants (calcium rich sources) would increase intakes of vitamin D and calcium. Finally, eating more whole grain products such as whole grain breads, cereals, and pasta would increase intakes of folate and fibre.

Table 12 also shows that traditional foods are important sources of nutrient intake as they were major contributors to protein, vitamin D, iron and zinc, which are required for strong bones (vitamin D), proper growth, healthy blood and maintenance of muscles. The important contribution of traditional food to nutrient intake is further illustrated in Table 13, where highlighted nutrients are those that were significantly higher on days with traditional food and underlined nutrients are those that were significantly higher on days with just

store-bought food. Even though the average intake of traditional food for all First Nations in the Atlantic was 21 grams (and 16 grams in your community), on days when traditional food was eaten, intakes of many nutrients were significantly higher than on days when only store-bought food was eaten. This indicates that the diet is healthier when traditional food is included.

Table 14 shows the average quantities of the main store-bought foods consumed for First Nations in the Atlantic overall and Eel Ground First Nation participants. Pasta was the store-bought food consumed in the largest amounts in Eel Ground First Nation as well for all First Nations participants in the Atlantic. In Eel Ground First Nation, water (tap and bottled combined) was the most popular beverage (average intake about 1  $\frac{3}{4}$  cups per day), followed by coffee. Just over 1 cup (257 ml) of carbonated drinks (soft drinks) and fruit-flavoured drinks are consumed on a daily basis: across the Atlantic, participants consumed approximately 1  $\frac{1}{3}$  cups (362 ml) of sugar-sweetened beverages daily. It should be noted that sugar-sweetened beverages such as soft drinks, fruit-flavoured drinks, lemonade, sweetened iced tea, sports drinks, and energy drinks can increase the risk of being overweight, thereby increasing the risk of diabetes and heart disease (Hu et al, 2010). Drinking water instead would be a healthier alternative.

In Eel Ground First Nation, 30% of participants took nutrient supplements compared to 1 out of 5 (20%) of all participants in the Atlantic region (Figure 30). Overall, the most commonly reported supplement was a multivitamin supplement taken by 26% of all participants, followed by vitamin D (12%) and B vitamins (10%) (Appendix H). Nutrient supplements can help individuals meet their nutrient needs when the diet quality is low. For example, the need for vitamin D increases over the age of 50. As such, Health Canada recommends that men and women over 50 take a vitamin D supplement of 10 µg (400 IU) per day (Health Canada, 2007).

Table 10. Average number of food guide servings consumed per day by First Nations men (n=355) and women (n=624) in the Atlantic compared to Canada's Food Guide (CGF) recommendations (unweighted)

Food Group	Gender	First Nations in the Atlantic current intake	Canada's Food Guide Recommendations
		Servings per day	
Vegetables & Fruits	men	3	7-10
	women	3	7-8
Grain Products	men	6	7-8
	women	5	6-7
Milk & Alternatives	men	1	2-3
	women	1	2-3
Meat & Alternatives	men	3	3
	women	2	2



Table 11. Top 5 contributors to Canada's Food Guide (% of total group intake), for First Nations women and men, living on-reserve in the Atlantic

Gender	Canada's Food Guide Food Groups							
	Vegetables and Fruit	(%)	Meat and Alternatives	(%)	Grain Products	(%)	Milk and Alternatives	(%)
Women	Potatoes	28	Chicken	23	White bread	33	Fluid milk	28
	Fresh/frozen vegetables	19	Beef	20	Pasta/noodles	16	Mixed dishes with cheese <sup>c</sup>	20
	Canned vegetables <sup>a</sup>	17	Pork	12	Cereal <sup>b</sup>	10	Cheese <sup>d</sup>	13
	Fruit/vegetable juices	12	Eggs	12	Whole wheat bread	9	Mashed potatoes with milk	7
	Fresh/frozen fruits	10	Fish/seafood	6	Rice	5	Coffee cream	5
Men	Potatoes	39	Beef	24	White bread	39	Fluid milk	30
	Fresh/frozen vegetables	16	Chicken	17	Pasta/noodles	17	Mixed dishes with cheese	28
	Canned vegetables	12	Pork	13	Cereal	10	Cheese	12
	Fruit/vegetable juices	10	Eggs	10	Whole wheat bread	7	Coffee cream	6
	Fresh/frozen fruits	9	Wild meats <sup>e</sup>	10	Rice	5	Mashed potatoes with milk	4

<sup>a</sup> includes canned vegetable soups

<sup>b</sup> includes both hot and cold cereal (approximately 50% of each for both women and men)

<sup>c</sup> includes macaroni and cheese, pizza and cheeseburgers

<sup>d</sup> includes cheddar, mozzarella, parmesan, Swiss, Monterey Jack, feta and Havarti

<sup>e</sup> includes moose, deer and rabbit. Wild meats contributed 3% of intake from the meat and alternatives group for women, while fish and seafood contributed 5% for men

Table 12. Ten most important food contributors to nutrients for First Nations living on-reserve in the Atlantic region

a) Energy		b) Protein		c) Fat		d) Carbohydrates	
FOOD	% of total	FOOD	% of total	FOOD	% of total	FOOD	% of total
Bread/buns, white	8.0	Chicken	10.4	Chicken	6.6	Bread/buns, white	11.8
Pasta/noodles	6.1	Beef	9.7	Beef	6.3	Carbonated drinks, regular	11.2
Carbonated drinks, regular	5.4	Pasta/noodles	6.3	Pizza	5.6	Pasta/noodles	8.6
Pizza	5.2	Bread/buns, white	5.9	Margarine	5.4	Jam/honey/syrup/sugar	5
Chicken <sup>a</sup>	4.6	Pork <sup>d</sup>	5.9	Cold cuts/sausages	5.3	Cereal	4.8
Beef <sup>b</sup>	3.9	Pizza	5.7	Salty snack food	5.1	Potatoes <sup>f</sup>	4.8
French fries/ hash browns	3.8	Sandwiches	5.2	French fries/ hash browns	4.8	Pizza	4.7
Sandwiches	3.8	Eggs	4.6	Sandwiches	4.8	French fries/ hash browns	4.2
Salty snack food <sup>c</sup>	3.4	Milk <sup>e</sup>	4.4	Eggs	4.6	Sandwiches	3.2
Cereal	2.9	Moose	4.2	Pork	4.3	Cakes/pies/pastries	3.1

e) Saturated Fat		f) Monounsaturated Fat		g) Polyunsaturated Fat		h) Cholesterol	
FOOD	% of total	FOOD	% of total	FOOD	% of total	FOOD	% of total
Butter	8	Beef	8	Salty snack food	11	Eggs	36
Beef	7	Chicken	7	Margarine	9	Chicken	10
Cream	7	Margarine	7	Chicken	8	Beef	7
Pizza	7	Cold cuts/sausages	7	Salad dressing/dips	7	Sandwiches	7
Cheese	6	Salty snack food	5	Bread/buns, white	6	Pork	5
Cold cuts/sausages	6	Pizza	5	French fries/ hash browns	6	Cream	3
Sandwiches	5	Eggs	5	Pizza	5	Cold cuts/sausages	3
Chicken	5	Pork	5	Nuts/seeds	5	Pizza	3
French fries/ hash browns	5	French fries/ hash browns	5	Eggs	4	Butter	3
Pork	4	Sandwiches	4	Sandwiches	4	Milk	3

Table 12. Ten most important food contributors to nutrients for First Nations living on-reserve in the Atlantic region

i) Total Sugars		j) Fibre		k) Vitamin A		l) Vitamin C	
FOOD	% of total	FOOD	% of total	FOOD	% of total	FOOD	% of total
Carbonated drinks, regular	29	Bread/buns, white	10	Vegetables	26	Fruit juice	27
Jam/honey/syrup/sugar	13	Vegetables	10	Milk	12	Fruit drink	21
Milk	7	Bread/buns, whole wheat	9	Eggs	12	Vegetables	14
Fruits	6	Cereal	9	Margarine	8	Fruits	9
Fruit juice	5	Pasta/noodles	7	Butter	5	Potatoes	7
Cakes/pies/pastries	4	French fries/ hash browns	6	Cream	5	French fries/ hash browns	5
Cereal	3	Potatoes	6	Pizza	4	Sandwiches	2
Bread/buns, white	3	Fruits	6	Cheese	4	Salty snack food	2
Pasta/noodles	3	Salty snack food	5	Potatoes	3	Condiments	2
Vegetables	3	Pizza	5	Sandwiches	2	Supplement (meal/protein)	1

m) Vitamin D		n) Folate		o) Calcium		p) Iron	
FOOD	% of total	FOOD	% of total	FOOD	% of total	FOOD	% of total
Milk	30	Bread/buns, white	23	Milk	18	Bread/buns, white	14
Margarine	20	Pasta/noodles	18	Bread/buns, white	11	Cereal	12
Eggs	14	Pizza	10	Pizza	8	Pasta/noodles	7
Fish	5	Vegetables	5	Cheese	8	Pizza	6
Pasta/noodles	5	Sandwiches	4	Sandwiches	5	Beef	5
Pork	4	Eggs	4	Pasta/noodles	4	Sandwiches	4
Cold cuts/sausages	3	Cereal	3	Cereal	3	Moose	3
Sandwiches	3	Fruit juice	3	Bread/buns, whole wheat	3	Chicken	3
Chicken	2	Tea	3	Vegetables	3	Hamburger/cheeseburger	3
Cream	2	Bread/buns, whole wheat	2	Cream	3	Vegetables	3

Table 12. Ten most important food contributors to nutrients for First Nations living on-reserve in the Atlantic region

q) Sodium		r) Zinc	
FOOD	% of total	FOOD	% of total
Bread/buns, white	11	Beef	16
Pizza	7	Moose	7
Sandwiches	7	Pasta/noodles	5
Soup	6	Pizza	5
Cold cuts/sausages	5	Chicken	5
Condiments	5	Milk	5
Pasta/noodles	4	Cereal	4
Pork	4	Pork	4
Chicken	4	Bread/buns, white	4
French fries/ hash browns	4	Hamburger/cheeseburger	4

<sup>a</sup>chicken= roasted, baked, fried and stewed

<sup>b</sup>beef= ground, steak, ribs and brisket

<sup>c</sup>salty snack food=potato chips, pretzels, popcorn

<sup>d</sup>pork= loin, chops and ribs

<sup>e</sup>milk =fluid, evaporated, powdered

<sup>f</sup>potatoes= boiled, baked, mashed

Table 13. Comparison of nutrient intake (mean  $\pm$  SE) on days with and without traditional food (TF), for on-reserve First Nations adults in the Atlantic

Nutrient	Days with TF (n=66 recalls)	Days without TF (n=959 recalls)
	mean $\pm$ SE	
Energy (kcal)	2000 $\pm$ 131	1845 $\pm$ 32
<b>Protein</b> (g)	123 $\pm$ 10	72 $\pm$ 1
Fat (g)	71 $\pm$ 6	74 $\pm$ 2
Carbohydrate (g)	229 $\pm$ 17	230 $\pm$ 4
Total sugars (g)	79 $\pm$ 8	82 $\pm$ 2
Fibre (g)	16 $\pm$ 1.3	13 $\pm$ 0.3
<b>Cholesterol</b> (mg)	398 $\pm$ 33	282 $\pm$ 7
Total Saturated Fat (g)	22 $\pm$ 2	25 $\pm$ 1
Total Monounsaturated Fat (g)	26 $\pm$ 3	27 $\pm$ 1
Total Polyunsaturated Fat (g)	16 $\pm$ 1.6	14 $\pm$ 0.4
Linoleic acid (g)	12 $\pm$ 1.3	11 $\pm$ 0.3
<b>Linolenic acid</b> (g)	1.7 $\pm$ 0.28	1.3 $\pm$ 0.04
Calcium (mg)	682 $\pm$ 67	657 $\pm$ 16
<b>Iron</b> (mg)	21 $\pm$ 1.7	13 $\pm$ 0.3
<b>Zinc</b> (mg)	20 $\pm$ 1.8	10 $\pm$ 0.2
<b>Magnesium</b> (mg)	306 $\pm$ 20	231 $\pm$ 4
<b>Copper</b> (mg)	2.3 $\pm$ 0.33	1.1 $\pm$ 0.02
<b>Potassium</b> (mg)	3163 $\pm$ 192	2180 $\pm$ 41
Sodium (mg)	2764 $\pm$ 207	2992 $\pm$ 60
<b>Phosphorus</b> (mg)	1480 $\pm$ 110	1060 $\pm$ 20
Vitamin A ( $\mu$ g)	810 $\pm$ 201	490 $\pm$ 44
<b>Vitamin D</b> ( $\mu$ g)	4.9 $\pm$ 0.79	3.3 $\pm$ 0.11
Vitamin C (mg)	89 $\pm$ 12	67 $\pm$ 3
Folate ( $\mu$ g)	384 $\pm$ 27	379 $\pm$ 10
Thiamin (mg)	1.7 $\pm$ 0.15	1.7 $\pm$ 0.04
<b>Riboflavin</b> (mg)	2.3 $\pm$ 0.16	1.8 $\pm$ 0.04
<b>Niacin</b> (mg)	50 $\pm$ 4	34 $\pm$ 1
<b>Vitamin B6</b> (mg)	1.8 $\pm$ 0.13	1.4 $\pm$ 0.03
<b>Vitamin B12</b> ( $\mu$ g)	16 $\pm$ 2.5	4 $\pm$ 0.2

nutrients in bold= significantly higher on days with traditional food;  
 under-lined nutrients= significantly higher on days with just store-bought food

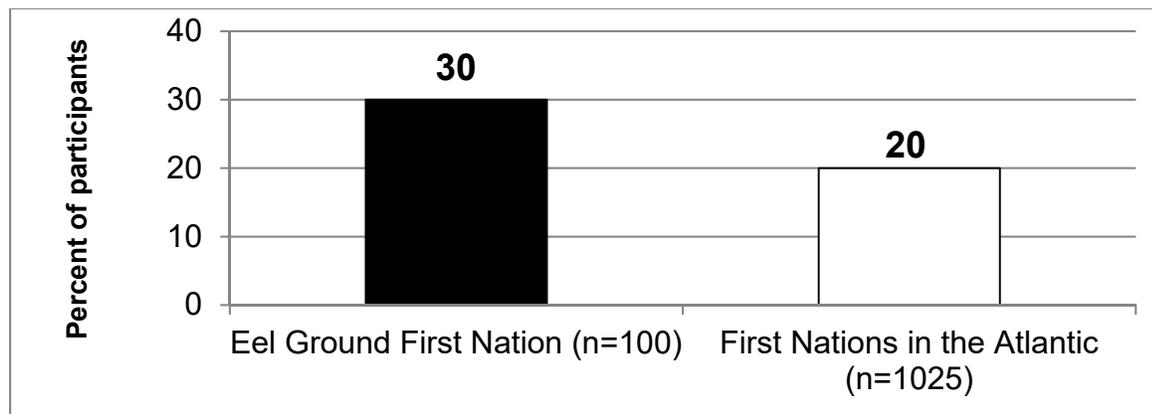
Table 14. Top 10 consumed store-bought food (grams/person/day), ranked by overall decreasing amount of consumption, Eel Ground First Nation compared to all First Nations in the Atlantic region

(refer to Appendix E for conversion from grams to usual household measures)

Eel Ground First Nation (n=100)		First Nations in the Atlantic (n=1025)	
Store-bought Food	g/person/day	Store-bought Food	g/person/day
<b>BEVERAGES</b>		<b>BEVERAGES</b>	
Water, tap*	374	Water, tap*	352
Coffee	341	Carbonated drinks, regular	267
Carbonated drinks, regular	235	Coffee	265
Milk	121	Tea	199
Tea	114	Water, bottled	116
Water, bottled	60	Milk	100
Carbonated drinks, diet	51	Carbonated drinks, diet	73
Fruit drink	22	Fruit drink	59
Hot chocolate	20	Fruit juice	45
Fruit juice	13	Flavoured water	8
<b>FOOD</b>		<b>FOOD</b>	
Pasta/noodles	98	Pasta/noodles	71
Vegetables	83	Vegetables	65
Fruits	58	Potatoes	57
Cereal	50	Bread/buns, white	55
Soup	49	Fruits	42
Bread/buns, white	47	Soup	37
Potatoes	44	Chicken	36
Chicken	41	Pizza	36
French fries/ hash browns	33	Sandwiches	6
Sandwiches	29	Cereal	33

\*Although tap water is technically not a store-bought food, it is categorized as such for the purpose of these analyses.

Figure 30. Nutritional supplement use in Eel Ground First Nation compared to all First Nations in the Atlantic



### **g) Concerns about Climate Change**

Many First Nations communities have reported observations of climate change in their local environment. Sixty-nine percent of adults from Eel Ground First Nation reported that significant climate changes have occurred compared to 49% of all participants (Figure 31). Climate change was mainly perceived to impact the seasonal round or harvest cycle: participants noticed that traditional food was harder to get and the growth and life-cycle patterns of plants and animals had changed (Figure 32).

Figure 31. Percent of all participants who noticed any significant climate change in their traditional territory in the last 10 years, Eel Ground First Nation compared to all First Nations in the Atlantic

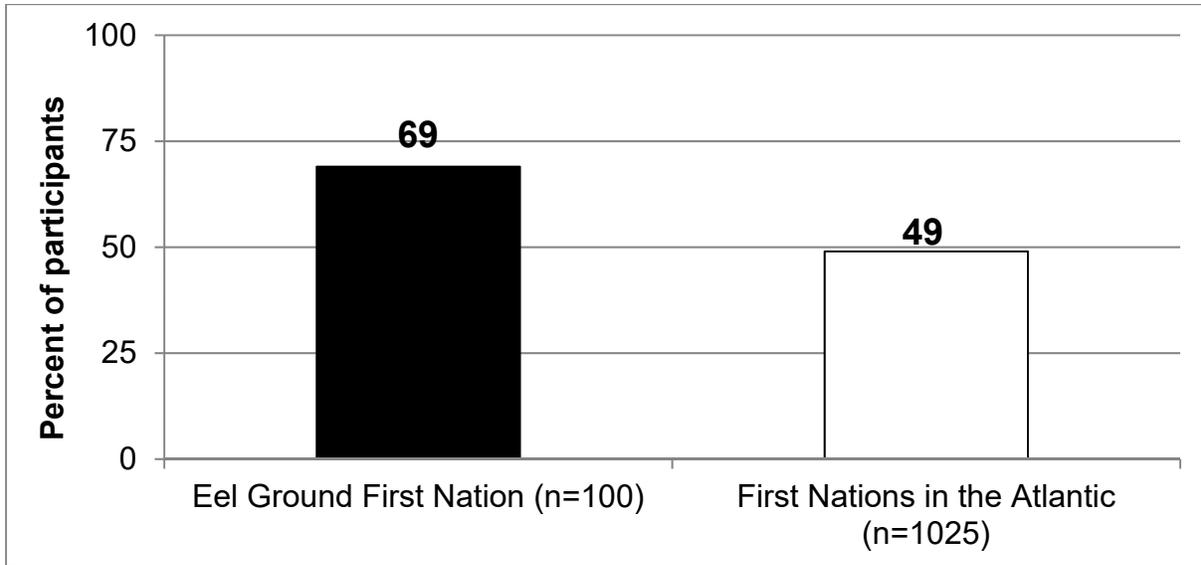
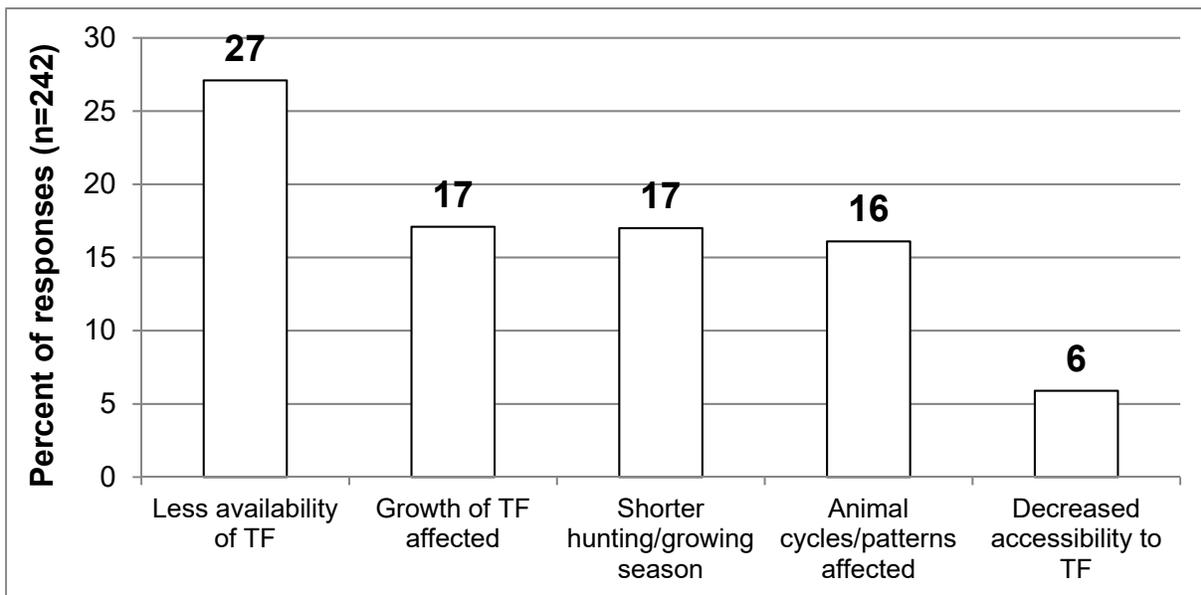


Figure 32. How climate change is perceived to have affected traditional food availability in on-reserve First Nations' households in the Atlantic



## **2. Tap Water Sampling Results**

Drinking water systems which provide water to households and buildings for consumption can include Public Water Systems (PWS), Semi-Public Water systems (SPWS) and private wells also known as Individual Water Systems (IWS). In Eel Ground First Nation, there was 1 PWS reported and 1 private well.

Table 15 provides information about the drinking water distribution system in Eel Ground First Nation. The water treatment plant was built in 1997. The system receives groundwater. According to information obtained from Indigenous Affairs and Northern Development (2010 study), most homes are on a piped distribution system while some are on a private well (FNIH, Personal communication 2015b). In this study, it was reported that there were 235 households: 91% reported that they received tap water from the water treatment plant. In the 12 months preceding the study, no drinking water advisory was issued by the community.

Table 16 contains information on the age of homes and the plumbing systems in Eel Ground First Nation. Participants from Eel Ground First Nation reported that their houses were built between 1969 and 2013: half of the houses were at least 17 years of age. Across the Atlantic, the oldest

house was reported to have been built in 1920 and the newest in 2014 with the typical house at least 20 years old. Nineteen percent of households reported that their plumbing had been upgraded compared to 17% across the Atlantic. The main types of pipes found beneath kitchen sinks were plastic.

In Eel Ground First Nation and in the other participating First Nation communities in the Atlantic, the tap water is mainly supplied from the treatment plant (Figure 33). All households in Eel Ground First Nation have tap water (Figure 34): only 63% reported that they used the tap water for drinking while 98% use it for cooking. Across the Atlantic only 58% of adults reported that they used the tap water for drinking while most (93%) used it for cooking. In Eel Ground First Nation, the main reasons for not drinking the tap water were due to its taste, smell and colour (Figure 35). Twenty-one percent of households (28% across the Atlantic) said that they treated their water. Common methods of treatment included the use of a filter and boiling (Figure 36). When tap water is not available or not consumed, bottled water is the most common alternative source for drinking (Figure 37) and cooking (Figure 38).

In households that reported using tap water for drinking and cooking, the participants were questioned about the use of water from the cold and hot

water taps. Over one third (38%) of those households that used tap water for drinking stated they took water from both hot and cold water taps (Figure 39). Sixty-six percent of households took water from both hot and cold water taps for use in cooking (Figure 40). This is a concern since higher levels of metals are found in hot water as they dissolve more easily in hot water tanks and pipes.

In Eel Ground First Nation, tap water samples from 20 participants' homes were analyzed on-site for chlorine, pH, and temperature. Chlorine is added to water treatment systems for disinfection and the minimum acceptable level for disinfection is 0.2 mg free chlorine/L of water. The pH is a measure of how acidic or alkaline the water is. The optimal range for pH in drinking water is within 6.5 to 8.5. Exposure to extreme high or low pH values can irritate the skin, and in sensitive individuals, may irritate the stomach. Health Canada has set 15°C as the maximum temperature for drinking water as an aesthetic objective (i.e. acceptance by consumers for taste). High water temperatures can accelerate the corrosion of pipes, resulting in higher than normal levels of trace metals in the water.

In 20 samples, free chlorine was detected in the range of 0.11 mg/L to 0.65 mg/L. Four samples were below the minimal level of chlorine needed for disinfection. The pH measurements for all water samples ranged from 6.8 to

7.8, which is within the optimal range. Temperature measurements showed that none of the samples were above the aesthetic objective set by Health Canada.

Table 17 indicates the results of testing for trace metals in drinking water that would affect human health in the twenty water samples from Eel Ground First Nation. The levels of all twenty samples were found to be below guideline values. Table 18 presents the results of testing for trace metals in drinking water from Eel Ground First Nation which would affect its appearance, taste, odour or colour. Manganese levels in 20 homes were found to be above guideline levels. These levels would not pose a threat to human health, however, high levels of manganese can give a strong metallic taste to the water which may discourage community members from drinking the tap water (as demonstrated by results in Figures 34 and 35). The test results, along with fact sheets on how to treat the elevated metal levels, were sent to the community's Chief and Council as well as the regional environmental health manager in July 2015. Each participating household also received a copy of their test results.

There is generally no concern regarding the trace metal levels in the drinking water. However, it is recommended to use water from only the cold water tap

for drinking and cooking to avoid the potential contamination of lead and other metals from the hot water tap.

It is also recommended that the tap water be flushed once in the morning before consumption. This will reduce the level of lead in the water. In addition, flushing the toilet or using the shower before drinking tap water, will also reduce levels of exposure to metals from indoor plumbing. This is a standard recommendation for reducing exposure in older neighbourhoods and homes where lead pipes and lead solder may have been used in water distribution systems (prior to 1986) (Health Canada 2007). Health Canada fact sheets on minimizing lead exposure from the drinking water distribution system are available online at <http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/lead-plomb-eng.php>

Table 15. Public Works Questionnaire Results

Question	Answer
1) Community Name:	Eel Ground First Nation
2) Does your community have a water distribution system (pumping system with water mains) (Y/N)?	Yes
3) Does the community have a water treatment plant (filtration and/or chemicals added) (Y/N)?	Yes
4) What year was the water treatment plant built?	1997
5) What is the name and type of water source that provides water to the community? a. Name of water source. b. Type of water (stream, lake spring, ground water)	a. Central Well (1) two new wells coming on line. b. Groundwater
6) Is the source water filtered at the water treatment plant (Y/N)? If yes, please specify the type of filtration	No. Sand filter no longer operational
7) Is the water chlorinated/disinfected at the water treatment plant (Y/N)? If yes, please specify and if chlorination manual or automatic	Yes. Automatic via chemical feed pump
8) Indicate all chemicals used for water treatment at the plant:	Liquid sodium hypochloride
9) In the past year have there been problems concerning procurement of treatment plant chemicals; replacement parts, maintenance services; testing supplies or services (Y/N)? Describe.	No
10) In your opinion, is your treatment plant up-to-date (Y/N)	No. Funding has been approved for new water source and treatment due to Iron and Manganese levels.
11) In the last year, how many “boil water advisories” were issued? Who issued the boil water advisory? What was the reason for the boil water advisory?	0
12) Are there periods when water is not available to households (interruptions in service) (Y/N)? If yes, please explain:	Yes. When system is flushed - discoloured but useable.
13) What are the pipes of the water distribution system made of?	PVC and metal - cast iron in some older sections of the community
14) Are there any water storage tanks on-reserve (Y/N)? If yes, indicate number, volume and type of tank:	Yes: 2 Tanks (400,000 L total)
15) Are there additional (alternative) sources of drinking water available for community use (Y/N)? a) If yes, please describe each (on reverse side) and if possible estimate the number of people accessing water from these	Yes, One private well in the community

Question	Answer
sources, or if the water from each source is mixed, describe each. b) Is this water tested for fecal coliforms (Y/N)?	
16) Is the water system serving your community staffed and maintained by a trained (certified) water treatment plant operator?	Yes (level 1 - is writing level 2 soon)

Table 16. Characteristics of homes and plumbing in Eel Ground First Nation and for all First Nations in the Atlantic.

<b>Characteristic</b>	<b>Eel Ground First Nation</b>	<b>First Nations in the Atlantic</b>
Average year home was built (range) <i>n</i>	1995 (1969, 2013) 73	1994 (1920, 2014) 781
Percent of households (HH) with upgraded plumbing <i>n</i>	19 100	17 1025
Average year plumbing upgraded (range) <i>n</i>	2008 (1964, 2014) 19	2009 (1964, 2014) 158
Percent of HH that treat water (e.g. boiling, with filters, etc.) <i>n</i>	22 100	27 1025
Percent of HH with a water storage system <i>n</i>	5 100	12 1025
Location of water storage system		
% Inside	100	90
% Outside	0	10
Type of water storage system		
% Able to be carried (bucket)	0	73
% Fixed in place	100	27
<i>n</i>	5	107
Percent of type of pipes under kitchen sink		
Plastic	51	32
Metal	7	6
Plastic with metal fittings	8	7
Copper with braided flex line	13	20
Braided flex line	15	29
Steel flex line	6	5
<i>n</i>	99	977

Figure 33. Source of tap water, Eel Ground First Nation compared to all First Nations in the Atlantic

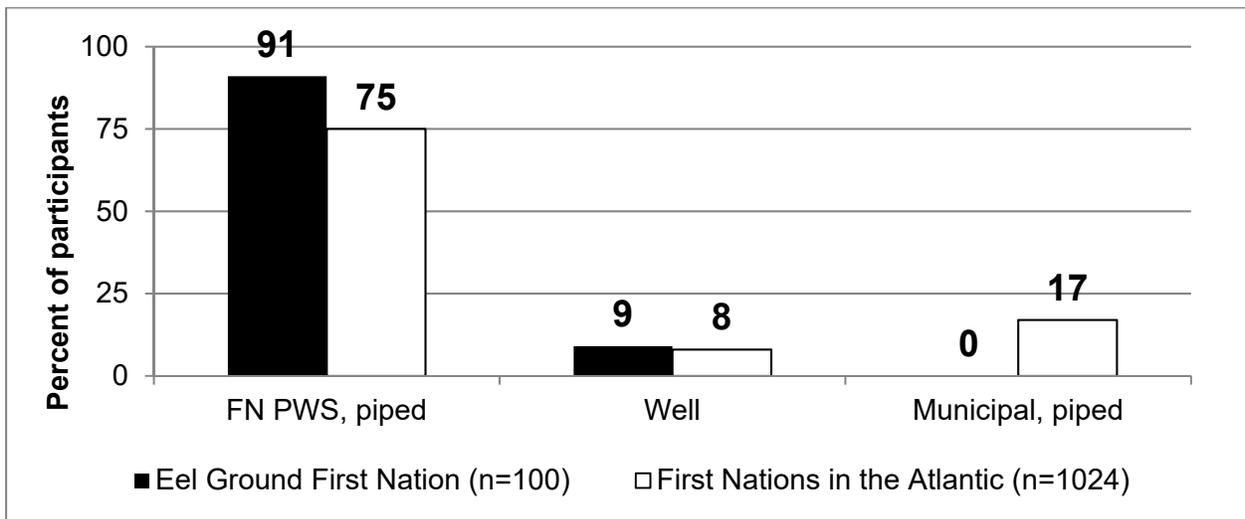


Figure 34. Household water source and use, Eel Ground First Nation compared to all First Nations in the Atlantic

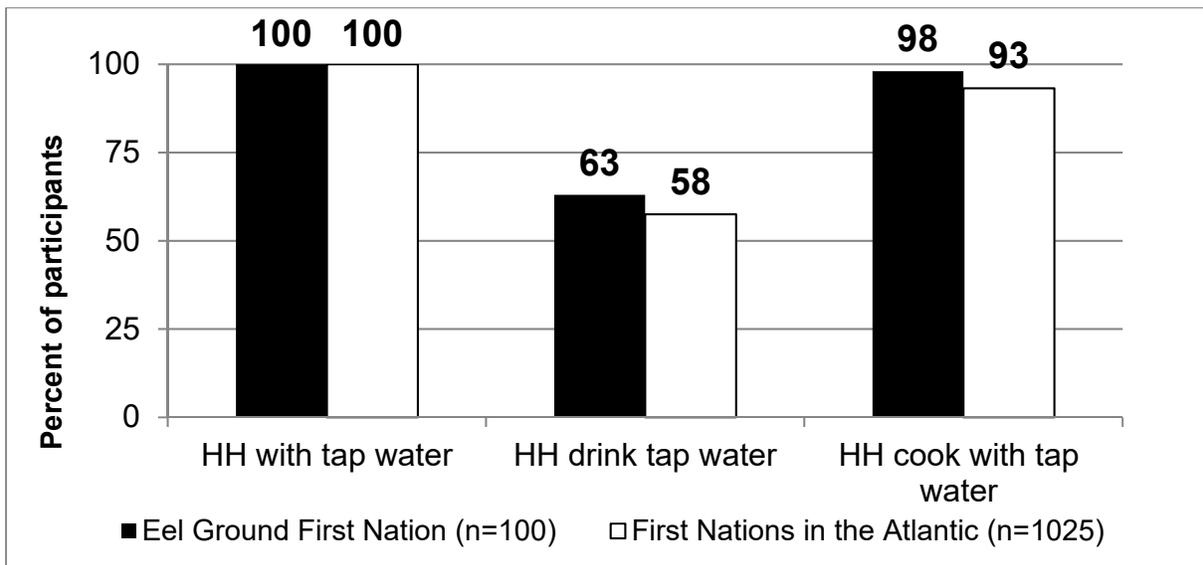


Figure 35. Top five reasons for not drinking the tap water in Eel Ground First Nation and across the Atlantic

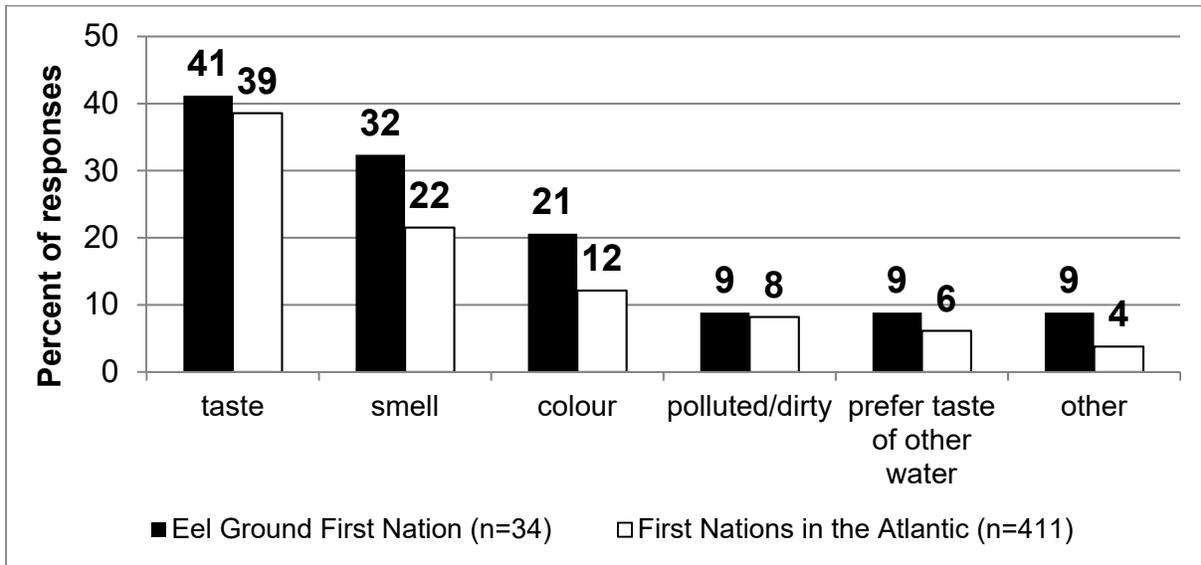


Figure 36. Household methods to treat tap water in Eel Ground First Nation and across the Atlantic

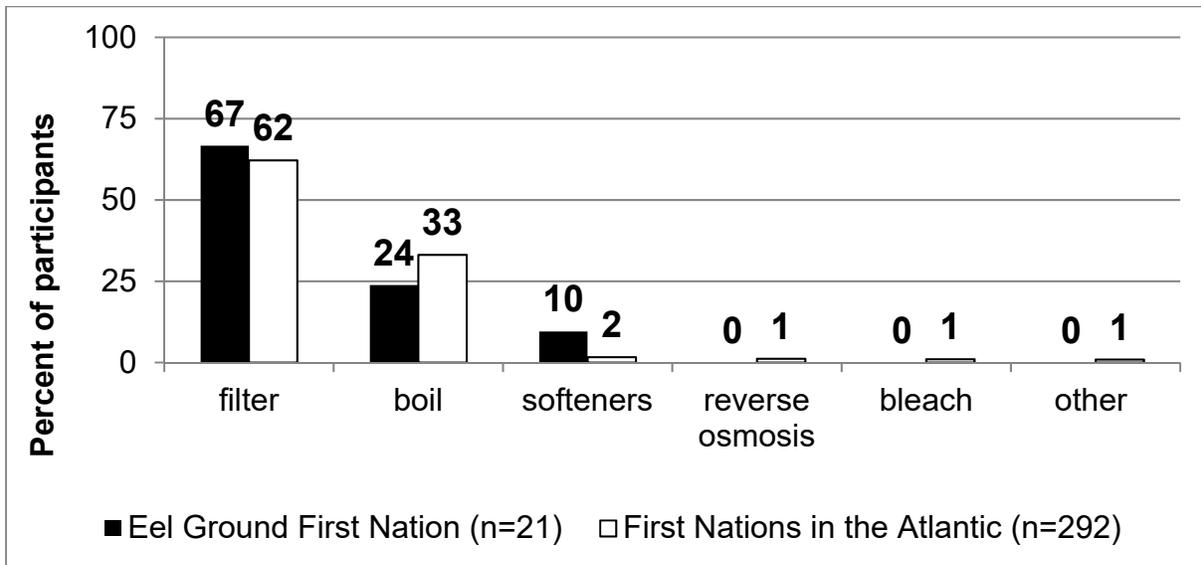
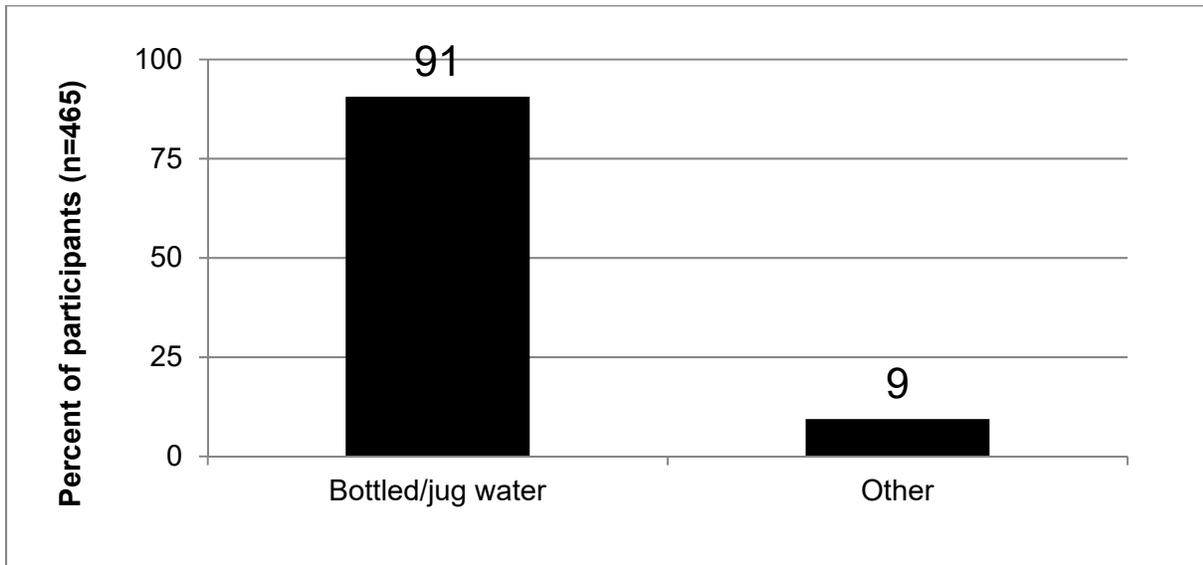
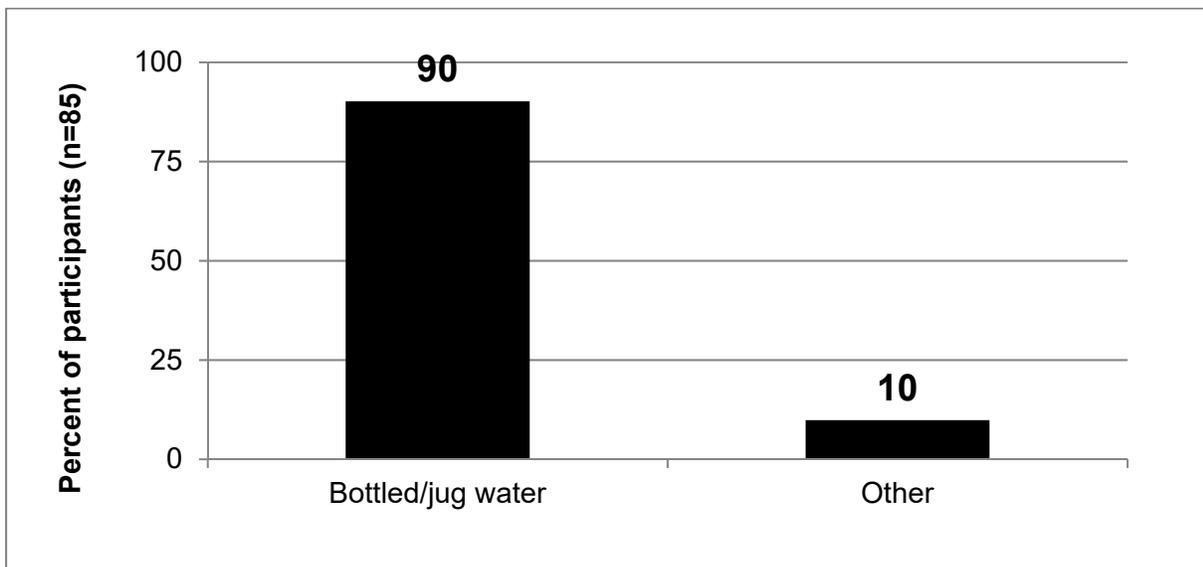


Figure 37. Alternative sources of drinking water used in households in the Atlantic that do not use tap water



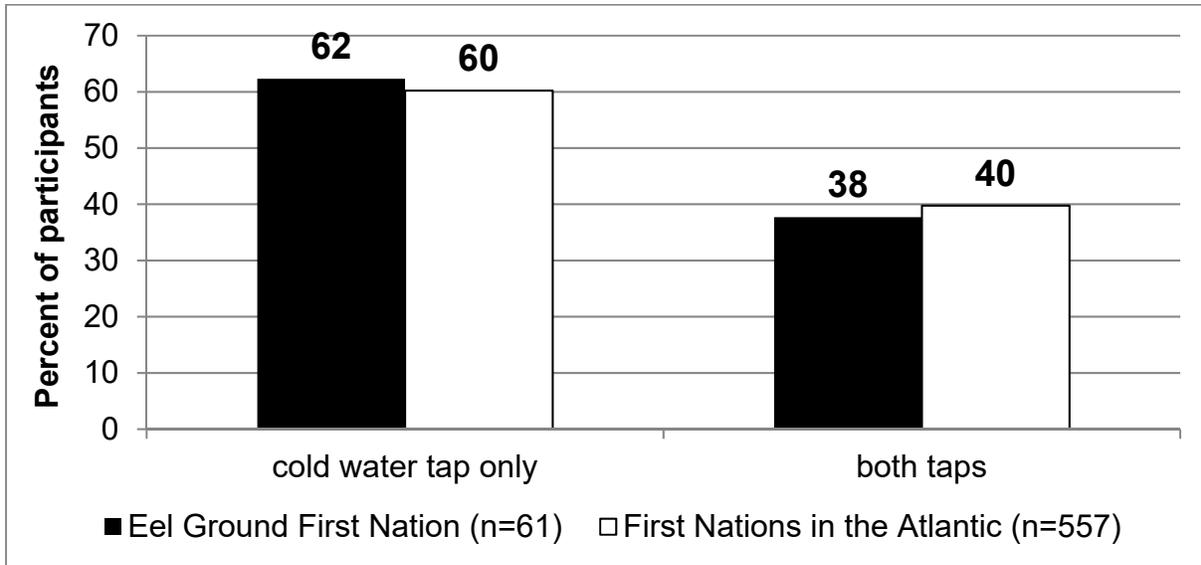
Other= (spring, brook)

Figure 38. Alternative sources of water for preparation of food or beverages in households in the Atlantic that do not use tap water



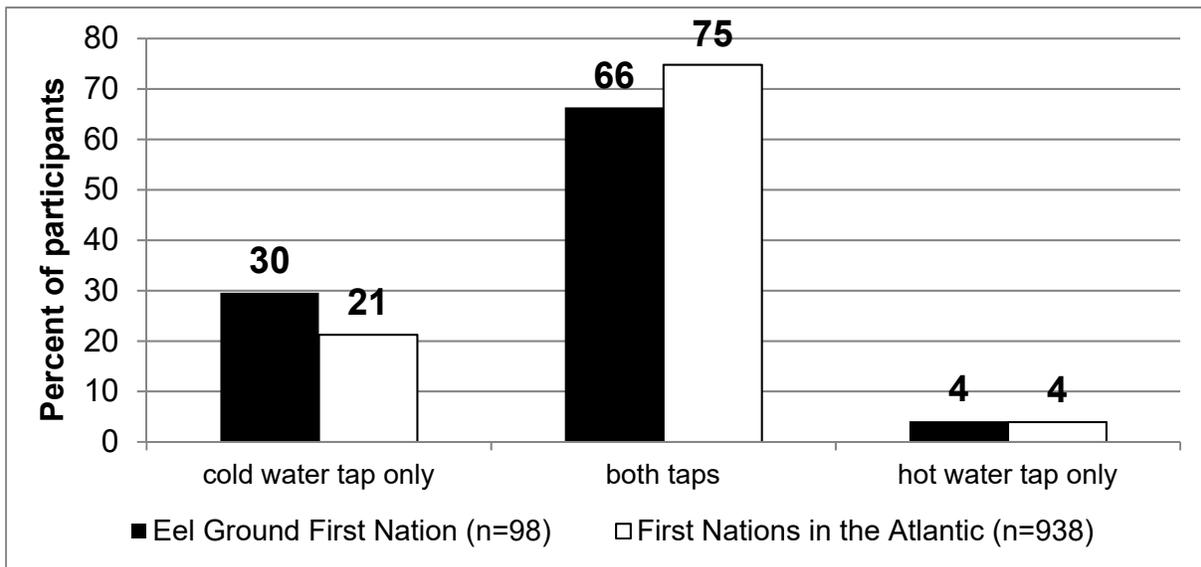
Other= (spring, brook)

Figure 39. Percentage of households that use the cold water tap only or both hot and cold water taps for source of drinking water\*



\*in households that report using tap water

Figure 40. Percentage of households that use the cold water tap only or both hot and cold water taps for preparation of food or beverages\*



\*in households that report using tap water

Table 17. Results of testing for levels of trace metals in drinking water that would affect health, Eel Ground First Nation

Trace Metal Detected	Maximum Detected (ug/L)	Detection Limit (DL) - ug/L	MAC - Maximum Allowable Concentration -GCDWQ, 2012- (ug/L)	Total Number of Samples in Exceeding guideline value			Comments
				First Draw	Flushed (5 Min)	Duplicate	
Antimony, Sb	0	<0.5	<b>6</b>	0	0	0	Below guideline value.
Arsenic, As	0	<1.0	<b>10</b>	0	0	0	Below guideline value.
Barium, Ba	247	<2.0	<b>1,000</b>	0	0	0	Below guideline value.
Boron, B	16	<10	<b>5,000</b>	0	0	0	Below guideline value.
Cadmium, Cd	0	<0.09	<b>5</b>	0	0	0	Below guideline value.
Chromium, Cr	0	<0.5	<b>50</b>	0	0	0	Below guideline value.
Mercury, Hg	0	<0.1	<b>1.0</b>	0	0	0	Below guideline value.
Lead, Pb	1.22	<0.5	<b>10</b>	0	0	0	Below guideline value.
Selenium, Se	0	<0.4	<b>10</b>	0	0	0	Below guideline value.
Uranium, U	0	<1.0	<b>20</b>	0	0	0	Below guideline value.

Table 18. Results of testing for levels of trace metals in drinking water that would affect its appearance, taste, odour, or colour, Eel Ground First Nation

Trace Metal Detected	Maximum Detected (ug/L)	Detection Limit (DL) - ug/L	AO - Aesthetic Objective - GCDWQ, 2012- (ug/L)	Total Number of Samples in Excess		Comments
				First Draw	Flushed (5 Min)	
Aluminum, Al	51	<10	<b>100/200*</b>	0	0	Below guideline value.
Copper, Cu	<b>1470</b>	<1.0	<b>1,000</b>	2	0	Flushed samples below guideline value.
Iron, Fe	148	<50	<b>300</b>	0	0	Below guideline value.
Manganese, Mn	<b>813</b>	<1.0	<b>50</b>	20	20	Above guideline. Elevated levels pose no health concern.
Sodium, Na	7,500	<500	<b>200,000</b>	0	0	Below guideline value.
Zinc, Zn	80.3	<3.0	<b>5,000</b>	0	0	Below guideline value.

*\*The operational guideline for aluminum is 100 ug/L for conventional treatment and 200 ug/L for other treatments.*

### **3. Surface Water Sampling for Pharmaceuticals**

Two pharmaceuticals were detected in the surface water samples collected in the vicinity of Eel Ground First Nation:

- Metformin (diabetes medication) and
- Atenolol (heart medication).

Appendix I shows the geographic locations of the three sampling sites. Table 19 lists the pharmaceuticals and the sites where they were found. The levels of each of the pharmaceuticals found in the water would not be harmful to human health. However, the health effects of the mixtures found at the sampling sites are unknown at this time.

There are currently no Canadian guideline levels for pharmaceuticals in surface water. The pharmaceuticals found in the water were probably excreted by individuals from or near the community. As sewage treatment plants do not remove pharmaceuticals from wastewater, pharmaceuticals get into the environment. To reduce the presence of pharmaceuticals in the environment, it is recommended to return unused or expired prescription drugs, over-the-counter medications and natural health products to a local pharmacy for proper disposal instead of flushing them down the toilet or throwing them into the garbage.

Table 19. Pharmaceuticals measured in surface water near Eel Ground First Nation

Pharmaceuticals Detected in Eel Ground First Nation	Max (ng/L) in Eel Ground First Nation	Detection Limit (ng/L)	Number of Samples Collected in Eel Ground	Number of Samples Detected in Site		
				1) Miramichi River-downstream from lagoon outfall	2) Miramichi River – fishing area	3) Miramichi River-salmon fishery site
Anti-diabetics						
Metformin	34	10	4	2	0	0
Antihypertensives (Beta-blocker)						
Atenolol	18.6	5	4	2	1	1

#### **4. Mercury in Hair Results**

Among the 1025 FNFNES participants from the Atlantic region, 643 individuals consented to hair sampling for mercury (63% of the total). After excluding samples from participants who did not provide their age, did not complete the questionnaire or the 24-hour recall, as well as samples with too little hair, a total of 632 samples were included in the analyses.

Health Canada has a mercury guideline of 2 µg/g in hair (8 ppb mercury in blood) for children, women of childbearing age and 6 µg/g in hair for adult males and older women (20 ppb mercury in blood). In this study, a three-centimetre long piece of hair was collected to measure mercury intake over a three-month period. If the person had very short hair, only 1 centimetre of hair was taken (representing the last 30 days). The one centimetre segments of hair were analyzed separately: an individual's usual intake of mercury was calculated from the average of the three separate samples or the single sample provided from people with short hair. Hair concentrations were converted to blood equivalent concentration using a conversion factor of 0.004 to facilitate the comparison with previous data.

A total of 84 hair samples (57 from women and 27 from men) were collected from Eel Ground First Nation. Twenty-eight women of childbearing age (CBA) provided hair samples.

Table 20 compares the results from the 84 Eel Ground First Nation participants who completed all aspects of the study to Health Canada's proposed guidance values for health risk associated with mercury exposure. Results show that the risk of mercury exposure is currently low among participants in Eel Ground First Nation. No individual in the study exceeded the mercury in blood guideline value of 20 parts per billion (ppb).

Figure 41 shows the concentrations of mercury in hair of all participants from Eel Ground First Nation while Figure 42 presents hair results only for women in their childbearing years. These figures show that no man or woman exceeded the 20 ppb Health Canada mercury in blood guideline (Figure 41) and no woman of childbearing age exceeded the 8 ppb mercury in blood guideline for women of childbearing age (Figure 42).

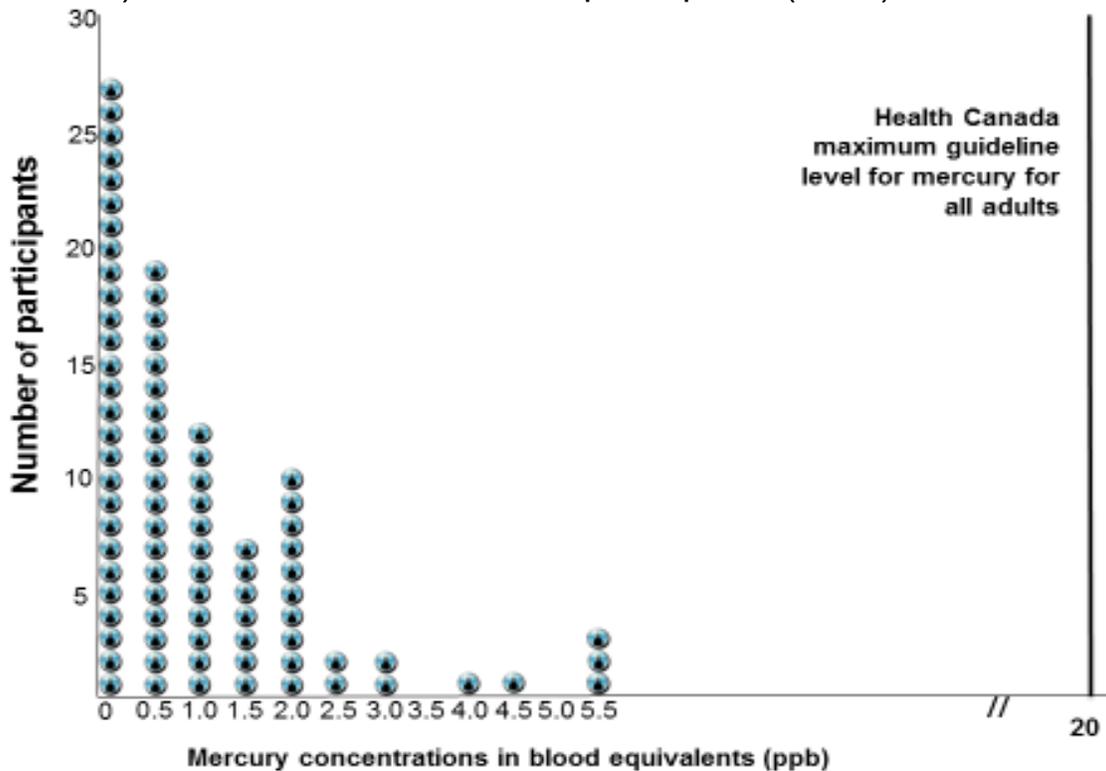
Table 21 compares Eel Ground First Nation mercury in hair results to those of past studies from Eel Ground First Nation. The mercury levels found in this study were similar to those found in past studies (Medical Services Branch 1979, 1984 and 1999).

Table 22 shows that the mercury levels in Eel Ground First Nation are lower than those found in the Canadian Health Measures Survey (2007-2009), Health Canada, 2010.

Table 20. Average total mercury concentrations (converted to blood equivalents in parts per billion) for all Eel Ground First Nation participants and for women of childbearing age compared to Health Canada’s proposed blood guidance values

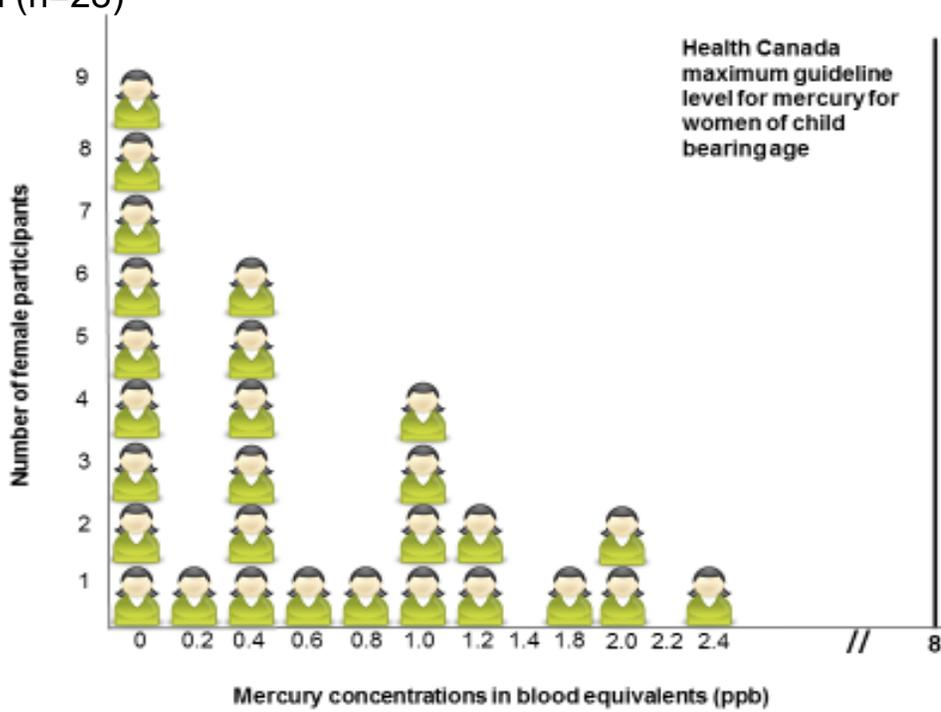
Group	Average total mercury concentration (ppb) Eel Ground First Nation participants	Mercury in blood Guidance value (ppb) Health Canada
Eel Ground population	1.20	20.00
Women of child-bearing age	0.38	8.00

Figure 41. Concentration of mercury in hair (converted to blood equivalents) of Eel Ground First Nation participants (n=84)



Mean = 1.20  
 Std. Dev. = 1.29  
 n = 84

Figure 42. Concentration of mercury in hair (converted to blood equivalents) of female participants of childbearing age in Eel Ground First Nation (n=28)



Mean = 0.38  
 Std. Dev. = 0.62  
 n = 28

Table 21. Mercury levels in Eel Ground First Nation from past studies\* compared to current study

Year	No of total samples	Hair levels converted to blood level equivalents in ppb (ug/L)					Maximum level
		0-19 ppb	20-29 ppb	30-39 ppb	40-49 ppb	>50 ppb	
1978	56	56					0-19
2014	84	84					5.99

\*Methylmercury in Canada, Exposure of First Nations and Inuit Residents to Methylmercury in the Canadian Environment Volumes 1-3, 1979, 1984 and 1999.

Table 22. Average mercury levels in blood for the general Canadian population\* by age group

General Canadian population, sorted by age group	Average mercury levels in blood (ppb)
20-39	1.28
40-59	1.88
60-79	1.55
Eel Ground First Nation	1.20

\*Health Canada, 2010. Canadian Health Measures Survey Cycle I (2007-2009).

## 5. Food Contaminant Results

A total of 135 traditional food samples from 38 different species of plants and animals were collected from Eel Ground First Nation for contaminant analyses. Appendix A provides further explanations about these contaminants. Information collected about the harvesting location of the foods is available in Appendix J.

Contaminant exposure analyses were completed using the Hazard Quotient (HQ) method. In this approach, the daily contaminant intake is divided by the provisional tolerable daily intake (PTDI) guideline level. It is important to note that risk exposure analysis was completed only for traditional food and not for store-bought food.

The daily contaminant intake was calculated from the traditional food consumption data (see Table 9) and the traditional food sample results (Tables 23 and 27). The PTDI level represents the daily exposure to a contaminant that is unlikely to have an adverse health affect over a lifetime. The risk of harm will be negligible if the HQ is 1 or less. The HQ was calculated for both the average traditional food consumer (average intake/PTDI) and the heavy traditional food consumer (95<sup>th</sup> percentile intake/PTDI). Due to the susceptibility of the fetus to mercury toxicity, the

PTDI for women of child bearing age is lower than for adult males and females over 50: hence for mercury, the HQ is calculated separately for females of child-bearing age.

For your community, there is some uncertainty around the levels of contaminants in traditional food from your community. Only 14 of the 30 traditional foods eaten in greatest amounts (see Table 9) were collected. Among these, fewer than 5 separate samples for each food item were obtained for most foods (Appendix K). As contaminant levels vary between samples, it is difficult to accurately assess the average amount of contaminants in a food when there are limited food samples. When foods were eaten but no local food sample was obtained, contaminant data from foods collected in other participating First Nations in the Atlantic were substituted.

## **Heavy Metals**

Table 23 presents the concentrations of four toxic metals (arsenic, cadmium, lead and mercury) in the Eel Ground First Nation traditional food samples. Mercury was further analyzed to quantify the more toxic form of methyl mercury, particularly in fish samples where the mercury concentrations are usually higher than in other foods.

Heavy metal risk exposure analysis results are displayed in Tables 24, 25 and 26. Table 24 shows the top 10 traditional food contributors of arsenic, cadmium, lead, and mercury in the diet. The average daily intakes of the four toxic metals from traditional food are presented in Table 25.

**Arsenic:** Low levels of arsenic were found in fish and shellfish samples. The traditional food sources of arsenic are lobster and haddock. Although no haddock samples were obtained from your community, as mentioned above, when no samples were available from a specific community, values from other participating communities were used to estimate contaminant intake. However, the arsenic accumulated in animal tissues is mainly in a non-toxic organic form known as arsenobetaine and should not be of any safety concern (Agency for Toxic Substances and Disease Registry (ATSDR)). For both the average and heavy traditional food consumers from Eel Ground First Nation, the HQ values for arsenic were lower than 1, therefore the risk of harm is negligible based on current consumption.

**Cadmium:** The highest levels of cadmium were found in moose liver (Table 23). Higher concentrations of cadmium are found in the liver and kidneys of mammals since this metal tends to accumulate in organ meat. Cadmium is also commonly found in shellfish. Mussels and fiddleheads were the main

traditional food source of cadmium in the diet (Table 24). Risk exposure analysis, however, revealed that the average (average/PTDI) and high end (95<sup>th</sup> percentile/PTDI) HQ values for cadmium were lower than 1. Therefore, the risk of harm is negligible based on current consumption.

**Lead:** Of the traditional food samples obtained from your community, the highest concentration of lead was found in squirrel meat samples (89.3 ug/g) (Table 23). The elevated levels of lead in game meat is likely to be a result of lead residuals from lead shot or lead-containing ammunition. Therefore, consumers should be aware of the potential risk of eating any waterfowl and game killed by lead containing ammunition. Lead ammunition can shatter into fragments too small to detect and remove (Bellinger, et al., 2013). A study in Minnesota found that only 30% of lead fragments were within 2 inches of the exit wound: some lead fragments were found 18 inches away from the exit hole. Rinsing the meat is not effective as it merely spreads the lead fragments (Grund, Cornicelli, Carlson, & Butler, 2010).

As mussels and moose meat were more frequently consumed than squirrel, these were the two main traditional food sources of lead in the diet (Table 24). The elevated levels of lead in mussels are due to the fact that mussels are filter feeders and tend to accumulate higher levels of lead. However,

since no mussel or moose samples were analyzed from your community, values from other participating communities were used to estimate contaminant intake. Risk exposure analysis revealed that the average (average/PTDI) and high end (95<sup>th</sup> percentile/PTDI) HQ values for lead were lower than 1. Therefore, the risk of harm from overall lead exposure from traditional food in your community is **low** based on current consumption.

However, because of the recent findings that there is no threshold for lead toxicity, i.e., any lead exposure will lead to adverse effects, particularly among children, Health Canada no longer uses the HQ approach for risk assessment. A more comprehensive approach that monitors background exposure including all sources of lead (including market food and drinking water) is needed to characterize the additional risk of lead exposure from traditional food consumption. Hunters and their families who consume a lot of game meat hunted with lead shot and are concerned about their lead exposure may need to investigate their total exposure by measuring lead concentrations in their blood.

**Mercury:** Of the samples analyzed, the highest levels of mercury were found in brook trout and striped bass (Table 23). Based on current consumption

and concentrations in food samples, brook trout, lobster and salmon were the primary traditional food contributors of mercury in the diet (Table 24).

For mercury, risk exposure analysis was undertaken for all adults and separately for female participants of childbearing age. Due to the susceptibility of the fetus to mercury toxicity, the PTDI for women of child bearing age is lower at 0.2 µg/kg/day. For all adults, both the average (average/PTDI) and high end (95<sup>th</sup> percentile/PTDI) HQ values for mercury were lower than 1, which means that for adults in the community, the risk of harm is **negligible** based on current consumption (Table 25). Table 26 shows the exposure estimates for mercury for the female participants of child bearing age. The HQs for the average and 95<sup>th</sup> percentile intake were both below 1, which means that the risk of mercury exposure from traditional food is **negligible** for women of child bearing age. These results agree with the findings from the hair mercury analyses (Section 4) that the risk of mercury exposure in Eel Ground First Nation is minimal.

### **Persistent Organic Pollutants**

Fish were targeted for POP analyses due to their greater consumption and higher fat content (POPs accumulate in fatty tissues). Traditional food

analysis results are presented in Table 27 and exposure calculations are found in Table 28.

**Polycyclic Aromatic Hydrocarbons (PAHs):** No PAHs were detected in traditional food samples analysed.

**Organochlorines:** Foods were tested for various fungicides, insecticides, and pesticides such as hexachlorobenzene (HCBs), a by-product of DDT known as dichlorodiphenyldichloroethylene (*p,p*-DDE), a by-product of chlordane known as *trans*-Nonachlor, and toxaphene. Foods were also tested for total PCBs. All concentrations were very low at the parts per billion level and the variations in concentrations were largely due to the different fat content in different foods.

**Perfluorinated compounds (PFCs):** The highest concentration was found in shad samples. However, there is no concern with exposure to PFCs from eating any of the food sampled.

**Polybrominated diphenyl ethers (PBDEs):** Concentrations of the fire retardant chemicals known as PBDEs were all very low at the parts per billion level.

## **Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans**

**(PCDD/Fs):** Only trace amounts were found in most foods. The highest concentration among the Eel Ground First Nation samples was found in brook trout and shad. The reason for this is not known, however, there is no concern of dioxin and furans exposure from any of the food sampled.

Table 28 shows the result of estimated daily intake of organic contaminants including HCBs, DDE, PCB, Chlordane, Toxaphene, PAHs, PFCs, PBDE, Dioxin and Furans using the respective average concentrations. All the HQs were below 1, indicating that there is negligible risk of exposure to these contaminants through consumption of traditional food.

## Heavy Metals

Table 23. Levels of toxic trace metals in traditional food samples collected from Eel Ground First Nation (ug/g fresh weight)

Traditional Food	Number of samples	Arsenic (As)	Cadmium (Cd)	Lead (Pb)	Mercury (Hg)	Methyl Mercury* (MeHg)
<b>FISH</b>						
Brook trout (speckled)	5	0.6	0.03	0.01	0.4	0.2
Crab, Atlantic snow	2	4.9	0.03	0.02	0.1	NM
Lobster	5	2.4	0.05	0.01	0.1	0.1
Salmon, Atlantic	10	0.6	0.003	ND	0.1	0.1
Shad	3	7.4	0.04	0.03	0.1	0.03
Smelt	3	0.9	0.003	ND	0.03	0.03
Striped Bass	3	0.6	0.001	0.01	0.3	0.3
White sucker	2	0.1	0.01	ND	0.1	0.1
<b>LAND ANIMALS</b>						
Deer meat	3	0.03	0.005	0.1	0.01	NM
Moose heart	5	ND	0.03	0.01	0.002	NM
Moose liver	3	0.01	1.7	0.03	0.002	NM
Moose nose	3	0.01	0.02	0.02	0.002	NM
Moose tongue	3	0.01	0.03	0.02	0.001	NM
Rabbit meat	3	ND	0.002	0.02	0.001	NM
Squirrel meat	2	0.03	0.01	89.3	0.01	NM
<b>BIRDS</b>						
Partridge (grouse)	3	0.01	0.01	1.1	0.002	NM
<b>PLANTS/BERRIES</b>						
Bergamot (Oswego) tea	3	0.002	ND	ND	ND	NM
Blackberries	2	ND	0.01	0.01	ND	NM
Blueberries	5	ND	0.002	0.01	ND	NM
Cranberries	3	ND	0.004	0.01	ND	NM
Dandelion tea	3	0.002	0.001	ND	ND	NM
Fiddleheads	5	ND	0.1	0.01	ND	NM
Labrador tea	3	0.001	0.0001	ND	ND	NM
Mint tea	1	0.001	0.001	ND	0.0001	NM
Raspberries	3	ND	0.02	0.04	ND	NM
Raspberry leaf tea	3	0.002	0.0004	ND	ND	NM
Muskroot (wihkes)	3	0.004	0.0001	ND	ND	NM
Teaberry (wintergreen) tea	4	0.0003	ND	ND	ND	NM
Yarrow tea	2	0.001	0.002	ND	ND	NM
<b>TREE FOODS</b>						
Crabapple	4	ND	ND	0.01	ND	NM
Hazelnut	3	0.01	0.03	0.02	ND	NM

<b>Traditional Food</b>	<b>Number of samples</b>	<b>Arsenic (As)</b>	<b>Cadmium (Cd)</b>	<b>Lead (Pb)</b>	<b>Mercury (Hg)</b>	<b>Methyl Mercury* (MeHg)</b>
Hemlock bark tea	3	0.0004	0.003	ND	ND	NM
Maple-bark tea	3	0.001	0.0002	ND	ND	NM
Spruce tea	2	0.001	0.0002	ND	ND	NM
Tamarack bark tea	3	0.001	0.0001	ND	ND	NM
White cedar needle tea	1	0.001	0.001	ND	ND	NM
White pine cone tea	3	0.001	0.0001	ND	ND	NM
Yellow birch bark tea	3	0.001	0.001	ND	ND	NM
<b>GARDEN FOODS</b>						
Corn	3	0.005	0.02	0.01	0.002	NM
Rhubarb	3	ND	0.01	0.1	ND	NM
Squash seeds	3	ND	0.02	0.2	0.01	NM
Sunflower seeds	3	0.02	0.3	0.01	0.01	NM

ND = Not Detectable

NM = Not Measured

\*ng/g fresh weight

Table 24. Top 10 traditional food contributors to contaminant intake, Eel Ground First Nation\*

Arsenic		Cadmium		Lead		Mercury	
Traditional Food	%	Traditional Food	%	Traditional Food	%	Traditional Food	%
Lobster	18.8	<i>Mussels</i>	20.5	<i>Mussels</i>	24.9	Brook trout (speckled)	20.2
<i>Haddock</i>	17.0	<i>Oysters</i>	15.4	Moose meat	24.0	Lobster	14.4
Crab, Atlantic snow	11.6	Moose liver	10.9	<i>Quahog clam</i>	13.8	Salmon, Atlantic	13.1
<i>Shrimp</i>	11.3	<i>Scallops</i>	10.5	Deer meat	5.8	<i>Atlantic cod</i>	10.7
<i>Atlantic cod</i>	10.8	Lobster	10.3	Lobster	5.5	Striped bass	9.7
<i>Mussels</i>	5.6	Fiddleheads	9.2	Grouse meat	4.0	<i>Haddock</i>	8.4
<i>Scallops</i>	5.3	Moose meat	5.5	<i>Corn/hominy</i>	3.0	Crab, Atlantic snow	5.0
Salmon, Atlantic	3.6	<i>Corn/hominy</i>	4.1	<i>Oysters</i>	2.9	<i>Shrimp</i>	2.7
<i>Quahog clam</i>	3.3	<i>Shrimp</i>	3.7	Crab, Atlantic snow	2.7	<i>Halibut</i>	2.2
<i>Halibut</i>	2.5	<i>Quahog clam</i>	2.6	Beans	2.5	<i>Scallops</i>	2.0

\*Contaminant values were taken from the regional Atlantic food samples (foods that are in italics) when no samples were available from your community.

Table 25. Exposure estimates ( $\mu\text{g}/\text{kg}$  body weight/day) for metals from traditional food using average concentrations, Eel Ground First Nation (n=100)

Metal	PTDI (ug/kg/day)	n>PTDI	Average	Median	95 <sup>th</sup> percentile	HQ Average/PTDI	HQ 95 <sup>th</sup> /PTDI
<b>Arsenic</b>	1	2	0.19	0.06	0.90	0.19	0.90
<b>Cadmium</b>	1	0	0.01	0.003	0.04	0.01	0.04
<b>Lead</b>	3.6	0	0.004	0.001	0.02	0.001	0.004
<b>Mercury</b>	0.5	0	0.01	0.00	0.03	0.01	0.06

Table 26. Exposure estimates ( $\mu\text{g}/\text{kg}$  body weight/day) for mercury from traditional food (using average concentrations) among Eel Ground First Nation women of child bearing age (n=28)

Level of mercury concentration	PTDI (ug/kg/day)	n>PTDI	Average	Median	95 <sup>th</sup> percentile	HQ Average/PTDI	HQ 95 <sup>th</sup> /PTDI
<b>Average</b>	0.2	0	0.01	0.003	0.05	0.04	0.25

## Persistent Organic Pollutants

Table 27. Levels of persistent organic pollutants in traditional food samples collected from Eel Ground First Nation

Food	Sample size	PAH <sup>a</sup>	Hexa-chlorobenzene <sup>b</sup>	<i>p,p</i> -DDE <sup>b</sup>	Chlordane <i>trans</i> -Nonachlor <sup>b</sup>	Total toxaphene <sup>b</sup>	Total PCBs <sup>b</sup>	Total PFCs <sup>b</sup>	Total PBDEs <sup>b</sup>	Total dioxin and furans <sup>c</sup>
<b>FISH &amp; SHELLFISH</b>										
Striped Bass	3	ND	0.5	11.5	0.6	0.2	7.5	2.0	1.5	0.04
Brook trout (speckled)	5	ND	0.3	12.9	ND	ND	2.3	3.4	0.4	0.1
Salmon, Atlantic	10	ND	1.2	7.2	0.7	1.2	3.6	2.1	0.5	0.02
Shad	3	ND	0.7	4.5	0.9	1.5	6.2	4.1	1.0	0.1
Smelt	3	ND	0.5	2.2	0.2	ND	1.9	2.5	0.5	0.04
White sucker	2	NM	NM	NM	NM	NM	NM	2.7	NM	NM
Lobster	5	ND	0.1	0.5	0.0	ND	0.4	3.8	0.2	0.01
<b>GAME</b>										
Deer meat	3	NM	NM	NM	NM	NM	NM	0.1	NM	NM

<sup>a</sup>ng TEQ/g fresh weight

<sup>b</sup>ng/g fresh weight

<sup>c</sup>ng TEF/kg fresh weight

ND = Not Detectable

NM = Not Measured

Table 28. Exposure estimates ( $\mu\text{g}/\text{kg}$  body weight/day) for persistent organic pollutants from traditional food using average concentrations, Eel Ground First Nation (n=100)

Persistent organic pollutants*	PTDI (ug/kg/day)	n>PTDI	Average	Median	95 <sup>th</sup> percentile	HQ Average/PTDI	HQ 95 <sup>th</sup> /PTDI
HCBs	0.27	0	0.00003	0.00002	0.0001	0.0001	0.0003
DDE	20	0	0.0002	0.0001	0.001	0.00001	0.00003
PCB	1	0	0.0001	0.0001	0.001	0.0001	0.001
Chlordane	0.05	0	0.00002	0.00001	0.0001	0.0003	0.001
Toxaphene	0.2	0	0.00002	0.00001	0.0001	0.0001	0.0003
PAHs	40	0	0	0	0.00001	0	0
PFOS	0.08	0	0.0003	0.0002	0.001	0.004	0.01
PBDE	0.1	0	0.00002	0.00001	0.0001	0.0002	0.001
Dioxin and Furans	2.3 pg/kg/day	0	0	0	0.00001	0	0

\*PAHs, PFOS, PBDE, Dioxin and Furans TDI are reference doses used by Health Canada, 2005

## CONCLUSIONS

This is the first comprehensive study addressing the gaps in knowledge about the diet and traditional food of First Nations in the Atlantic AFN regions and the environmental contaminants to which they are exposed. The overall results indicate that traditional food is safe to eat and contributes important nutrients to the diets of First Nations in the Atlantic. Participants' own comments about the ongoing relevance of traditional food for well-being are found in Appendix L.

Food insecurity, obesity, smoking, and diabetes are major health issues for this community, as well as for First Nations in the Atlantic. The diet does not meet nutrition needs; there are excess intakes of fat and sodium, and inadequate intakes of fibre, vitamin A, vitamin B6, vitamin C, vitamin D, folate, calcium, and magnesium.

These findings highlight the need to strengthen ongoing efforts at the community, regional, provincial and national level to improve food security and nutrition in First Nations communities through a social determinant to health approach. It is recognized that there are many community-led initiatives currently addressing these issues, such as community gardens, and the Health Canada supported Canada Prenatal Nutrition Program and

the Aboriginal Diabetes Initiative. Beyond the need for increased income at the household level, other potential activities include: subsidized traditional food harvesting and community agriculture (such as greenhouses and freezers), bulk buying programs (such as the *Good Food Box and Buying Club programs*), and nutrition education and cooking programs (such as community kitchens). Policies that promote healthy meals at preschool, school and community events would also reinforce the importance of healthy food choices for better health of all community members. *Eating Well with Canada's Food Guide for First Nations, Inuit and Métis* and *Healthy Food Guidelines for First Nations Communities*, by the First Nations Health Council in B.C. (both available online) are two resources designed to assist communities to promote and serve healthier food in schools and at community events. Both can assist communities in developing healthy food policies. The Healthy Food Guidelines provide an expanded list of appropriate foods for all kinds of community settings. Appendix M of this report, adapted from the First Nations Health Council's Healthy Food Guidelines, contains a listing of the types of foods to serve (and not serve) at community events.

There is generally no concern with the trace metal levels in the drinking water collected. It is recommended that the tap water be flushed (run until the water

is cold) once in the morning before consumption. It is also recommended that drinking and cooking water be taken only from the cold water taps. Low levels of two pharmaceuticals (diabetes and heart medication) were found in the surface water but these levels pose no risk to human health.

Contaminant levels in most traditional food samples collected were at low levels and should pose no health risk to the consumer when consumed at the current rate. However, there is a higher level of uncertainty around risk exposure due to the limited number of food samples. Both the hair sampling and diet estimate results showed that there is currently minimal concern of mercury exposure.

There may be occasional contamination of game meat from lead due to the use of lead containing ammunition in hunting. Lead ammunition can shatter into fragments several inches from the entry and exit site. The fragments can be too small to see and remove. Rinsing the meat can spread the lead fragments. Using non lead containing ammunition is suggested to avoid exposure to lead that could be potentially hazardous to both children and adults.

In October 2016, FNFNES returned to the community to share the results and obtain feedback before finalizing the report. Eight individuals attended

the presentation at the Health Centre. The food security results were considered to be accurate. There was some surprise about the limited amount of traditional food consumed, given the salmon fishing culture. Attendees felt it would be valuable to both repeat the study to monitor changes and to include youth as well. Interest was also expressed in learning more about the impacts of pharmaceuticals on aquatic and human health.

The data collected in this report will serve as a benchmark for future studies of this type to determine if changes in the environment are resulting in an increase or decrease in concentrations of chemicals of concerns, and how diet quality will change over time.

#### Highlights of results:

1. The diet of First Nations adults in the Atlantic does not meet nutrition needs, but the diet is healthier when traditional foods are eaten.
2. Overweight/obesity, smoking, and diabetes are major public health issues.
3. Household food insecurity is a major issue.
4. Water quality, as indicated by the trace metals and pharmaceutical levels, is overall satisfactory, but close monitoring is warranted as water sources and water treatment vary greatly.

5. The overall mercury exposure, as measured in hair samples and calculated through dietary estimates, is low.
6. Elevated levels of lead were found in some food items. It is important to identify the sources.
7. Chemical contamination of traditional food is not worrisome, but it is important to have the data from this study for future monitoring of trends and changes.

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## **Appendix A. Summary of contaminant information**

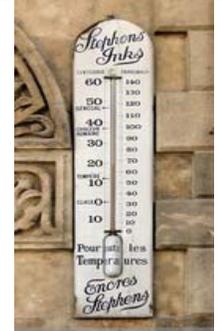
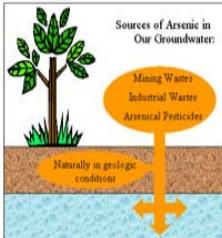
There are many sources of environmental contaminants other than traditional food, some of which we do not have control over. Tables A.1 and A.2 list the most common contaminants (persistent organic pollutants and metals) found in the Canadian environment, where they are found and potential harmful effects on human health. The last column in both tables lists the ways that we can personally minimize exposure, as it is often continuous exposure over a long period of time that can lead to health problems.

**Table A.1. Persistent Organic Pollutants (POPs)**

Name of POP	Where are they used?	Example of use	Where are they found?	Potential harmful effects	Guideline levels	How to minimize exposure
Polychlorinated biphenyls (PCBs)	Used in electrical equipment, lubricants, sealing and caulking compounds, paints		Fats in foods of animal origin such as some fish, meat and dairy products	May cause liver and kidney cancer; developmental problems in children	TDI=0.001 mg/Kg BW/day	<ul style="list-style-type: none"> <li>Choose lower fat foods such as lean meats and low fat milk products</li> </ul>
Dichlorodiphenyl-trichloroethane (DDT)	Pesticide now banned in Canada and many other countries but still in use in some developing countries		Fats in foods of animal origin such as some fish, meat and dairy products	Can be toxic to the nervous and immune systems; can interfere with endocrine (hormone) system	TDI=0.01 mg/Kg BW/day	<ul style="list-style-type: none"> <li>Choose lower fat foods</li> <li>Wash fruits and vegetables before eating</li> </ul>
Polybrominated diphenyl ethers (PBDEs)	Flame retardant; added to some plastics, electrical and electronic equipment, upholstered furniture, non-clothing textiles and foam products		Air; water; indoor dust; animal fat	May cause problems with thyroid hormone and memory; permanent learning damage; hearing problems; delayed puberty; decreased sperm count; birth defects; possibly cancer	no guideline level for PBDE from Health Canada	<ul style="list-style-type: none"> <li>Choose lower fat foods</li> <li>Dust regularly in the home</li> </ul>
Dioxins and furans	Emissions from large-scale waste incinerators and small-scale burning of plastics, diesel fuel, and treated wood; a product of cigarette smoke		Meat, milk, dairy, eggs and fish	Can inhibit the immune system of animals and humans; likely causes cancer	TDI=2.3 pg/Kg BW/day	<ul style="list-style-type: none"> <li>Choose lower fat foods</li> <li>Avoid smoking or exposure to cigarette smoke</li> <li>Avoid burning garbage</li> </ul>

Name of POP	Where are they used?	Example of use	Where are they found?	Potential harmful effects	Guideline levels	How to minimize exposure
Polycyclic aromatic hydrocarbon (PAHs)	Comes from the incomplete burning of many substances		Air; contaminated water; grilled or charred meats	Can damage lungs, liver, kidneys and skin of humans; can damage red blood cells and weaken the immune system	MAC=0.01 µg/L Benzo[a]pyrene (a PAH) in drinking water	<ul style="list-style-type: none"> <li>• Avoid smoking or exposure to cigarette smoke</li> <li>• Avoid eating charred parts of grilled food</li> </ul>
Perfluorinated compounds (PFCs)	Used to make materials stain and stick resistant		Grease-resistant food packaging and paper products, such as microwave popcorn bags and pizza boxes; Scotchguard treated carpet, furniture, and clothing; Teflon coated cookware; shampoo; dental floss; denture cleaners; Gore-Tex clothing	May cause birth defects and affect fertility	no guideline level for PFCs from Health Canada	<ul style="list-style-type: none"> <li>• Avoid treated carpet and furniture, non-stick cookware (especially if scratched), microwave popcorn</li> </ul>

**Table A.2. Metals**

Metal	Example of use	Where is it found?	Potential harmful effects	Guideline levels	How to minimize Exposure
Cadmium		Cigarette smoke; shellfish; large mammal liver and kidneys; air near a waste incinerator; batteries; PVC plastic; metal coatings	May cause kidney and lung damage, fragile bones and cancers	drinking water guideline for Cd is 0.005 mg/L;  TDI=0.008 mg/kg BW/day	<ul style="list-style-type: none"> <li>• Avoid smoking or exposure to cigarette smoke</li> <li>• Avoid eating large amounts of land mammal organ meats such as liver and kidney</li> </ul>
Lead		Some airplane fuel; paint; pipes; lead shot ammunition; car batteries; toys; solder; PVC plastic	May cause problems with nervous and reproductive systems; anemia; impaired intelligence in young children (who are especially sensitive to lead)	drinking water guideline for lead is 0.01 mg/L;  No tolerable level	<ul style="list-style-type: none"> <li>• Avoid lead shot for hunting; use steel shot instead</li> <li>• Cut meat from around bullet area and discard</li> </ul>
Mercury		Thermometers; dental fillings; compact fluorescent lights; waste incineration; coal and fossil fuel burning; cement production; mining and smelting  A form of mercury called methyl mercury, is more harmful to people; found in some large, predatory fish (such as pike, walleye, lake trout, albacore) and shellfish	May cause brain, kidney and immune system damage; may affect vision, hearing and memory; women of childbearing age and children are most at risk	drinking water guideline for mercury is 0.001 mg/L;  pTWI for methylmercury= 1.6 µg/kg BW pTDI for inorganic mercury= 4 µg.kg BW TDI for methylmercury=0.47 mg/kg BW/day for adults and 0.2 µg/kg BW/day for women of child bearing age	<ul style="list-style-type: none"> <li>• Eat smaller walleye or northern pike</li> <li>• Choose small, non-fish eating fish such as whitefish, rainbow trout or yellow perch instead</li> </ul>
Arsenic		Found everywhere in low levels in air, food and water; also found in pressure treated wood, pesticides, cigarette smoke and coal burning facilities	Can irritate the throat and lungs; cause numbness in hands and feet, nausea and vomiting; can decrease production of blood cells; skin irritation; loss of movement; can increase the risk of skin, liver, bladder and lung cancer; can affect development in children	MAC in drinking water is 0.01 mg/L; oral slope factor for arsenic is 1.7 mg/Kg BW/day	<ul style="list-style-type: none"> <li>• Avoid smoking or exposure to cigarette smoke</li> </ul>

Reference: First Nations Food, Nutrition and Environment Study. Chemical Factsheets. 2012. Available Online: <[www.fnfnes.ca/download](http://www.fnfnes.ca/download)> Accessed 27 Apr 2012. TDI= Tolerable Daily Intake; pTWI=provisional Tolerable Weekly Intake; MAC=Maximum Allowable Concentration.

## Appendix B. Body Mass Index (BMI)

The Body Mass Index (BMI) uses a person's weight (in kilograms) and height (in metres) to calculate his or her risk of developing health problems.

$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height (m)} \times \text{height (m)}}$$

### Categories of BMI and Health Risk

BMI	Classification	Risk of developing health problems
< 18.5	Underweight	Increased
18.5 - 24.9	Normal Weight	Least
25.0 - 29.9	Overweight	Increased
30.0 - 34.9	Obese class I	High
35.0 - 39.9	Obese class II	Very high
>= 40.0	Obese class III	Extremely high

Notes: The BMI is not used for pregnant or lactating women. These BMI categories are not used for children less than 18 years of age. For people aged 65 and over, the "normal weight" classification may range from a BMI of 18.5 to 29.9. Other factors such as lifestyle habits, fitness level and the presence or absence of other health risk conditions need to be taken into consideration to determine an individual's risk. Source: Health Canada. Canadian Guidelines for Body Weight Classification in Adults. Ottawa: Minister of Public Works and Government Services Canada; 2003. Available from: [http://www.hc-sc.gc.ca/fn-an/nutrition/weights-poids/guide-ld-adult/bmi\\_chart\\_java-graph\\_imc\\_java-eng.php](http://www.hc-sc.gc.ca/fn-an/nutrition/weights-poids/guide-ld-adult/bmi_chart_java-graph_imc_java-eng.php)

## How to calculate your BMI

**Step 1:** Determine your weight in kilograms.

To convert weight from pounds to kilograms, divide by **2.2**:

$$\frac{\text{weight (pounds)}}{2.2} = \text{weight (kg)}$$

**Step 2:** Determine your height in metres.

To convert height from feet and inches to metres:

- Multiply height in feet times **12** to get height in **inches**
- Add any **additional height** in inches to the value obtained in a)
- Multiply value in b) times **0.0254** to get height in **metres**

**Step 3:** Take your weight in kilograms (value from Step 1) and divide by your height in metres (value from Step 2) squared.

$$\frac{\text{weight (kg)}}{\text{height (m}^2\text{)}} = \text{BMI}$$

**Step 4:** Compare your BMI to the classification chart to determine your health risk.



**Example:** Let's calculate the BMI of someone who weighs 160 pounds and is 5'8" tall:

**Step 1:**

To convert from pounds to kilograms, divide by 2.2:

$$\frac{160 \text{ pounds}}{2.2} = 72.7 \text{ kg}$$

**Step 2:**

To convert height from 5'8" to metres:

- multiply 5 feet x 12 inches per foot= 60 inches
- 60 + 8 inches= 68 inches
- 68 x 0.0254= 1.73 metres

So 5 feet 8 inches = 1.73 metres

**Step 3:**

$$\frac{72.7 \text{ kg}}{(1.73\text{m} \times 1.73\text{m})} = 24.3$$

**Step 4:**

According to the chart, a BMI of 24.3 falls within 18.5 - 24.9, the normal weight range that has the least risk to developing health problems.

## Appendix C. List of foods used to calculate the cost of a nutritious food basket

<p><b>Milk Products</b>  2% Milk (fresh)  Cheese, processed food, cheddar, slices  Cheese, mozzarella, partially skim, block, not slices  Cheese, cheddar, block, not slices, medium  Yogurt, fruit flavoured, 1% to 2% M.F.</p> <p><b>Eggs</b>  Grade A large eggs</p> <p><b>Meats, Poultry and Legumes</b>  chicken legs, no back  sliced ham (11%)  Beef, hip, inside round steak  beef, hip, inside (top) round roast  ground beef (lean)  canned baked beans in tomato sauce  peanuts, dry roasted  lentils, dry  peanut butter, smooth  pork chops (loin, centre cut), bone in</p> <p><b>Fish</b>  canned flaked light tuna, packed in water  frozen fish fillets, block (sole, haddock, pollock, halibut)  canned chum or pink salmon</p> <p><b>Orange vegetables and fruit</b>  peach, canned halves or slices juice pack  melon or cantaloupe, raw  sweet potato  carrots</p> <p><b>Dark green vegetables</b>  beans, snap, frozen  romaine lettuce  frozen mixed vegetables  broccoli  peas, green frozen  green peppers</p>	<p><b>Other vegetables and fruit</b>  apples, Macintosh  bananas  grapes, red or green  oranges  orange juice, frozen concentrate  pear  raisins, seedless  strawberry, frozen unsweetened  canned apple juice made from concentrate, unsweetened and vitamin C added  fresh potatoes  canned kernel corn (not creamed)  turnips, yellow (rutabaga)  cabbage  cucumber  celery  iceberg lettuce  mushroom, raw  onions, cooking  fresh tomatoes  canned whole tomatoes  vegetable juice cocktail</p> <p><b>Whole Grain products</b>  cereal, bran flakes with raisins  oatmeal, regular quick cooking  cereal, toasted oats Os  bread, pita, whole wheat  100% whole wheat bread, sliced  flour, whole wheat</p> <p><b>Non whole grain products</b>  social tea cookies  hot dog or hamburger buns (white)  crackers, saltine, unsalted top  enriched white bread, sliced  macaroni or spaghetti  flour, all purpose  long grain white rice</p> <p><b>Fats and oils</b>  canola oil  salad dressing, mayonnaise-type  salad dressing, italian  tub, margarine, non-hydrogenated</p>
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**Appendix D. Types of fruits and vegetables consumed from personal or community gardens in the Atlantic**

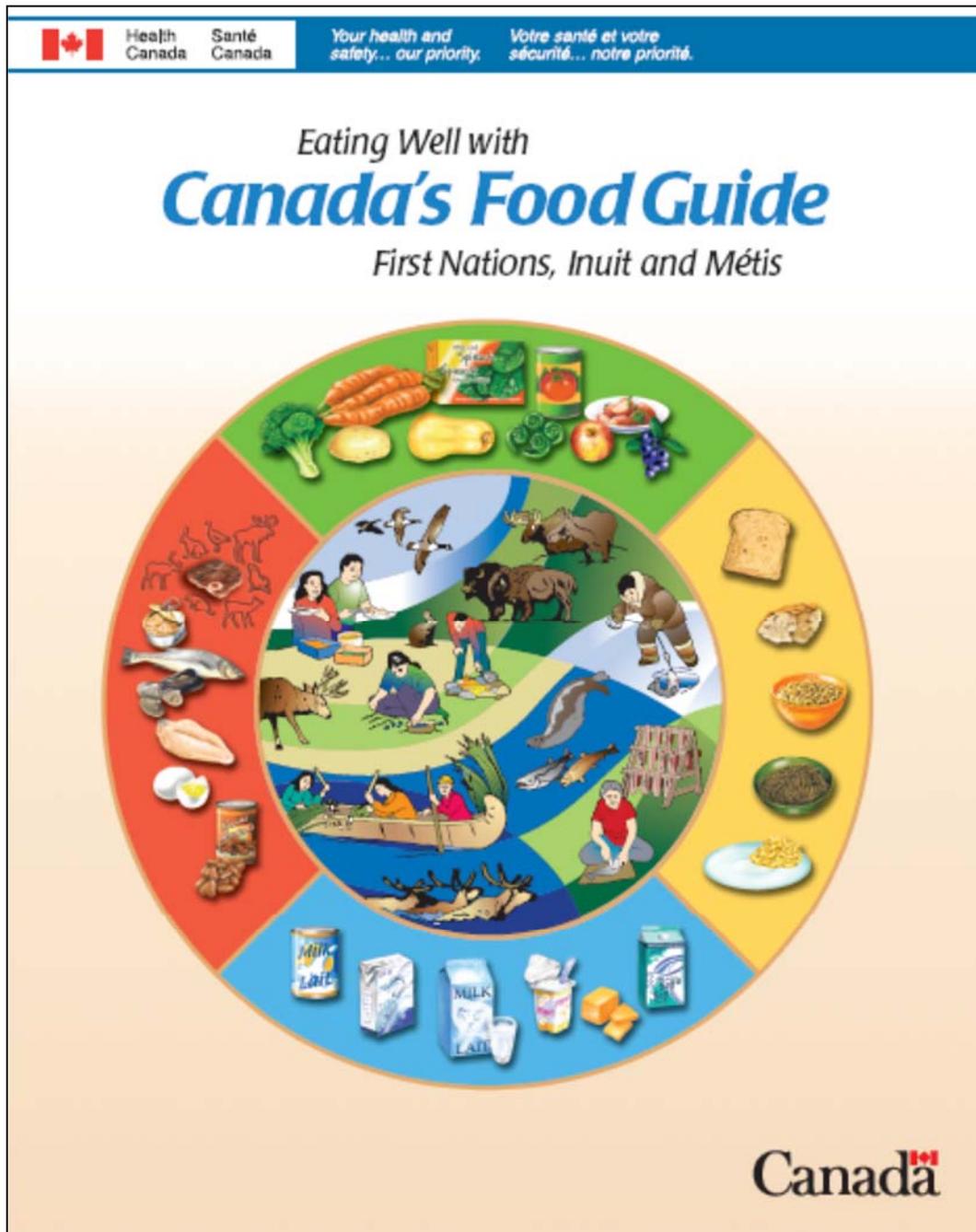
<b>Types of fruits and vegetables eaten from gardens</b>	<b>Percent of all fruits and vegetables reported (n=1381 responses)</b>
Cucumbers	14.05
Potatoes	13.11
Tomatoes	12.96
Carrots	11.37
Beans (green and yellow string beans)	8.83
Onions (scallions, chives)	4.49
Turnips (includes rutabaga)	4.34
Corn	3.69
Lettuce	3.55
Squash (includes pumpkin)	2.61
Berries (blueberries, strawberries, raspberries, blackberries, currants)	2.32
Peas (sweet, snap and snow peas)	2.32
Peppers (sweet bell and jalapeno)	1.96
Beets	1.96
Apples (includes crabapples)	1.59
Zucchini	1.45
Cabbage	1.30
Greens (kale, swiss chard, spinach)	1.30
Rhubarb	1.16
Herbs (mint, thyme, cilantro, oregano, parsley, rosemary, sage, savory, marjoram, basil, lemon balm)	1.01
Broccoli	0.80
Cherries	0.72
Garlic	0.58

Types of fruits and vegetables eaten from gardens	Percent of all fruits and vegetables reported (n=1381 responses)
Plums	0.51
Radishes	0.51
Cauliflower	0.29
Celery	0.25
Grapes	0.29
Cantaloupe	0.22
Parsnip	0.14
Pears	0.14
Eggplant	0.07
Pumpernickel	0.07
Echinacea	0.07

## Appendix E. Conversion of Grams to Usual Household Measures

Grams	Usual household measures	
5 grams	1 teaspoon	
10 grams	2 teaspoons	
15 grams	1 tablespoon	
30 grams	2 tablespoons	
60 grams	$\frac{1}{4}$ cup	
75 grams	$\frac{1}{3}$ cup	
125 grams	$\frac{1}{2}$ cup	
180 grams	$\frac{3}{4}$ cup	
250 grams	1 cup	
375 grams	1 $\frac{1}{2}$ cup	
500 grams	2 cups	

# Appendix F. Eating Well with Canada's Food Guide First Nations, Inuit and Métis



**How to use Canada's Food Guide**  
 The Food Guide shows how many servings to choose from each food group every day and how much food makes a serving.

Recommended Number of Food Guide Servings per day			
Children 2-3 years old	Children 4-13 years old	Teens and Adults (youth)	

Vegetables and Fruit fresh, frozen and canned.	4	5-6	7-8	7-10
Grain Products	3	4-6	6-7	7-8
Milk and Milk Alternatives	2	2-4	3-4 1 cup (250 mL) milk 2 cups (500 mL) milk alternatives	3-4 1 cup (250 mL) milk 2 cups (500 mL) milk alternatives
Meat and Alternatives	1	1-2	2	3

1. Find your age and sex (though in the chart below).
2. Follow down the column to the number of servings you need for each of the four food groups every day.
3. Look at the examples of the amount of food that counts as one serving. For instance, 125 mL (1/2 cup) of carrots is one serving in the vegetables and fruit food group.

- Eating Well Every Day**
- Canada's Food Guide describes healthy eating for Canadians two years of age or older. Choosing the amount and type of food recommended in Canada's food guide will help:
- children and teens grow and thrive
  - meet your needs for vitamins, minerals and other nutrients
  - lower your risk of obesity, Type 2 diabetes, heart disease, certain types of cancer and osteoporosis (weak and brittle bones)

**Eat at least one dark green and one orange vegetable each day. Choose vegetables and fruit prepared with little or no added fat, sugar or salt. Have vegetables and fruit more often than juice.**

**Make at least half of your grain products whole grain each day. Choose grain products that are lower in fat, sugar or salt.**

**Drink 600 mL (2 cups) of skim, 1% or 2% milk each day. Select lower fat milk alternatives. Drink fortified soy beverages if you do not drink milk.**

**How meat alternatives such as beans, lentils and tofu differ. Eat at least two Food Guide Servings of fish each week. Select lean meat and alternatives prepared with little or no added fat or salt.**

**When cooking or adding fat to food:**

- Most of the time, use vegetable oils with unsaturated fats. These include canola, olive and soybean oils.
- Aim for a small amount (2 to 3 tablespoons of about 30-45 mL) each day. This amount includes oil used for cooking, salad dressings, marinades and dressings.

**Health Canada provides advice for limiting exposure to mercury from certain types of fish. Refer to [www.healthCanada.gc.ca](http://www.healthCanada.gc.ca) for the latest information. Consult your provincial or territorial government for information about consumption limits.**

## Respect your body... Your choices matter

Following Canada's Food Guide and limiting foods and drinks which contain a lot of calories, fat, sugar or salt are important ways to respect your body. Examples of foods and drinks to limit are:

- pop
- fruit flavoured drinks
- sweet drinks made from crystals
- sports and energy drinks
- candy and chocolate
- cakes, pastries, doughnuts and muffins
- granola bars and cookies
- ice cream and frozen desserts
- potato chips
- nachos and other salty snacks
- french fries
- alcohol

### People who do not eat or drink milk products must plan carefully to make sure they get enough nutrients.

The traditional foods pictured here are examples of how people got, and continue to get, nutrients found in milk products. Since traditional foods are not eaten as much as in the past, people may not get these nutrients in the amounts needed for health.

People who do not eat or drink milk products need more individual advice from a health care provider.



### Women of childbearing age

All women who could become pregnant, and pregnant and breastfeeding women, need a multivitamin with **folic acid** every day. Pregnant women should make sure that their multivitamin also contains **iron**. A health care provider can help you find the multivitamin that is right for you.

When pregnant and breastfeeding, women need to eat a little more. They should include an extra 2 to 3 Food Guide Servings from any of the food groups each day.

For example:

- have dry meat or fish and a small piece of bannock for a snack, or
- have an extra slice of toast at breakfast and an extra piece of cheese at lunch.

### Women and men over the age of 50

The need for **vitamin D** increases after the age of 50.

In addition to following Canada's Food Guide, men and women over the age of 50 should take a daily vitamin D supplement of 10 µg (400 IU).

## For strong body, mind and spirit, be active every day.



This guide is based on *Eating Well with Canada's Food Guide*.

For more information, interactive tools or additional copies visit Canada's Food Guide at: [www.healthcanada.gc.ca/foodguide](http://www.healthcanada.gc.ca/foodguide)

or contact: Publications • Health Canada • Ottawa, Ontario K1A 0K9 • E-mail: [publications@hc-sc.gc.ca](mailto:publications@hc-sc.gc.ca) • Tel: 1-866-225-0709 • TTY: 1-800-267-1245 • Fax: (613) 941-5366

Également disponible en français sous le titre: Bien manger avec le Guide alimentaire canadien - Premières Nations, Inuit et Métis

This publication can be made available on request on diskette, large print, audio-cassette and braille.

## Appendix G. List of common foods and beverages avoided because of intolerance

Types of food reported to be avoided because of intolerance	% (out of 489 responses)
Milk and dairy products (includes milk, chocolate milk, cheese, ice cream, cream)	37.6
Greasy food	8.0
Spices and spicy foods	6.1
Meat (includes chicken, pork, moose, beef)	5.0
Vegetables (broccoli, cauliflower, celery, cucumbers, corn, potato, turnip, pepper, cabbage)	4.5
Caffeine (coffee/tea)	2.9
Bread	2.8
Fish/seafood	2.8
Eggs	2.6
Nuts/peanuts/seeds	2.6
Carbonated drinks	2.4
Fruits (apples, bananas, blueberries, grapefruits, grapes, oranges, pineapples, strawberries)	2.3
Tomatoes	2.3
Pasta	2.3
Fast food	2.1
Gluten/wheat	1.7
Gravy	1.5
Chocolate	1.4
Fruit juice	1.3
High acidic food	1.2
Tap water	0.9
Salt	0.8
Oatmeal	0.7
Flour	0.6
Onions/garlic	0.4
Sugar/sweets	0.4

Types of food reported to be avoided because of intolerance	% (out of 489 responses)
Mushroom	0.4
Oil/fat (margarine, vegetable oil)	0.45
Crepes	0.3
Alcohol	0.2
Foods high in fibre	0.2
Maple	0.2
Canned food	0.2
Rice	0.1
Pickles	0.1
Beans	0.1
Boiled foods	0.1
Mustard	0.1
Pancake syrup	0.1
Sugar substitute	0.1

**Appendix H. List of nutritional supplements taken by First Nations participants in the Atlantic**

<b>Types of supplements reported to be taken</b>	<b>% of all supplements reported (n=323)</b>
Multivitamin/Mineral Supplement	25.7
Vitamin D	12.4
Vitamin B (6, 12, Complex)	10.2
Vitamin C	7.4
Prenatal Supplement	6.8
Iron	6.4
Calcium	5.9
Omega/Fish Oil	5.9
Glucosamine	2.8
Protein Supplement	2.3
Weight Loss Product	2.2
Calcium with Vitamin D and/or Magnesium	1.9
Vitamin A	1.3
Vitamin E	1.3
Magnesium	1.1
Potassium	1.1
Fibre	0.9
Melatonin	0.9
Folic Acid	0.8
Co-Enzyme Q	0.5
Ginseng	0.5
Herbal Supplement	0.5
Spirulina	0.5
Iodine	0.3
Zinc	0.2
Garlic Pills	0.2

## Appendix I. Map of Surface Water Sampling Sites



- Site #1: Northwest Miramichi River (46.96418, -65.61459)
- Site #2: Northwest Miramichi River (46.96152, -65.62697)
- Site #3: Little Northwest Miramichi River (47.01399, -65.83776)

## Appendix J. Traditional Food Sample Harvest Locations

Traditional Food Description	Preparation Method	N	Harvest Location				
			Sample 1 Site	Sample 2 Site	Sample 3 Site	Sample 4 Site	Sample 5 Site
<b>SEAFOOD</b>							
Trout, speckled	raw	5	Miramichi River	Mullin Stream	Mullin Stream	Mullin Stream	Big Hole
Salmon	raw	3	Miramichi River	Red Bank	Big Hole		
Salmon	cooked	2	Miramichi River	Miramichi River			
Grilse (Atlantic salmon)	raw	4	Miramichi River	Miramichi River	Miramichi River	Miramichi River	
Smelt	raw	3	Miramichi River	Big Hole	Big Hole		
Striped bass	raw	3	Miramichi River	Big Hole	Big Hole		
Shad	raw	3	Miramichi River	Miramichi River	Miramichi River		
Sucker	raw	2	Miramichi River	Miramichi River			
Lobster, claw and tails	steamed	1	Point Sapin				
Lobster, claw and tails	raw	5	Point Sapin	Point Sapin	Point Sapin	Burnt Church	Shippegan
Crab legs	raw	2	Miramichi	Point Sapin			
<b>LAND ANIMALS</b>							
Moose meat	raw	3	Little Bold Mountain	Mullin Stream	Mullin Stream		
Moose meat	cooked	1	Mullin Stream				
Moose heart	raw	5	Little Bold Mountain	Mullin Stream	Mullin Stream	Mullin Stream	Mullin Stream
Moose liver	raw	3	Little Bold Mountain	Mullin Stream	Mullin Stream		
Moose nose	raw	3	Little Bold Mountain	Mullin Stream	Mullin Stream		
Moose tongue	raw	3	Little Bold Mountain	Mullin Stream	Mullin Stream		
Deer meat	raw	3	Eel Ground	Eel Ground	Eel Ground		
Squirrel meat	raw	2	Big Hole	Big Hole			
Rabbit meat	raw	3	Big Hole	Big Hole	Big Hole		
<b>BIRDS</b>							
Partridge (grouse)	raw	3	Eel Ground	Big Hole	Big Hole		
<b>WILD PLANTS/BERRIES</b>							
Blackberry	raw	2	Eel Ground	Burnt Church			
Blueberry	raw	5	Eel Ground	Eel Ground	Eel Ground	Big Hole	Big Hole
Cranberry	raw	3	Bay Du Vin	Eel Ground	Big Hole		
Crabapple	raw	4	Eel Ground	Eel Ground	Eel Ground	Eel Ground	
Raspberry	raw	3	Eel Ground	Eel Ground	Big Hole		
Fiddlehead	cooked	2	Red Bank	Eel Ground			

Fiddlehead	raw	3	Big Hole	Red Bank	Big Hole		
Dandelion tea, shoots	boiled	3	Big Hole	Big Hole	Big Hole		
Labrador tea leaves	boiled	3	Big Hole	Big Hole	Big Hole		
Raspberry leaves	boiled	3	Big Hole	Big Hole	Big Hole		
Yarrow shoot	boiled	2	Big Hole	Big Hole			
Wintergreen	Dried and boiled	4	Big Hole	Big Hole	Big Hole	Big Hole	
Teaberry leaves (wintergreen)	boiled	2	Big Hole	Big Hole			
Muskkrat root	raw	1	Big Hole				
Muskkrat rat (wihkes)	dried	2	Red Bank	Big Hole			
Oswego tea leaves (wild bergamot)	boiled	3	Big Hole	Big Hole	Big Hole		
<b>TREE FOODS</b>							
Balsam fir	frozen	1	n/a				
Yellow birch bark	boiled	3	Big Hole	Big Hole	Big Hole		
White cedar needles	boiled	2	Big Hole	Big Hole			
Hemlock bark	boiled	3	Big Hole	Big Hole	Big Hole		
Maple bark	boiled	3	Big Hole	Big Hole	Big Hole		
White pine cone	boiled		Big Hole	Big Hole	Big Hole		
Spruce	boiled	2	Big Hole	Big Hole			
Tamarack bark	boiled	3	Big Hole	Big Hole	Big Hole		
Hazelnut	dried	3	Big Hole	Big Hole	Big Hole		
<b>GARDEN FOODS</b>							
Rhubarb	frozen	3	Red Bank	Eel Ground	Eel Ground		
Corn kernels	dried	3	n/a	n/a	n/a		
Squash seeds	dried	3	n/a	n/a	n/a		
Sunflower seeds	dried	3	n/a	n/a	n/a		

**Appendix K. Top traditional foods eaten compared against those collected for contaminant analysis**

<b>Main traditional foods eaten</b>	<b>Collected for analysis Y/N</b>	<b>Sample size*</b>
Moose meat	N	-
Lobster	Y	5
Haddock	N	-
Corn/hominy	Y	3
Atlantic salmon	Y	10
Beans	N	-
Scallops	N	-
Shrimp	N	-
Cod	N	-
Fiddleheads	Y	5
Smelt	Y	3
Crab	Y	2
Bluefin tuna	N	-
Quahog clam	N	-
Soft clam	N	-
Deer meat	Y	3
Blueberry	Y	5
Brook trout	Y	5
Mussels	N	-
Wild strawberry	N	-
Striped bass	Y	3
Maple syrup	N	-
Wild raspberry	Y	3
Rainbow trout	N	-
Crabapple	Y	4
Halibut	N	-
Hazelnuts	Y	3
American plaice (sole)	N	-
Oysters	N	-
Lowbush cranberry	Y	3

\*Sample size is adequate if at least 5.

## Appendix L. What participants said about traditional food

"I always feel better when I eat traditional - feel it is better for us."

"Traditional food is healthy. I think it's great that we continue our traditional hunting/gathering."

"It's a sense of accomplishment when a man hunts for his family."

"I like everything about traditional food but like that it's our tradition and it's healthier."

"Traditional food makes you feel connected to your roots."

"Good for the brain, good for the body."

"It's good to live off the land."

"It's good, I love it."

"Pure, no chemicals, better for you."

"Just eat the food because it's good."

"I like the taste of it, it tastes more natural."

"Traditional food teaches kids the importance of gathering and preparing meals and food."

"Better for immune system."

"I love the taste of it, I like cooking with it."

"It is the healthiest source of food."

"Brings people together, tastes good."

"Teaches children how to provide for themselves."

"Good to pass onto younger generations."

"Interacting with community members."

"It's natural and not processed easier to digest."

"We were taught about traditional ways and we carry it and pass it on."

"It's important that future generations continue this and not forget how to hunt traditionally and prepare traditional foods."

## Appendix M. Healthy Food Guidelines for First Nation Community Events<sup>3</sup>

### *Guidelines for Communities*

Food is part of celebration, ceremony, social functions, learning functions and is one of our best ways to bring people together. With many opportunities to offer and share food, we have plenty of opportunity to promote healthy choices by ensuring that healthy foods are available almost all of the time.

Serving healthy foods in communities means having healthy food selections at all community activities that include food such as: community programs, gatherings, meetings and special events as well as at daycares and schools and even as part of fundraising events. Serving healthy foods starts with the types of food offered as well as the amount of food offered.

The following table of foods was based on the Guidelines for Food and Beverage Sales in British Columbia Schools and further adapted from a document created by the First Nations Health Council in BC. It has been modified for this report to assist communities in the promotion of healthy food choices at community events. The table is broken into Food Categories based on nutrition criteria that assess the calories and amount of sugar, fat and salt (sodium) in these foods. The first category, “Leave off the Table”, contains foods that are generally high in fat and sugar and/or salt. The second category, “Better on the Table”, includes foods that may be low in fat or salt (sodium) but do not meet all of the criteria of foods that fit within the third category, “Great on the Table Anytime”.

In order to promote healthy eating, we encourage communities to make and serve the types of foods listed under “**Better on the Table**” and “**Great on the Table Anytime**” as often as possible. Foods listed under “**Leave off the Table**” should be offered as little as possible or only at special occasions.



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<sup>3</sup> Adapted with permission from First Nations Health Council. 2009. Healthy Food Guidelines for First Nations Communities. The complete guidelines are available through the First Nations Health Council <http://www.fnhc.ca/> in their nutrition section.

Food Category	Leave off the Table	Better on the Table	Great on the Table Anytime
<b>Grains</b>			
<p>Grains must be the first or second ingredient (not counting water) Grain ingredients may include:</p> <ul style="list-style-type: none"> <li>- flours made from wheat, rye, rice, potato, soy, millet, etc.</li> <li>- rice, pasta, corn, amaranth, quinoa, etc</li> </ul> 	<ul style="list-style-type: none"> <li>• Flavoured or Instant rice</li> <li>• Fried Bannock, White bread, White buns</li> <li>• Baked goods and pastries (ex. Commercial muffins with a diameter more than 2 inches, cakes, cookies, danishes, croissant, cinnamon buns)</li> <li>• High fat crackers</li> <li>• Commercial or home-made pasta salads made with lots of dressing</li> <li>• Instant noodles (packages, cup) with seasoning mix</li> <li>• Microwave popcorn and fried snack foods e.g. Potato, tortilla chips</li> </ul>	<ul style="list-style-type: none"> <li>• White rice</li> <li>• Baked bannock, enriched breads, buns, bagels, tortillas, English muffins, pancakes, etc</li> <li>• Lower fat baked goods that are small in size (2 inch muffins, mini loaves</li> <li>• Low-fat crackers (no trans fat)</li> <li>• Pasta salads made with very little dressing</li> <li>• Other rice noodles</li> <li>• Trans-fat free, low-fat baked grain and corn snacks (baked tortilla chips, popcorn)</li> </ul>	<ul style="list-style-type: none"> <li>• Brown, wild or mix of brown &amp; white rice</li> <li>• Whole grain baked bannock, breads, buns, bagels, tortillas, English muffins, pancakes, etc</li> <li>• Some small baked lower fat items with whole grains, fibre, fruit or nuts, such as loaves, muffins</li> <li>• Low-fat whole grain crackers</li> <li>• Most whole grain pastas</li> <li>• Whole grain and corn snacks (cereal mix, tortilla chips, hot air popcorn with no butter)</li> </ul>
<p>Note: Foods high in starches and sugars (natural or added) can remain stuck on teeth and put dental health at risk. Grain food choices of concern are sugary cereals, granola and granola bars, crackers, cookies and chips (corn, wheat, rice, etc). The Canadian Dental Association suggests eating these foods only at mealtimes and not as a snack.</p>			

Food Category:	Leave off the Table	Better on the Table	Great on the Table Anytime
<b>Vegetables &amp; Fruit</b>			
<p>A vegetable or fruit or fruit puree must be the first or second ingredient, not counting water</p> 	<ul style="list-style-type: none"> <li>• Raw, canned or cooked fresh/frozen fruits and vegetables served with condiments or add-ins that don't meet Better on the Community Table/Great on the Table Anytime criteria (ex. Fruit in heavy syrup, most canned vegetables)</li> <li>• Fruit with a sugar based coating (e.g., yogurt- or chocolate-covered raisins)</li> <li>• Dried fruit (e.g., fruit roll-ups/leathers/chips) or fruit juice snacks (e.g., gummies)</li> <li>• Regular potato/vegetable chips</li> <li>• Coated/breaded and deep fried vegetables (e.g., French-fried potatoes, onion rings)</li> <li>• High Salt (sodium) Pickles (see Condiments)</li> </ul>	<ul style="list-style-type: none"> <li>• Raw, canned or cooked fresh/frozen fruits and vegetables (including wild greens and berries) that are cooked or prepared with low salt, low-fat sauces (e.g, low-fat milk-based) or meet Better on the Table Criteria (ex. Fruit in light syrup, low sodium canned vegetables)</li> <li>• Some sweetened baked fruit slices</li> <li>• Low-salt, baked potato/vegetable chips</li> <li>• Low salt (sodium) pickles</li> </ul>	<ul style="list-style-type: none"> <li>• Raw, canned or cooked fresh/frozen berries, fruit and vegetables (including wild greens and berries) that are served plain or with the minimum amount of dressing/serving recommended in the Condiment Section</li> <li>• Homemade salsa with fresh tomatoes or canned diced tomatoes and minimal salt</li> </ul>
<p>Note: Foods high in sugars and starches (natural or added) can leave particles clinging to teeth and put dental health at risk. Vegetable/fruit choices of concern include fruit leathers, dried fruit, and chips (potato or other).</p>			

Food Category:	Leave off the Table	Better on the Table	Great on the Table Anytime
<b>Vegetable &amp; Fruit Juices</b>			
<p>A vegetable or fruit juice or puree must be the first ingredient (not counting water):</p> <ul style="list-style-type: none"> <li>-may be diluted with water or carbonated water</li> <li>-may have added food ingredients, e.g. Fruit pulp, fruit puree</li> <li>-may not be fortified with vitamins other than Vitamin C, or with minerals other than calcium.</li> </ul> 	<ul style="list-style-type: none"> <li>• Most “drinks”, “blends”, “cocktails”, “splashes” and “beverages” (if sweetened with added sugars)</li> <li>• Most regular tomato and vegetable juices</li> <li>• Fruit smoothies made with leave off the community table ingredients</li> <li>• Slushy drinks and frozen treats (e.g., frozen fruit juice bars) with added sugars (note that concentrated fruit juice is considered an added sugar when it is not preceded by water in the ingredient list)</li> <li>• Juice drinks with added caffeine, guarana or yerba</li> </ul>	<ul style="list-style-type: none"> <li>• 100% fruit juice</li> <li>• 100% fruit + vegetable juices</li> <li>• Some lower-sodium tomato and vegetable juices</li> <li>• Fruit smoothies made with better and great on the table ingredients</li> <li>• Slushy drinks and frozen treats (e.g., frozen fruit juice bars) with no added sugars</li> <li>• Diluted or sparkly juice drinks, no added sugars</li> </ul>	<ul style="list-style-type: none"> <li>• Natural berry juices with water but no added sugar</li> </ul>
<p>Note: 100% juice and other fruit-flavoured drinks contain sugars and acids (natural or added) that dissolve tooth enamel when sipped frequently. To avoid prolonged exposure to these sugars and acids, choose plain water over fruit juice.</p>			

Food Category:	Leave off the Table	Better on the Table	Great on the Table Anytime
<b>Milk-based and Calcium Containing Foods</b>			
<p>For milk-based foods, milk must be the first ingredient; cream is NOT considered a milk ingredient</p> 	<ul style="list-style-type: none"> <li>• Candy flavoured ice creams, sundaes and many frozen yogurts</li> <li>• Frozen 'yogurt' not based on milk ingredients (see "Candies, Chocolates, etc" food grouping)</li> <li>• Most ice milks, ice creams, and frozen novelties</li> <li>• Some puddings/custards</li> <li>• Some higher fat cheeses</li> <li>• Most cream cheese and light cream cheeses and spreads (see condiment section)</li> <li>• Most processed cheese slices and spreads made without milk</li> <li>• Whole fat cottage cheese</li> </ul>	<ul style="list-style-type: none"> <li>• Small portions of some ice milks and frozen yogurts – simply flavoured</li> <li>• Small portions of sherbet</li> <li>• Puddings/custards made with low fat milk and limited added sugar</li> <li>• Pudding/custards/ice milk bars with artificial sweeteners (not for young kids)</li> <li>• Most flavoured yogurts</li> <li>• Yogurt with artificial sweeteners</li> <li>• Processed cheese slices made with milk</li> <li>• 1-2% milk fat cottage cheese</li> </ul>	<ul style="list-style-type: none"> <li>• Low fat, low sugar flavoured yogurts</li> <li>• Plain yogurt (low-fat)</li> <li>• Most regular and reduced fat or light cheeses, cheese strings (unprocessed)</li> <li>• Low-sodium cottage cheese (1% milk fat.)</li> <li>• Canned salmon with bones</li> </ul>
Note: Individuals who do not eat or drink milk products should seek advice from a health care provider.			
<b>Milk &amp; Calcium Containing Beverages</b>			
<p>Milk must be the first ingredient; cream is NOT considered a milk ingredient.</p> <p>Fortified soy drinks contain protein and calcium and are included in this food grouping.</p> 	<ul style="list-style-type: none"> <li>• Most candy flavoured milks</li> <li>• Most eggnogs</li> <li>• Most hot chocolate mixes made with water (see also "Other Beverages")</li> <li>• Smoothies made with Leave off the Community Table ingredients</li> <li>• Some blended sweetened regular and decaf coffee drinks</li> </ul>	<ul style="list-style-type: none"> <li>• Most basic flavoured milks and fortified soy drinks</li> <li>• Yogurt drinks</li> <li>• Some eggnogs if lower in sugar</li> <li>• Most hot chocolates made with milk</li> <li>• Smoothies made with Better on the Community Table ingredients</li> </ul>	<ul style="list-style-type: none"> <li>• Plain, unflavoured fortified soy and rice drinks</li> <li>• Skim, 1% and 2% milk</li> <li>• Some hot chocolates made with milk and very little added sugar</li> <li>• Smoothies made with ingredients from the "Great on the Table Anytime" list</li> <li>• Decaffeinated, unsweetened tea/coffee latté</li> </ul>
Note: Whole milk (3.25%) is recommended for children less than 2 years of age. Lower fat milks are suitable for children older than 2 years of age. Individuals who do not eat or drink milk products should seek advice from a health care provider.			

Food Category	Leave off the Table	Better on the Table	Great on the Table Anytime
<b>Meat &amp; Alternatives</b>			
<p>A meat or meat alternative must be the first or second ingredient (excluding nuts and seeds*). Meat and meat alternatives include: beef, pork, poultry, fish, game meats, eggs, soybeans, legumes, tofu.</p> <p>*See the “Nuts &amp; Seed Mixes or Bars” category for guidelines on these items</p> 	<ul style="list-style-type: none"> <li>• Many products deep fried in hydrogenated or partially hydrogenated oils or in vegetable shortening</li> <li>• Marbled or fatty meats</li> <li>• Many cold cuts and deli meats (deli chicken, deli beef, pepperoni, bologna, salami, etc) if high in salt or contain nitrates</li> <li>• Canned meats (Kam, Klik, corned beef, ham, etc)</li> <li>• Some seasoned chicken or tuna salads</li> <li>• Most regular wieners, sausages, smokies, bratwurst</li> <li>• Most pepperoni/chicken sticks</li> <li>• Some jerky</li> <li>• Bacon</li> </ul>	<ul style="list-style-type: none"> <li>• Some breaded and baked chicken/fish/meat</li> <li>• Some marinated poultry</li> <li>• Some fish canned in oil</li> <li>• Some deli meats if not too salty</li> <li>• Some chicken or tuna salads, lightly seasoned</li> <li>• Some lean wieners, sausages</li> <li>• Lean pepperoni/chicken sticks</li> <li>• Some jerky, lightly seasoned</li> <li>• Some egg salads, lightly seasoned</li> <li>• Legume salads, lightly seasoned</li> <li>• Some refried beans</li> </ul>	<ul style="list-style-type: none"> <li>• Chicken, turkey</li> <li>• Fish, seafood, fresh or canned in water/broth</li> <li>• Lean meat (beef, bison, pork, lamb)</li> <li>• Game meats and birds (moose, caribou, duck, etc)</li> <li>• Eggs</li> <li>• Tofu</li> <li>• Chicken salads if lower salt and fat</li> <li>• Lean wieners if lower salt</li> <li>• Jerky (plain)</li> <li>• Beans, peas, lentils</li> <li>• Most legume salads if lower salt</li> <li>• Refried beans (lower fat)</li> </ul>
<p>Note: Many processed meats are high in saturated fat, salt and nitrates. Choose non-processed, lean meat, poultry or fish instead. Wild game meats and fish are lower in saturated fat and contain no added salt or nitrates.</p>			
<b>Nuts &amp; Seeds (Mixes or Bars)</b>			
<p>Peanuts, nuts or seeds must be the first or second ingredient.</p> 	<ul style="list-style-type: none"> <li>• Nuts with a sugar based coating (eg. Chocolate, yogurt covered nuts)</li> <li>• Salty or sugary nut/seed bars and mixes (e.g. sesame snap bars)</li> <li>• Nuts/seeds that are highly salted or flavoured and roasted in additional oil</li> </ul>	<ul style="list-style-type: none"> <li>• Nuts/seed bars and mixes with nuts/seeds or fruit as the first ingredient and no sugar based coatings</li> </ul>	<ul style="list-style-type: none"> <li>• Nut/seed bars and mixes with nuts/seeds or fruit as first ingredient</li> <li>• Nuts/seeds, natural or dry roasted</li> </ul>

Food Category:	Leave off the Table	Better on the Table	Great on the Table Anytime
<b>Mixed Entrée Foods</b>			
<p>Note: Some trans fats occur naturally in meats like beef, lamb, goat, deer, moose, elk, and buffalo. Naturally occurring trans fats are considered healthy.</p> 	<ul style="list-style-type: none"> <li>• Sandwiches with deli or processed meats</li> <li>• Subway style sandwiches greater than 6 inches</li> <li>• Some pizzas (4 cheese/double cheese, meat lover)</li> <li>• Pizza pockets</li> <li>• Meat pot pies</li> <li>• Sausage/vegetable rolls</li> <li>• Pasta with a cream based sauce</li> </ul>	<ul style="list-style-type: none"> <li>• Most sandwiches</li> <li>• Short (e.g. 6 inch) submarine sandwiches, and burgers made with lean roasted meats (turkey, chicken, beef), but few vegetables</li> <li>• Whole wheat pizza topped with lean meat and vegetables and lightly topped with cheese</li> <li>• Baked pizza pockets, pizza pretzels, pizza bagels</li> <li>• Some curries, moderately salted</li> <li>• Stir fries prepared with low sodium sauces</li> <li>• Sushi</li> <li>• Pilaf (rice and meat)</li> <li>• Pasta with milk or vegetable based sauce</li> <li>• Hard tacos with meat or bean filling</li> </ul>	<ul style="list-style-type: none"> <li>• Sandwiches, short (6 inch) submarine sandwiches, and burgers made with whole grain breads and lean meats (turkey, chicken, beef) and plenty of vegetables and whole grain bread/buns</li> <li>• Whole wheat pizzas with vegetables</li> <li>• Stews, chillies, curries (lower sodium)</li> <li>• Stir fries on rice, if sauce is low in sodium</li> <li>• Pilaf (with vegetables)</li> <li>• Pasta with vegetable and meat based sauce</li> <li>• Burritos (bean or meat)</li> <li>• Soft tacos filled with “Great on the Table” ingredients</li> <li>• Some low sodium frozen entrees</li> </ul>
<b>Candies, Chocolates</b>			
	<ul style="list-style-type: none"> <li>• Most regular packages</li> <li>• Most very small packages of candies/chocolates</li> <li>• Very small portions of dessert gelatins</li> </ul>	<ul style="list-style-type: none"> <li>• Sugar-free gum or mints or cough drops</li> <li>• Diabetic candies (adults only)</li> </ul>	None

Food Category	Leave off the Table	Better on the Table	Great on the Table Anytime
<b>Soups</b>			
Includes dry, canned and fresh 	<ul style="list-style-type: none"> <li>• Some instant soups, plain or seasoned</li> <li>• Regular canned soups, broth or milk based</li> <li>• Many canned soups, broth or milk based</li> <li>• Ramen noodles</li> </ul>	<ul style="list-style-type: none"> <li>• Home-made soups made with soup bouillon/stock and other ingredients from the “Great on the Table Anytime” list</li> <li>• Hamburger soup made with regular fat meat</li> <li>• Some low-sodium canned or instant soups</li> </ul>	<ul style="list-style-type: none"> <li>• Home-made soups made without soup bouillon/stock</li> <li>• Hamburger soup made with lean meat (lean ground beef, moose or deer meat)</li> <li>• Some soups made with meat or beans/lentils</li> <li>• Some low-sodium canned or instant soups made with meat or beans/lentils</li> </ul>
<b>Other Beverages* (Non-Juice/Non-Milk based)</b>			
	<ul style="list-style-type: none"> <li>• Most drinks with sugars as the first ingredient (not counting water) – e.g. iced teas, fruit ‘aides’, pops</li> <li>• Most sport drinks*</li> <li>• Most hot chocolate mixes made with water</li> </ul>	<ul style="list-style-type: none"> <li>• Water (flavoured or not) minimally sweetened</li> <li>• Soda water **</li> <li>• Diet decaffeinated soft drinks and diet non-carbonated drinks (Secondary schools only)</li> <li>• Decaffeinated tea</li> <li>• Decaffeinated coffee</li> </ul>	<ul style="list-style-type: none"> <li>• Water, plain</li> <li>• Lemon/lime water</li> <li>• Soda water **</li> <li>• Sparkling/carbonated water or water with added flavours (no added sugar and/or no artificial sweeteners)</li> <li>• Labrador Tea</li> <li>• Fruit/mint flavoured unsweetened teas</li> </ul>
<p>*Sport/electrolyte drinks containing added sugars are not recommended. These beverages may be useful during sports events lasting more than 1 hour on hot days. Plain water is the best beverage when exercising.</p> <p>*Other Beverages may provide excess calories, caffeine, artificial sweeteners, or acids and often displace healthier food/beverage choices. These beverages often contain acids (natural or added) that may dissolve tooth enamel when sipped frequently. To reduce risk of damage to tooth enamel, choose water most often as a beverage.</p> <p>Limit portion sizes of “Other Beverages” (except plain water) to: 250 mL or less per serving for children (aged 5-12) and 360 mL or less for children aged 12 and older.</p> <p>**If serving soda water, check the sodium content as some brands may have higher levels.</p>			

Food Category	Use in Moderation	Generally No Limits
<b>Condiments &amp; Add-Ins</b>		
	<ul style="list-style-type: none"> <li>• Soy sauce: ½ teaspoon (2 - 3 mL)</li> <li>• Hot sauce: 5 - 10 mL</li> <li>• Table salt: ¼ - ½ mL</li> <li>• Soft margarine, butter: 5 - 10 mL</li> <li>• Cream: 5 - 15 mL Whipped Cream (from cream): 15 - 30 mL</li> <li>• Regular/light cream cheese or processed cheese spread: 5 - 15 mL</li> <li>• Regular sour cream: 15 - 30 mL</li> <li>• Low-fat sour cream: 15 – 45 mL</li> <li>• Fat-free sour cream: 15 – 60 mL</li> <li>• Low-fat/fat-free dips, dressings, spreads (e.g., mayonnaise, miracle whip, sandwich spread): 5 - 15 mL</li> <li>• Regular dips, dressings, spreads: 5 - 10 mL</li> <li>• Oil for sautéing or dressing (e.g., homemade vinegar and oil): 5 - 10 mL</li> <li>• Ketchup, mustard, relishes: 10 - 15 mL</li> <li>• Pickles (regular): 10-15 ml (Low sodium pickles: no limit)</li> <li>• Horseradish: 10 - 45 mL</li> <li>• Jarred salsa, sauerkraut: 10 - 30 mL (fresh salsa can fit into the Vegetables and Fruit food grouping)</li> <li>• Salad toppers (e.g. Bacon bits): 5 - 10 mL Croutons: 25 - 50 mL</li> <li>• Sugars, honey, jams/jellies, molasses, syrups (e.g., pancake): 15 mL</li> <li>• Flavoured syrups (e.g. for lattes): 1 pump (10 mL)</li> </ul>	<ul style="list-style-type: none"> <li>• Herbs and salt-free seasonings, garlic, pepper, lemon juice, Mrs. Dash</li> </ul>
<p>Condiments and add-ins can be used to enhance the flavour of Better on the Table and Great on the Table Anytime items. Condiments and add-ins should be served on the side whenever possible.</p>		