



**ACCESS TO
A NUTRITIOUS FOOD BASKET
IN EYYOU ISTCHEE**

Project Report

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ACCESS TO A NUTRITIOUS FOOD BASKET IN EYYOU ISTCHEE

SUMMARY

Food insecurity occurs when people cannot – or are uncertain of being able to – acquire quality foods in a socially acceptable manner and in sufficient quantity. It is associated with various health impairments and may be caused by insufficient income as well as lack of availability of quality food.

The Montreal Diet Dispensary (MDD) publishes a Nutritious Food Basket (NFB) three times a year since the early 1950's. In the last decade, various Quebec public health organizations, as part of their food security program, have commissioned the MDD to conduct studies on the cost and accessibility of the NFB in their respective regions.

As food insecurity is present in approximately one out of four Eeyouch[⊕], the "ACCESS TO A NUTRITIOUS FOOD BASKET IN EYYOU ISTCHEE" project was planned in the context of health promotion and prevention of chronic diseases.

Objectives

The project aimed to establish the cost and availability of the NFB items in the stores of Eeyou Istchee and nearby urban centres in which the Eeyouch regularly purchase food.

Secondary objectives of the project were the following:

- establish the availability of the NFB items in the region;
- determine the cost per NFB category;
- determine the variation of the average minimal cost of the NFB according to store size and the urbanization and deprivation levels of their site;
- verify the expiration date of some of the NFB items.

In collaboration with the nutritionists working in Eeyou Istchee, the MDD adapted the content of the NFB with suitable substitutes as unavailability of some of the items was expected. A training session on price tallying was held. The MDD also planned data treatment and analysis for the project, including economical data. The nutritionists contacted the stores managers to obtain their participation in the project and were responsible for price tallying.

Price tallying was held in 16 stores of Eeyou Istchee, 5 of *Jamésie* and 3 of Abitibi, in September 2011, during the week of the 26 to the 30.

From the data collected, the following results were obtained

⊕ Refers to residents of Eeyou Istchee, James Bay Cree Territory, Quebec.

In the Stores of Eeyou Istchee

Availability of the NFB Items[Ⓢ]

Out of the 71 NFB items, the number that were 'truly missing'[Ⓢ] per community ranged in more or less a similar pattern in the inland and coastal communities: between 2 and 14 items missing. On the other hand, when percentages of items missing were considered, it was twice as high in inland communities compared to coastal ones (31.2% vs 16.8%). Expiration date was surveyed for milk, eggs, cheese and bread; none of these items were expired.

Cost of the NFB Categories

The general trend was higher costs in coastal compared to inland communities.

Cost of the NFB per Group of Age, Sex and Physiological Condition

Weekly allowances for individuals are based on nutritional needs per age and sex and the cost of the NFB varies accordingly. Pregnancy and lactation are physiological conditions in which the nutritional needs of women increase; accordingly, the cost of the NFB increases by \approx \$7 to \$10. And, comparing the cost of the additional needs for lactation to the price of infant formula established that breastfeeding represents a saving of at least \$30 per week.

Cost of the NFB

The average weekly cost of the NFB for the MDD reference family of 4 (a man and a woman 31 to 50 years old, a boy 14 to 18, and a girl 9 to 13) was \$312.47. The cost was higher in the coastal communities (\$338.71) than in the inland ones (\$268.73).

The average cost of the NFB for a larger family, more representative of Eeyouch families (a child 1 to 3 years old and a boy 4 to 8 in addition to the MDD reference family), was \$418.41.

Results According to the Independent Variables

Among the independent variables (store size, urbanization level, and deprivation index), only store size was shown to be related to the availability of the NFB items: the smallest stores had more items missing, compared to stores of larger size.

None of the independent variables influenced the cost of the NFB or the differences noted between the stores in the inland and coastal communities.

Cost of the NFB in the Economical Context of Families

To calculate the portion of the family budget required to purchase the NFB, the after-tax median family income was used.

The calculations were conducted for families with two children (MDD reference family) as well as for families with three or more children as the latter are more representative of Eeyouch families.

The results showed that, for average-income families comprising a couple, the proportion of family income required to purchase the NFB in Eeyou Istchee was 21% for families with two children, and 29% for families with three or more children. In comparison, it was:

- twice as high for average-income single-parent family;
- 2½ to 4 times as high for low-income families.

Thus, food security is jeopardized for these families.

[Ⓢ] Data excluding Oujé-Bougoumou where there was only a convenience store (41 NFB items missing).

[Ⓢ] The NFB item was not available in any of the stores in a community.

In the Stores of *Jamésie* and of Abitibi Urban Centres

Very few of the NFB items were missing in these stores. The cost of the NFB ranged from \$209.71 per week in one Abitibi store to an average of \$226.21 per week in *Jamésie*.

Comparing Eeyou Istchee and *Jamésie*

Cost of the NFB

The cost of the NFB was shown to be significantly higher (\$86.26 per week) in Eeyou Istchee compared to *Jamésie*. When this comparison differentiated coastal and inland communities in Eeyou Istchee, only coastal stores remained statistically more expensive compared to *Jamésie*, with a difference of \$112.50 per week.

Cost of the NFB in the Economical Context of Families

Eeyou Istchee residents frequently purchase food in *Jamésie* where the NFB is less expensive. Thus, a lower percent-of-income is needed to purchase the NFB in the stores in *Jamésie*. However the cost of transportation must be weighed against the potential savings (approximately \$110 per week for families in the coastal communities and \$40 per week for families in inland communities) to confirm that there is an overall cost savings to this practice.

Effect of the Deprivation Index

With the 21 stores combined, material deprivation was shown to significantly affect the cost of the NFB: it is higher (\$103.67 per week) in stores situated in areas with strong material deprivation compared to those with weak material deprivation.

Comparing the Cost of the NFB in Eeyou Istchee to Other Areas

The cost of the NFB in Eeyou Istchee is higher than any other studied Quebec regions.

Conclusion

In Eeyou Istchee, eating well is of concern for the average-income single-parent family while it appears to be out of reach for low-income families.

The food delivery system in Eeyou Istchee does not maximize healthy choices and community self-reliance. The cost of food is very high while choices are limited.

Long-term strategies towards ensuring food security are needed to prevent chronic diseases and promote health.

ACCESS TO A NUTRITIOUS FOOD BASKET IN EYYOU ISTCHEE

INTRODUCTION

The "ACCESS TO A NUTRITIOUS FOOD BASKET IN EYYOU ISTCHEE" project was planned in the context of health promotion and prevention of food insecurity for the population of Eeyou Istchee.

FOOD SECURITY, A DETERMINANT OF HEALTH

Sound nutrition is known to be part of a healthy lifestyle, but low income may cause food insecurity, defined as the inability to acquire sufficient quantity of quality foods, in a socially acceptable manner, or the uncertainty of being able to do so¹.

People affected by food insecurity are at risk of having a poor, or just fair, health status. Insufficient or poor quality dietary intake caused by food insecurity contributes to health problems in mothers and their offspring^{2,3} and may aggravate the situation of people already at risk of developing diabetes¹. Studies have also indicated an association between food insecurity and the incidence of obesity in preschool children^{4,5}

Food insecure people are prone to chronic diseases, such as heart conditions, diabetes, obesity, hypertension, and food allergies⁶. Food insecurity is more common among diabetics than among non-diabetics⁷. Food insecurity may also jeopardize the control of chronic diseases that require modifications of food habits: studies have indicated that adult diabetics in households affected by food insecurity needed medical attention more often than diabetic people from other households¹. Psychological, social and physical consequences are also associated with food insecurity: examples of such consequences are social exclusion and mental health problems such as anxiety and depression in children and adults⁶. Improving food security is therefore a primary prevention strategy to prevent chronic illnesses.

CONTEXT OF THE EYYOU ISTCHEE REGION

Health

In Eeyou Istchee, 17% of people 12 years and over deem themselves to be in "fair or poor" health. That proportion is significantly greater among people in the 65 and over (28%) and 45-64 age groups (24%), compared to the 20-29 (15%) and 12-19 (10%) age groups. A greater number of Eeyou Istchee residents deem themselves to be in "fair or poor" health compared to the rest of Quebec (17% vs. 11% respectively)⁸.

As of the end of 2011, one in five Cree aged 20 years or over had diabetes (22%) which is almost four times the rate of the Quebec population⁹.

Food Insecurity

In 2003, slightly more than one quarter (27%) of the adult population of Eeyou Istchee experienced food insecurity in the year preceding the survey, compared to nearly 15% of other Quebec residents¹⁰.

Food insecurity is less frequent among residents who have completed postsecondary studies (14%) compared to residents of lower educational level (32%). Food insecurity is more prevalent in households of six people or more (31%) than in households of three people or less (19%)¹⁰.

Between 1998 and 2000, one-fifth (20.8%) of mothers (of nine-month old babies) were anxious about the food supply¹¹.

In 2010, 14% of parents reported that their young child sometimes went hungry when the family was out of money for food. For about one out of four children who went hungry (i.e. 3-4 % of all children under six), this happened at least once a month¹².

Family Composition

Households in the region are larger than elsewhere in Quebec: 74% have four or more residents. More than a third (37%) of households in Eeyou Istchee are composed of six or more people. Furthermore, 71.8% of households are composed of a couple with children and 12.9% are single-parent families¹³.

Employment and Income

In 2003, 41% of the labour force was employed year round, and another 35% employed for part of the year. As for unemployment, there are noticeable variations by sub-region, the rate being significantly higher in the coastal communities than the inland ones (28% vs. 17%). People with some postsecondary education were more likely than those with a high school degree or less to be employed throughout the year (55% vs. 29%)¹³.

Data on the rates of low-income families are only available for the entire *Nord-du-Québec* region (comprising Eeyou Istchee, *Jamésie* and Kativik®). Between 2005 and 2006 the *Nord-du-Québec* was the only region in Quebec in which the rate of low-income increased; the rate among the entire population was 18.1%[Ⓢ] and among families, 16.5% in 2006¹⁴. In 2009, the rate of low-income was as follows:

- 5.6% in families comprising a couple with two children;
- 10.0% in families comprising a couple with three or more children;
- 40.5% in single-parent families with two children;
- 40.7% in single-parent families with three or more children¹⁵.

Cost of Food

In 1996, as part of a study conducted by Indian and Northern Affairs Canada, the weekly cost of the Northern food basket for a family of four was substantially higher in Waskaganish (\$214) than in Ottawa (\$125) and Kuujuaq (\$180)^{16,17}.

Whenever accessibility to healthy store-bought foods is discussed in Eeyou Istchee, the high cost and the lack of availability of these foods are often mentioned. Since the

Ⓢ Both Kativik and Nunavik occupy the territory above the 55th parallel of Quebec. Nunavik includes the Cree Whapmagoostui community while Kativik does not.

Ⓢ Including people not living within a family.

situation seems to greatly affect the food choices of the population, this project aims to assess the current situation of both food cost and availability in the region.

THE NUTRITIOUS FOOD BASKET OF THE MONTREAL DIET DISPENSARY

Since the early 1950's, the Montreal Diet Dispensary (MDD) publishes a Nutritious Food Basket (NFB). The basket satisfies, at minimal cost, the nutritional needs of individuals according to age, sex and physiological condition (pregnancy and lactation). Three times per year, pricing of the foods in the basket is undertaken in Verdun, representing disadvantaged neighbourhoods of Montreal¹⁸. In addition to its use in nutrition counselling, the NFB provides a tool in support of the population at risk of food insecurity.

The selection of the foods in the NFB of the MDD is based on the following criteria: the nutritive value and low cost, with consideration of consumer trends. For calculating the nutritive value of the food categories in the NFB, the MDD uses the food composition table published by the *Université de Montréal*¹⁹. When no data is available in this table, other sources are consulted^{20,21,22}. Calculation of the food basket considers the energy (kcal) and composition of protein, carbohydrate, total fat, saturated fatty acids, trans fatty acids, cholesterol, polyunsaturated fatty acids (omega-6: linoleic, and omega-3: α -linoleic, eicosapentaenoic, docosahexaenoic), minerals (calcium, phosphorus, iron, sodium, potassium, magnesium, zinc), vitamins (A, B₁, B₂, niacin or B₃, folic acid, pantothenic acid, B₆, B₁₂, C, D, E) and total fibre of food items.

In 2005, while developing an action plan for food security for the Island of Montreal, the *Direction de santé publique* (DSP) commissioned the MDD to conduct a study to determine if the NFB was accessible to all Montrealers, with particular interest given to economically disadvantaged people²³. Having established the average cost of the NFB at \$5.50 per person per day, the project showed that the cost of the NFB was 32% of the cost of the MDD "Minimum Adequate Standard of Living"²⁴, while in reality low-income households (less than \$22,000 per year) in Quebec spent only 21% of their income on food.

The results of the Montreal study prompted the Quebec *Ministère de la Santé et des Services sociaux* (MSSS) to commission the MDD in 2009 to undertake a study on the cost of the NFB in three regions of *Québec*. The report of this study conducted in 140 stores was published in October 2011²⁵. Results indicate that in the *Capitale-Nationale* and *Mauricie/Centre-du-Québec* regions the cost of the NFB is similar to Montreal, but higher in the *Côte-Nord* region.

THE "ACCESS TO A NUTRITIOUS FOOD BASKET IN EYYOU ISTCHEE" PROJECT

The project on "ACCESS TO A NUTRITIOUS FOOD BASKET IN EYYOU ISTCHEE" aimed to establish the cost and availability of the NFB items in the stores of Eeyou Istchee and nearby urban centres in which Eeyouch[⊕] regularly purchase food.

⊕ Refers to residents of Eeyou Istchee, James Bay Cree Territory, Quebec.

ACCESS TO A NUTRITIOUS FOOD BASKET IN EYYOU ISTCHEE

PROJECT DESCRIPTION

The first objective of the project was to:

- determine the average minimal cost of the NFB in the stores of Eeyou Istchee as well as in nearby urban centers in which the Eeyouch regularly purchase food.

The secondary objectives were to:

- determine the variation of the average minimal cost of the NFB according to store size and the urbanization and deprivation levels of their site;
- determine the cost per NFB category;
- establish the availability of the NFB items in the region;
- verify the expiration date of certain perishable food items of the NFB.

COMPONENTS OF THE PROJECT

The project was conducted by tallying prices of the NFB items in the food stores in Eeyou Istchee as well as nearby urban centres where the population regularly purchases food. The project was divided into three main components:

- planning;
- data collection;
- results.

Planning

Stores

A total of eighteen (18) food stores were identified in the Eeyou Istchee region (11 in the coastal area and 7 inland), six (6) in *Jamésie* and ten (10) in Abitibi urban centres. The Cree Board of Health and Social Services of James Bay (CBHSSSJB) nutritionists sent a letter to the managers of these stores and requested a written confirmation of their participation in the project (Appendix 1).

Description of the Region

A preliminary study of the region was necessary for the analysis of urbanization²⁶ and deprivation levels^{27,28,29,30}. In addition, data on the income situation of the Eeyou Istchee population was necessary to analyse the results in the context of household budgeting.

Analysis

In the project, planned independent variables were store size, urbanization level and deprivation index. An analysis expert and a statistician were available, on contract to process the results.

Standardization of the Materials

The data collection tools and training material previously used in other studies were revised in order to hold a one-day training session instead of a two-day one. These were the *Cahier de formation* (Appendix 2) and the price tallying form providing

information with regard to the format of the NFB items. As variations in the availability of the NFB items were expected, a list of acceptable substitutes was established in consultation with the CBHSSSJB nutritionists.

Training

A one-day training session was provided to the three CBHSSSJB nutritionists assigned to survey the stores for price and availability of NFB items. Training was provided via a conference call on September 13, 2011. The conference call was also an opportunity to discuss additional substitutes for the NFB items that might not be available. Following this discussion, the MDD established a specific Price Tallying Form (Appendix 3, in French) as well as a list of modifications (Appendix 4: *Modifications pour le relevé de prix Baie-James-Nord-du-Québec*).

Data Collection

Price Tallying

Price tallying was conducted on the last week of September 2011, in the 25 stores from which a written confirmation of participation (Appendix 1) had been received: 16 in Eeyou Istchee, 5 in *Jamésie* and 4 in Abitibi.

Data Entry

Electronic files for data entry, including particular data (e.g. item of a different size, missing information, etc.) were developed in consultation with the statistician and verified for accuracy.

Results

Analysis

Detailed description on how the data was handled for analysis is provided under "Methodology".

Report writing

The MDD team was responsible for writing this report, in collaboration with the CBHSSSJB nutritionists.

Dissemination of results and follow-up

The CBHSSSJB is responsible for the dissemination of the results and follow-up.

ACCESS TO A NUTRITIOUS FOOD BASKET IN EYYOU ISTCHEE

METHODOLOGY

The project on "ACCESS TO A NUTRITIOUS FOOD BASKET IN EYYOU ISTCHEE" is a descriptive portrait of the availability and cost of NFB items in stores in the Eeyou Istchee region (James Bay Cree territory), *Jamésie* as well as certain urban centers of Abitibi, where Eeyouch purchase food.

There are nine (9) Eeyou Istchee communities, five (5) of which are referred to as coastal communities as they are located along the James Bay and Hudson Bay coasts: Chisasibi, Wemindji, Waskaganish, Eastmain and Whapmagoostui (Kuujuaraapik). The remaining four (4) communities, Waswanipi, Nemaska, Oujé-Bougoumou and Mistissini, are located inland. Price tallying was conducted in 16 of the total 18 stores in these communities.

There are five urban centres in *Jamésie* and price tallying was conducted in five (5) out of the six (6) stores of that region.

In addition, price tallying was conducted in four (4) stores located in two (2) Abitibi urban centres where Eeyouch purchase food.

DATA TREATMENT

A verification of the tallied prices was conducted by the MDD. Any questionable or missing information (store size, NFB item weight, etc.) was verified with the CBHSSJB nutritionists.

When needed, items were coded according to the following specifications:

- food unavailable in store;
- missing data (e.g. weight of the product, expiration date);
- different size than specified;
- different product or different presentation than specified (frozen, for instance);
- questionable data (unusual weight, size, or price);
- product sold by unit (for which the price has to be adjusted to the specified weight).

NFB Items Unavailable in Stores

Unavailability of certain items was expected, and substitutes had been planned (Appendix 4). Nevertheless, unavailability of items still occurred and, because missing food items would artificially reduce the total cost of the food basket, a price had to be applied for these missing data. The following is the method used to estimate the cost of missing items:

- if the missing item was available in at least one other store within the same community, the median price of the item in the community was applied to the missing item;
- if the missing item was not available in the community but was available in other stores within the 16 stores of Eeyou Istchee, the median price of the item in these stores was applied to the missing item;

- if the missing item was not available in the 16 stores in Eeyou Istchee, the median price of the item from the *Jamésie* and Abitibi stores was applied to the missing item.

This methodology accounting for missing items can only be applied when a region is entirely represented. Therefore, it could not be applied to the Abitibi stores. Thus only three (3) of the Abitibi stores are considered in this report as one did not carry the NFB perishable items.

Different Foods than those Specified

In this project, suitable substitutes had been planned (Appendix 4) and were used when necessary. Because substitute items can impact overall cost of the NFB, each occurrence of substitution was noted (Appendix 5).

Calculation of the NFB Cost

As shown on Table 1, there are 71 items in the NFB[Ⓢ]. These items are classified into 22 food categories plus a **MISCELLANEOUS** one (items such as seasonings, beverages, etc.).

In each store, the cost and size of each of the 71 food items were used to calculate its cost per kg. The weighted cost per kg of the category was the sum of the cost per kg of each item, multiplied by its respective percentage.

For each group of age, sex and physiological condition, weekly food category allowances (Table 2) were established by the MDD in order to fulfill individual nutritional needs.

The weekly NFB cost for one individual was obtained by multiplying the weighted unit cost of each of the 22 food categories by the weekly food category allowance and adding 5% for the inevitable food loss that occurs in domestic use³¹. The cost per week of the NFB for a household was obtained by adding the weekly NFB cost for each person in the household.

The MDD establishes the cost of the NFB for a reference family of four, which is comprised of a man and a woman both between 31 and 50 years old, a boy 14 to 18 years old, and a girl 9 to 13 years old. The weekly cost of the NFB for this family is designed as the Cost of the NFB in this report unless otherwise specified. Divided by 28 (7 days per week and 4 people per family), this cost sets the average cost of the NFB per person per day.

For households of less than four people, the proportional cost of the NFB is increased in order to take into account the fact that the food formats used for price tallying are those that are suitable for a four-person household (i.e. bulk purchases). Thus, an increase of 5% for a three-person household, 10% for a two-person household, and 20% for a single person, is additionally applied to account for these food format differences³². On the contrary, larger households (five or more people) would benefit from larger bulk formats but, unfortunately, low-income families do not have enough money to take advantage of such purchases.

[Ⓢ] There are three types of milk in the NFB, but only one of these applies per group of age, sex and physiological condition. Therefore, there are 69 items per individual person in the NFB.

Table 1. Composition of the food categories in the NFB

CATEGORIES – Foods		CATEGORIES - Foods	
MILK fresh (three types)	100%	POTATO	100%
MEAT		OTHER VEGETABLES	
Beef, medium ground	19%	Carrots	20%
Beef, inside round	12%	Onions	10%
Beef, boneless stewing	7%	Celery	5%
Pork loin chops, with bone	14%	Spinach	5%
Boneless ham, quarter style	14%	Broccoli	10%
Chicken legs with back	34%	Lettuce, iceberg	5%
LIVER pork	100%	Turnip	5%
FISH		Green cabbage	5%
Sole fillets, frozen	50%	Tomatoes	5%
Tuna, light, flaked, canned	15%	Tomatoes, canned	10%
Salmon, pink, canned	35%	Tomato juice	3%
EGG , category A, large	100%	Tomato paste	2%
CHEESE		Green peas	2%
Process, slices	40%	Corn, whole kernels	5%
Cheddar, mild	30%	Mixed vegetables, frozen	8%
Mozzarella	30%	BREAD	
PEANUT BUTTER	100%	Whole wheat	85%
LEGUMES		Hot dog/hamburger buns	15%
Beans with pork, tomato sauce	20%	BREAKFAST CEREALS	
Red kidney beans, canned	15%	Shredded Wheat	20%
Chick peas, canned	15%	Bran Flakes	20%
Lentils, dry (12.5%)	50%	Oatmeal, quick	60%
White beans, dry (12.5%)		OTHER CEREAL PRODUCTS	
Red kidney beans, dry (12.5%)		Rice, long grain	30%
Split yellow peas, dry (12.5%)		Macaroni / spaghetti	30%
CITRUS FRUITS		Flour, all purpose	30%
Oranges	50%	Flour, whole wheat	10%
Orange juice, frozen	50%	BUTTER/MARGARINE	
OTHER FRUITS		Butter	50%
Apples	35%	Margarine	50%
Bananas	35%	OTHER FATS	
Grapes	5%	Mayonnaise (65% oil)	30%
Pears	10%	Vegetable oil (canola)	70%
Cantaloupe	5%	SUGAR	
Fruit salad/cocktail in own juice	5%	Sugar, white	75%
Raisins, bulk	5%	Sugar, brown	25%
FLAX SEED	100%	SWEETS	
INFANT FORMULA	100%	Strawberry jam	70%
BABY CEREAL , iron enriched	100%	Honey	20%
		Molasses	10%
		MISCELLANEOUS*	
		Adult / Child	

* Seasonings, baking powder, tea, coffee, cocoa, etc.

Table 2. Weekly food category allowances for each group of age (years), sex and physiological condition

Food categories	Unit*	Child		Males							Females							Pregnancy			Lactation		
		0,5 to 1	1 to 3	4 to 8	9 to 13	14 to 18	19 to 30	31 to 50	51 to 70	≥ 71	4 to 8	9 to 13	14 to 18	19 to 30	31 to 50	51 to 70	≥ 71	≤ 1 to 8	19 to 30	31 to 50	≤ 1 to 8	19 to 30	31 to 50
MILK	3.25% fat	Litre	—	5	—	—	—	—	—	—	—	—	—	—	—	—	—	7	7	7	7	7	7
	2% fat	Litre	—	—	6	7	7	6	5	—	—	6	7	7	5	5	—	—	—	—	—	—	—
	1% fat	Litre	—	—	—	—	—	—	—	5	5	—	—	—	—	5	5	—	—	—	—	—	—
MEAT	Kg	0.06	0.21	0.48	0.48	0.75	0.75	0.75	0.75	0.68	0.42	0.42	0.60	0.60	0.60	0.60	0.48	0.60	0.60	0.60	0.60	0.60	0.60
FISH	Kg	0.03	0.12	0.18	0.24	0.30	0.30	0.30	0.30	0.30	0.18	0.24	0.24	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
LIVER	Kg	0.01	0.03	0.06	0.09	0.09	0.09	0.09	0.09	0.09	0.06	0.09	0.09	0.09	0.09	0.09	0.06	0.09	0.09	0.09	0.09	0.09	0.09
EGG	unit	3 ^μ	3	3	4	7	7	4	4	3	3	4	4	4	3	3	3	7	7	7	7	7	7
CHEESE	g	60	60	120	120	210	180	150	150	120	90	120	150	150	150	120	120	150	150	150	150	150	150
PEANUT BUTTER	g	—	70	140	210	210	140	140	140	105	105	105	105	105	105	105	105	105	105	105	105	105	105
LEGUMES ^δ	g	—	60	100	180	240	240	200	200	200	100	150	150	200	200	200	200	200	200	200	200	200	200
CITRUS FRUIT	Kg	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
OTHER FRUIT	Kg	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
POTATO	Kg	0.25	0.5	1	1.5	2	1.75	1.75	1.5	1.25	1	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
VEGETABLES	Kg	0.5	1	1.5	2.5	2.5	2.5	2.5	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
BREAD	sl. ^β	1	14	21	35	42	35	35	28	28	21	28	21	21	21	21	21	35	28	28	28	28	28
BREAKFAST CEREALS	g	—	210	280	420	420	420	420	420	420	210	315	420	420	315	210	210	420	315	315	315	315	315
RICE/PASTA/FLOUR	g	30	105	210	315	630	630	630	630	525	210	315	315	525	525	420	315	420	420	315	420	420	315
BUTTER/MARGARINE	g	—	70	70	105	105	105	105	105	105	70	105	105	70	70	70	70	105	70	70	105	70	70
OTHER FATS	g	—	35	105	140	210	140	140	105	105	105	105	105	105	105	105	105	105	105	70	105	105	105
SUGAR	g	—	35	105	105	210	105	105	105	105	70	70	105	105	70	70	70	105	105	70	105	105	70
SWEETS	g	—	35	105	105	210	105	105	105	105	70	105	105	105	70	70	70	105	105	70	105	105	70
FLAXSEED	g	—	—	—	49	49	49	49	49	49	—	49	49	49	49	49	49	49	49	49	49	49	49
INFANT FORMULA ^δ	g	609	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
BABY CEREAL	g	120	105	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* under each group of age, sex and physiological condition, the quantity indicated corresponds to food as purchased rather than the edible portion

μ yolk only

α dry

β slice (≈ 30 g)

δ powder

INDEPENDENT VARIABLES

The three independent variables considered in this project are store size, urbanization level and deprivation index.

Store Size

Stores were classified according to four sizes:

- very small ($\leq 2,000$ square feet);
- small (2 001 to 4,000 square feet);
- medium (4,001 to 10,000 square feet);
- large or very large ($> 10,000$ square feet).

Urbanization Level

The definitions used for the urbanization level are the Statistics Canada classification³³ adopted for the analysis of the deprivation index³⁴ as shown on Figure 1.

The ZONE factor establishes the distinction between urban and rural areas. Urban areas correspond to metropolitan areas, cities, and municipalities with more than 10,000 inhabitants. Rural areas correspond to the sum of small communities that, by definition, count less than 10,000 people. Rural areas are further subdivided into three zones according to the respective influence of the metropolitan areas or cities have on employment. These zones of metropolitan influence (ZMI) are either "strong", "moderate" or "weak or nil"³⁴. This classification is shown on Figure 1.

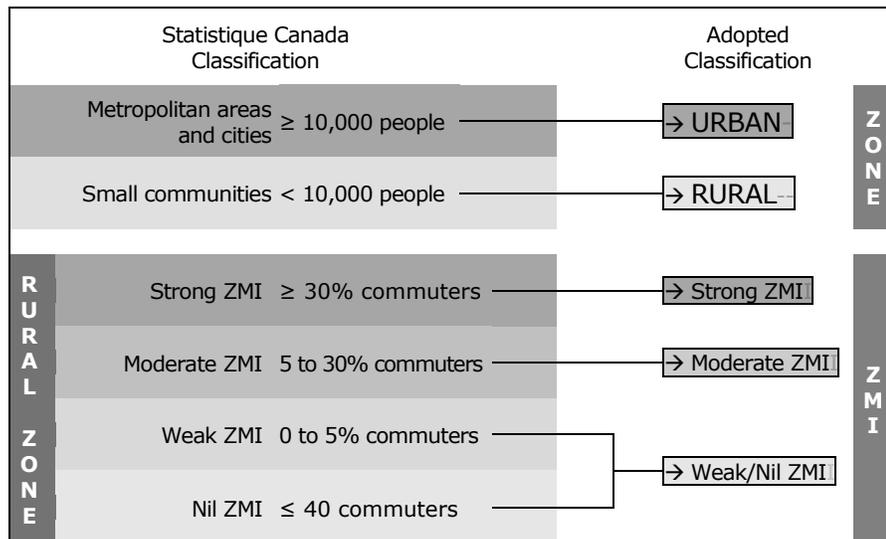


Figure 1. Classification of urbanization levels: ZONES and ZMI (adapted from³⁴)

Deprivation Index

The deprivation index takes into account material and social dimensions of a population. Each residential area of Quebec has received a quotation for the measure of deprivation on each one of the components^{35,36,37,38}.

Material deprivation is based on the following three indicators:

- the proportion of people 15 years of age or older with no certificate or high school diploma;
- the average income of people 15 years of age or older;
- the proportion of people 15 years of age or older who are on the job market.

Social deprivation is based on the following three indicators:

- the proportion of people 15 years of age or older living alone;
- the proportion of people 15 years or older whose matrimonial status is separated, divorced or widowed;
- the proportion of single-parent families.

In this project, the deprivation index is used to link deprivation with the cost of the NFB. In order to do so, each store received a deprivation index corresponding to the average deprivation value of the residential areas situated within a one kilometre radius. Then, on the basis of the deprivation values attributed to each of them, the stores were grouped into quartiles on one or the other dimension. The middle quartiles were then combined to obtain a 3-level classification of weak, moderate and strong, containing 25%, 50% and 25% of the stores, respectively.

ECONOMICAL DATA

Among other factors, food security depends upon being able to afford sufficient food to be able to be active and healthy³⁹. In order to determine if the NFB is accessible to the people in Eeyou Istchee communities, the measure used in this report is the "After-tax median income" in 2009⁴⁰. This measure is used for the following reasons:

- it is available per region and sub-region;
- it is available per family size;
- it corresponds to the amount of money available to households for acquiring goods and services, in other words for current consumption expenses.

The NFB is generally measured for a family of four comprising a couple with two children. However, Eeyouch families are often larger. Therefore, in this report, the after-tax median income used is that of families with two children as well as that of families with three or more children. The average after-tax median income will be used for the following:

- average-income families comprising a couple;
- average-income single-parent families;
- low-income families comprising a couple;
- low-income single-parent families.

ANALYSIS

A total of twenty-one stores were surveyed in Eeyou Istchee and *Jamésie*, that is 16 (of 18 available) and 5 (of 6 available) respectively. Because in these two regions the population of stores was finite, finite population corrections (fpc) have been applied to standard deviations of descriptive statistics. This correction was not applied to statistical tests as the version of SPSS used (11.0) was not able to do so. Henceforth, results from statistical tests are accurate, although conservative.

Frequency distributions are provided for Eeyou Istchee and *Jamésie* for the following categorical variables: store size, urbanization level (zone and ZIM), and deprivation index (material and social). Descriptive statistics are provided for: the weekly cost of the NFB for the reference family of four by region (Eeyou Istchee and *Jamésie*), subregion (coastal and inland of Eeyou Istchee), and community; average cost per person per day; and average weekly cost by group of age, sex and physiological

condition. The latter allows for easy calculation of the weekly cost of breastfeeding and comparison of this to the weekly cost of formula feeding.

The cost of the NFB (which is a per week value) was multiplied by 52 to determine the annual cost, and subsequently divided by the median annual after-tax income of a family to illustrate the cost of the NFB in the Eeyouch economical context. This was calculated for the MDD reference family with two children as well for a family with four children, which is more representative of Eeyouch families. In each case, this was also done for a single parent, female-led household. Each of these calculations were conducted for families with an average income and those with a low-income.

Descriptive statistics are also provided for the availability of food items for Eeyou Istchee (overall, by inland and coastal, and by community) and *Jamésie*. Additionally, a variable denoted 'truly missing in community' has been provided to illustrate the actual availability of food items within a community; only if a food item is missing in all stores surveyed in a community is it considered 'truly missing'.

The effect of store size, urbanization level, and deprivation index on the cost of the NFB and on the availability of food items was investigated using ANOVA and regression analysis, as appropriate. In cases where the distribution of the data was not normal, the Welch statistic was used for categorical variables. For tests that were significant, post hoc analysis using the Tukey and Games-Howell statistics, as appropriate, were performed to determine where differences lie. The effect of deprivation index was investigated on all 21 stores together to maximize sample size in each quartile.

T-tests were used to determine differences in cost of NFB and food availability between the coastal vs. inland region of Eeyou Istchee, as well as Eeyou Istchee vs. *Jamésie*. Chi-square analysis determined if there was a detectible difference in store size, urbanization level, or deprivation level between these regions, which might account for any observed differences in food cost and availability.

The three stores from the Abitibi region are only summarily described. They were included in the store survey because they are among those frequented by the Eeyouch. As they were not randomly chosen, it would be inappropriate to conduct statistical analysis on these stores or include them with others, given the violation of the randomness assumption inherent to statistical techniques.

The threshold for statistical significance was set at $p < 0.05$.

ACCESS TO A NUTRITIOUS FOOD BASKET IN EYYOU ISTCHEE

RESULTS

EYYOU ISTCHEE

DESCRIPTIVE RESULTS

Surveyed Stores

Table 3 describes the 16 stores of Eeyou Istchee according to store size, urbanization level and deprivation index. Most of these stores (11) are small, four are of medium size and only one exceeds 10,000 sq.ft. As none of the communities' populations exceeds 10,000 people, these stores serve a rural population in which there is no strong ZMI, i.e. they are not close to an urban centre. Concerning the deprivation index, which is a relative measure based on the 21 stores combined, the population appears to differ according to relative material and social deprivation. Material deprivation, which is linked to income, appears to be more present than social deprivation: only 2 out of 16 communities are of low material deprivation while 7 out of 16 are of low social deprivation.

Table 3. Description of the sites of the 16 Eeyou Istchee stores in which price tallying was conducted according to store size, urbanization level and deprivation index

Store size	(n)
Very small ($\leq 2,000$ sq. ft)	5
Small (2,001 to 4,000 sq. ft)	6
Medium (4,001 to 10,000 sq. ft)	4
Large/Very large ($> 10,001$ sq. ft)	1

Urbanization level – Rural*		(n)
Zones of metropolitan influence (ZMI)	Moderate	13
	Weak or nil	3

* The population of all communities is less than 10,000 people.

Level	Deprivation index	
	material (n)	social (n)
Weak	2	7
Moderate	8	5
Strong	6	4

According to the urbanization level, all Eeyou Istchee communities are classified as rural. Table 4 shows the distribution of the 16 Eeyou Istchee stores per community, according to store size as well as the dimensions of the deprivation index characterizing each community.

Table 4. Distribution of the 16 Eeyou Istchee stores according to store size per community and the deprivation index of the community

	Store size* (n)				Deprivation index characterizing the community	
	Very small	Small	Medium	Large	Material dimension**	Social dimension***
Coastal	Chisasibi	2	1		Moderate	Weak
	Whapmagoostui			2	Strong	Strong
	Wemindji		1	1	Strong	Moderate
	Waskaganish	1	1		Strong	Weak
	Eastmain	1			Moderate	Moderate
Inland	Waswanipi	1	1		Weak	Strong
	Nemaska		1		Moderate	Moderate
	Oujé-Bougoumou**	1			Moderate	Moderate
	Mistissini	1			Moderate	Weak

* Very small ($\leq 2,000$ sq. ft) – Small (2,001 to 4,000 sq. ft) – Medium (4,001 to 10,000 sq. ft) – Large/Very large ($> 10,001$ sq. ft)

** Variables linked to income level

*** Variables linked to socialization (living alone / separated, divorced, widowed / single-parent families)

Availability of the NFB Items

Although a list of acceptable substitutes had been established, there were NFB items commonly unavailable, both within individual stores as well as within entire communities.

Among the 16 stores surveyed in Eeyou Istchee, there were four convenience stores. In three communities (Chisasibi, Waswanipi and Mistissini), the presence of a convenience store did not influence the number of unavailable NFB items: in Oujé-Bougoumou however the convenience store was the only store on site. This explains that more than half of the NFB items were missing in the community (Table 5): Thus, Eeyouch in Oujé-Bougoumou must purchase food from outside their community. In the other eight communities, the number of NFB items 'truly missing' varies from 2 in Mistissini to 14 in Eastmain (Table 5).

Table 5. NFB items 'truly missing' per Eeyou Istchee individual community

Communities	Stores (n)	NFB items missing (n)	
Coastal	Chisasibi	3	4
	Whapmagoostui	2	5
	Wemindji	2	6
	Waskaganish	2	7
	Eastmain	1	14
Inland	Waswanipi	2	13
	Nemaska	1	7
	Oujé-Bougoumou	1*	41
	Mistissini	2	2

* Only a convenience store in the community

In the 16 stores, out of 1136 NFB items (16x71), 271 or 23.8% were missing. In the 10 coastal stores, out of 710 NFB items, 119 or 16.8% were. In the 6 inland stores, 152 out 426 (6x71) or 35.7% were missing. Without accounting for Oujé-Bougoumou, the percentage decreases to 31.2%.

In average, 17 items per store were unavailable representing 24% of the NFB items. Oujé-Bougoumou, with only a convenience store and 41 NFB items missing, is not taken into account on Table 6. This table shows the number of communities in which 19 NFB items were totally unavailable. Foods of similar nutritive value are part of the NFB multiple-item categories. In

the **LEGUMES** category, for instance, one item was available in all communities. Thus, nutritious needs could be met but variety was limited.

Table 6. Number of Eeyou Istchee communities in which NFB items were totally unavailable*

NFB category	Item	Unavailable in (n) of communities		
		5 Coastal	3 Inland*	All 8
MILK	1% fat	1	1	2
MEAT	Beef, inside round		2	2
	Beef, boneless stewing	1	2	3
LIVER	*	4	1	5
FISH	White fillets	2		2
CHEESE	Cheddar		1	1
	Canned red kidney beans		2	2
LEGUMES	Canned chick peas	2	2	4
	Dry lentils	5	1	6
	Dry kidney beans	5	3	8
	Dry split yellow peas	1		1
CITRUS FRUITS	Orange juice		1	1
OTHER FRUITS	Fresh pears or peaches		1	1
POTATO	*	1		1
OTHER VEGETABLES	Turnip or rutabaga	1	1	2
	Broccoli	1		1
	Fresh tomatoes	1		1
	Frozen mixed vegetables		1	1
FLAX SEED	*	5	3	8

* Uujé-Bougoumou, with only a convenience store and 41 unavailable NFB items, is excluded from the table.

* One-item category

Appendix 5 presents a detailed description of the availability of the NFB items per store and per community.

Table 7. Average cost of the NFB categories in Eeyou Istchee

Food category	Unit	Coastal 10 stores	Inland 6 stores	Total 16 stores
MILK				
1% fat	4 L	\$12.02	\$7.91	\$10.65
2% fat	4 L	\$10.89	\$8.16	\$9.86
3.25% fat	4 L	\$10.65	\$8.06	\$9.61
MEAT	Kg	\$12.26	\$10.66	\$11.66
LIVER	Kg	\$10.24	\$9.27	\$9.88
FISH	Kg	\$19.14	\$14.65	\$17.45
EGG	Unit	\$0.30	\$0.26	\$0.28
CHEESE	Kg	\$22.53	\$19.54	\$21.41
PEANUT BUTTER	Kg	\$9.68	\$8.83	\$9.36
LEGUMES *	Kg	\$8.77	\$7.10	\$8.14
CITRUS FRUITS	Kg	\$3.75	\$2.53	\$3.29
OTHER FRUITS	Kg	\$4.91	\$3.67	\$4.44
POTATO	Kg	\$2.06	\$1.23	\$1.75
OTHER VEGETABLES	Kg	\$5.19	\$3.89	\$4.70
BREAD	Kg	\$5.10	\$5.40	\$5.21
BREAKFAST CEREALS	Kg	\$9.91	\$7.31	\$8.94
OTHER CEREAL PRODUCTS	Kg	\$4.68	\$3.78	\$4.34
BUTTER/MARGARINE	Kg	\$12.75	\$10.84	\$12.03
OTHER FATS	Kg	\$7.91	\$7.76	\$7.85
SUGAR	Kg	\$3.01	\$3.00	\$3.00
SWEETS	Kg	\$9.74	\$8.18	\$9.15
FLAX SEED **	Kg	\$4.78	\$4.78	\$4.78
INFANT FORMULA	Kg	\$42.84	\$60.42	\$49.43
BABY CEREAL	Kg	\$28.18	\$24.65	\$26.86
MISCELLANEOUS	Adult	***	\$3.21	\$2.91
	Child	***	\$1.54	\$1.43

* The price in *Jamésie* was used. This item represents \approx 1/8 of the category and 0.28% of the cost of the NFB.

** The price in *Jamésie* was used. This category represents 0.23% of the cost of the NFB.

*** Weekly allowance

Cost of the NFB Categories

Table 7 presents the cost of the 22 food categories in the NFB as well as the cost of the **MISCELLANEOUS** items for adults and children. The cost of the various food categories is higher in the stores of the coastal communities than in the ones located inland, except for the **BREAD** and **INFANT FORMULA** categories.

Expiration Date

The expiration date was verified for all the items included in the following NFB categories: **MILK**, **CHEESE**, **EGG** and **BREAD**. No expired perishable food items were noted for these categories in any of the Eeyou Istchee stores.

Cost of the NFB per Group of Age, Sex and Physiological Condition

Table 8 presents this cost in the Eeyou Istchee communities (coastal, inland and all respectively). The cost of the NFB for any household can thus be established. For instance, for the MDD reference family of four, the weekly cost of the NFB in Eeyou Istchee is:

- Man 31 to 50: \$79.56
- Woman 31 to 50: \$71.23
- Boy 14 to 18: \$89.97
- Girl 9 to 13: \$71.71

for a total of \$312.47 as the Cost of the NFB. For a larger family with four children (MDD reference family + a boy 4 to 8 and a child 1 to 3), which is more representative of Eeyou families, the cost of the NFB amounts to \$418.41.

Table 8. Weekly cost of the NFB per group of age, sex and physiological condition in Eeyou Istchee

Group of age, sex and physiological condition	Coastal communities 10 stores		Inland communities 6 stores		All communities 16 stores	
	Mean weekly NFB cost	Standard deviation	Mean weekly NFB cost	Standard deviation	Mean weekly NFB cost	Standard deviation
Child 6 months to 1	\$42.48	\$1.69	\$50.33	\$4.24	\$45.42	\$2.89
Child 1 to 3	\$49.67	\$1.54	\$39.37	\$0.85	\$45.81	\$1.36
Boy 4 to 8	\$65.28	\$1.97	\$51.55	\$1.66	\$60.13	\$1.81
Boy 9 to 13	\$83.19	\$2.50	\$65.96	\$2.18	\$76.72	\$2.28
Boy 14 to 18 *	\$97.22	\$2.76	\$77.89	\$2.72	\$89.97	\$2.56
Man 19 to 30	\$91.04	\$2.54	\$72.41	\$2.48	\$84.05	\$2.41
Man 31 to 50 *	\$86.18	\$2.37	\$68.54	\$2.45	\$79.56	\$2.27
Man 51 to 70	\$85.31	\$2.18	\$67.79	\$2.95	\$78.74	\$2.23
Man > 70	\$81.98	\$2.13	\$65.06	\$2.81	\$75.63	\$2.15
Girl 4 to 8	\$62.25	\$1.92	\$48.99	\$1.53	\$57.28	\$1.75
Girl 9 to 13 *	\$77.91	\$2.41	\$61.37	\$1.99	\$71.71	\$2.19
Girl 14 to 18	\$81.02	\$2.50	\$63.73	\$2.12	\$74.53	\$2.28
Woman 19 to 30	\$79.28	\$2.25	\$62.41	\$2.18	\$72.96	\$2.16
Woman 31 to 50 *	\$77.41	\$2.21	\$60.92	\$2.14	\$71.23	\$2.11
Woman 51 to 70	\$76.90	\$2.03	\$60.75	\$2.66	\$70.84	\$2.06
Woman > 70	\$73.81	\$1.99	\$58.08	\$2.54	\$67.91	\$2.00
Pregnant ≤ 18	\$91.13	\$2.63	\$72.35	\$2.15	\$84.09	\$2.44
Pregnant 19 to 30	\$88.45	\$2.61	\$69.96	\$2.08	\$81.51	\$2.40
Pregnant 31 to 50	\$87.17	\$2.59	\$68.84	\$2.01	\$80.30	\$2.38
Breastfeeding ≤ 18	\$88.92	\$2.61	\$70.36	\$2.09	\$81.96	\$2.41
Breastfeeding 19 to 30	\$88.45	\$2.61	\$69.96	\$2.08	\$81.51	\$2.40
Breastfeeding 31 to 50	\$87.46	\$2.59	\$69.13	\$2.03	\$80.59	\$2.39
MDD reference family	\$338.71	\$9.73	\$268.73	\$9.27	\$312.47	\$9.12
Four-children family^o	\$453.66	—	\$359.65	—	\$418.41	—

* member of the MDD reference family

^o This family (MDD reference family + a boy 4 to 8 and a child 1 to 3) is more representative of the families in Eeyou Istchee.

Cost of the NFB

In Eeyou Istchee, the average weekly cost of the NFB for the MDD reference family of four is \$312.47 (\pm \$9.12). Table 9 shows this cost for Eeyou Istchee by subregion and by community. The cost of the NFB varies greatly, Whapmagoostui is the most expensive (\$398.78) and Mistissini the least (\$244.07). In Oujé-Bougoumou, the cost was obtained in using the price of the 41 missing items according to the methodology for unavailable NFB items. This, of course, is an artificial data. It is not possible to entirely purchase the NFB in this community.

Broken down per person per day, the following variations are noted in the NFB cost:

- minimum: \$8.72 (lowest cost registered in one of the 16 stores);
- maximum: \$14.24 (highest cost registered in one of the 16 stores);
- mean: \$11.16;
- median: \$10.60.

Table 9. Weekly cost of the NFB for the reference family of four in Eeyou Istchee and its individual communities*

	Stores (n)	Mean cost	Standard deviation	Daily cost per person	Standard deviation	
Coastal	All coastal communities	10	\$338.71	\$9.73	\$12.08	\$0.35
	Chisasibi	3	\$298.74	\$0.00	\$10.67	\$0.00
	Whapmagoostui	2	\$398.78	\$0.00	\$14.24	\$0.00
	Wemindji	2	\$322.48	\$0.00	\$11.52	\$0.00
	Waskaganish	2	\$349.03	\$0.00	\$12.47	\$0.00
	Eastmain	1	\$350.33	n/a	\$12.51	n/a
Inland	All inland communities	6	\$268.73	\$9.27	\$9.45	\$0.33
	Waswanipi	2	\$282.53	\$5.12	\$10.09	\$1.64
	Nemaska	1	\$273.72	n/a	\$9.78	n/a
	Oujé-Bougoumou**	1	\$285.48	n/a	\$10.20	n/a
	Mistissini	2	\$244.07	\$0.00	\$8.72	\$0.00
All Eeyou Istchee communities	16	\$312.47	\$9.12	\$11.16	\$0.33	

* Details of the cost of the NFB in coastal and inland communities, including the price of individual food items, are presented on Appendices 6 and 7.

** It is not possible to entirely purchase the NFB in Oujé-Bougoumou. The data presented here was obtained in using the cost of the 41 missing items according to the methodology for unavailable NFB items.

The Nutrition North Canada Program⁴¹

Nutrition North Canada (NNC) is a subsidy program, launched on April 1, 2011, that seeks to improve access to perishable healthy food in isolated northern communities. Only communities without year-round surface transportation (i.e. no permanent road, rail or marine access) are eligible. Based on this criterion, Whapmagoostui is the only community of Eeyou Istchee eligible for the program as it is only accessible by plane and boat part of the year.

In one of the Whapmagoostui stores, price tallying for the present project coincided with the introduction of the NNC program. In fact, prices were being changed during the price tallying. Whenever the two sets of prices were available, the nutritionist noted both. Differences between before and after introduction of the food program were noted in the following food items, accounting for a reduction of:

- 61% for milk – from \$13.29 to \$5.15 for 2%, and \$14.19 to \$5.45 for 3.25%, for the 4-litre bag;
- 17% for ground beef – from \$11.69 to \$9.69 per kg;
- 33% for oranges – from \$8.35 to \$5.59 per kg;
- 36% for apples – from \$8.79 to \$5.64 per kg;
- 50% for potatoes – from \$13.29 to \$6.59 for the 10-pound-bag.

RESULTS ACCORDING TO THE INDEPENDENT VARIABLES

Effect of Store Size on the Availability of NFB Items

Availability of food items was inversely related to store size. As determined by regression of number of items unavailable on the inverse of store size, as shown in Figure 2, store size was found to account for 42% of the variation in missing food items ($p = 0.0038$)

This relationship can also be illustrated as follows (Figure 3):

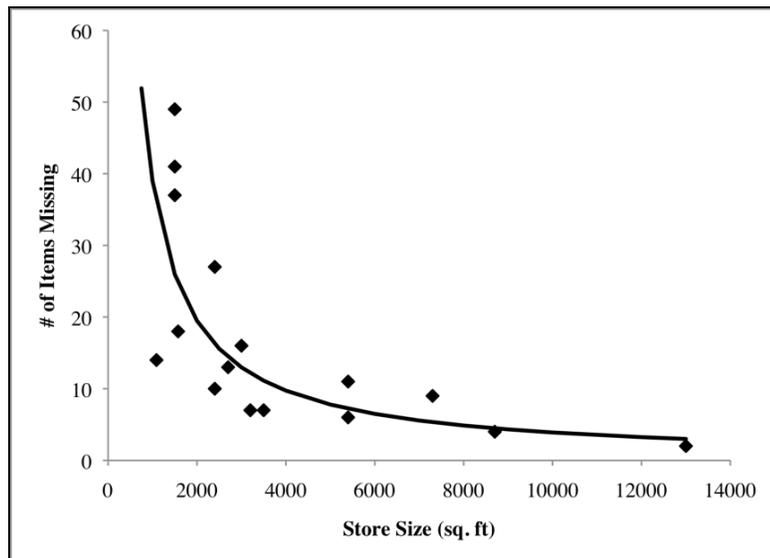


Figure 2. Regression of number of NFB items missing in Eeyou Istchee stores by the inverse of store size

When store size is treated as a categorical variable, the inverse relationship between store size and number of items missing remains apparent ($p = 0.011$) as shown on Figure 3. The smallest stores had significantly more items missing compared to stores of larger size ($p < 0.03$ for both, largest store size omitted from post hoc analysis due to a sample size of one).

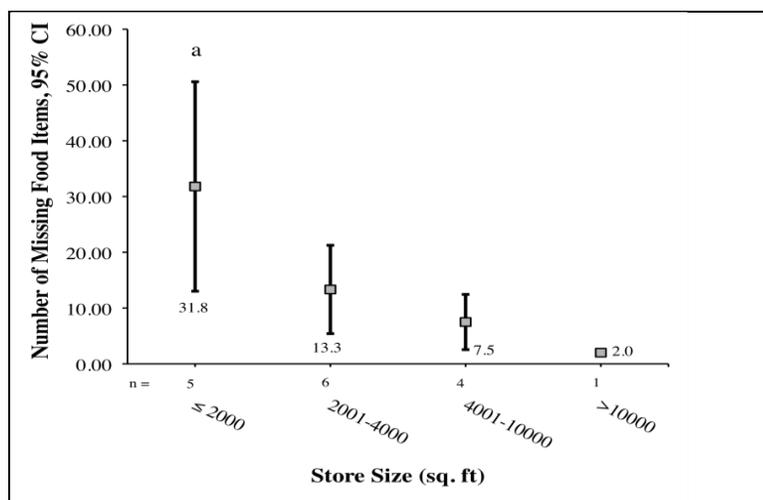


Figure 3. Number of missing food items by store size in Eeyou Istchee
 a Stores $\leq 2,000$ have more food items missing than stores 2001-4000 ($p = 0.027$) and 4001-10000 ($p = 0.01$) square feet.

Effect of Urbanization Classification and Deprivation Index on the Availability of NFB Items

Availability of NFB food items was not affected by urbanization level nor deprivation index.

Effect of Store Size, Urbanization Classification, and Deprivation Index on the Cost of the NFB

In Eeyou Istchee, the cost of the NFB is not affected by store size, urbanization classification, or deprivation index.

Cost and Availability of the NFB in Coastal and Inland Stores

Figure 4 shows that the location of the store has a significant impact on the NFB cost.

The NFB is more expensive in the coastal stores ($p = 0.002$). The average cost of the NFB is \$338.71 in coastal, and \$268.73 in inland communities.

Although there is a considerable difference in the cost of the NFB between coastal and inland communities, there is no detectable difference between these two sub-regions according to availability of the NFB items, store size, urbanization level or deprivation index.

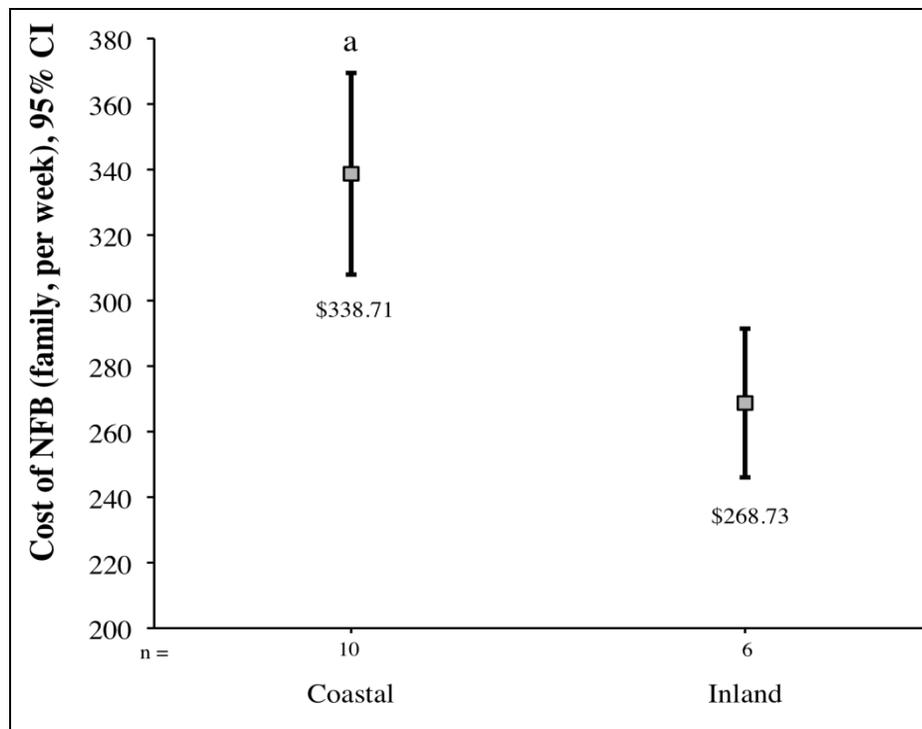


Figure 4. Cost of the NFB in coastal and inland Eeyou Istchee communities
a Higher in coastal stores compared to inland ones ($p = 0.002$)

Cost of the NFB in the Economical Context of Eeyouch Families

In Eeyou Istchee, the mean weekly cost of the NFB for a family of four (two adults, two children) was \$312.47 for an annual cost of \$16,248 (rounded). The weekly cost for the single-parent family was \$244.56[⊕] for an annual cost of \$12,717 (rounded).

In 2009, the after-tax median incomes (amount available for consumption of goods and services) of Eeyouch families with two children were⁴⁰:

- \$77,630 for the average-income family comprising a couple;
- \$29,150 for the average-income single-parent family;
- \$20,060 for the low-income family comprising a couple;
- \$16,470 for the low-income single-parent family.

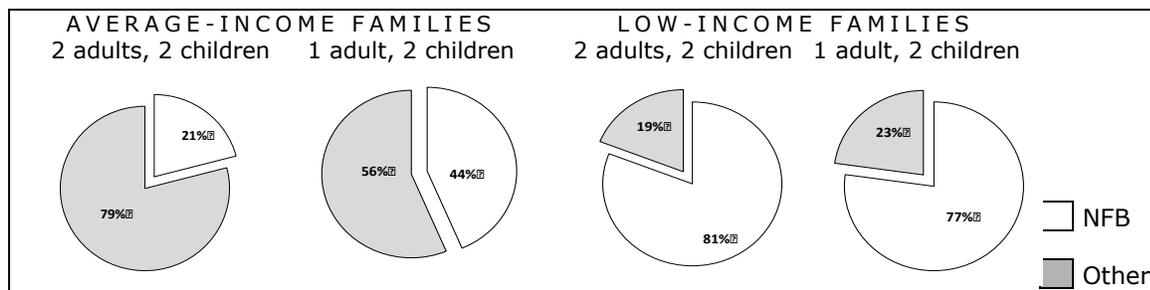


Figure 5. Eeyou Istchee – Proportion of the after-tax median income occupied by the cost of the NFB for four types of families with two children

Figure 5 shows the proportion of the after-tax median income required for the Eeyouch families with two children to purchase the NFB. The NFB represents 21% of the average-income family of four and as much as 44% of the average-income single-parent family, 81% of the low-income family of four and 77% of the low-income single-parent family.

Cost of the NFB in the Economical Context of Eeyouch Families with Three or more Children

Eeyouch families often comprise more than two children. In order to better represent these families, two children were added to the MDD reference family: a boy 4 to 8 and a child, 1 to 3. For these two children, the NFB respectively costs \$60.13 per week and \$45.81 per week (Table 8).

Therefore, the weekly cost of the NFB for families that are more representative of Eeyouch families, increases to:

- \$418.41 for a family comprising a couple with four children for an annual cost of \$21,757 (rounded);
- \$355.79[▼] for a single-headed family with four children for an annual cost of \$18,501 (rounded).

[⊕] Weekly cost for a woman 31 to 50, a boy 14 to 18 and a girl 9 to 13, is \$71.23, \$89.97 and \$71.71 respectively, for a total of \$232.91 + 5 % (adjustment for family size) = \$244.56.

[▼] Weekly cost for a woman 31 to 50, a boy 14 to 18, a girl 9 to 13, a boy 4 to 8 and a child 1 to 3 is \$71.23, \$89.97, \$71.71, \$60.13 and \$45.81 respectively, for a total of \$338.85 + 5 % (adjustment for family size) = \$355.79.

In 2009, the after-tax median incomes (amount available for consumption of goods and services) for the Eeyouch families with three or more children were:

- \$75,100 for the average-income family comprising a couple;
- \$34,370 for the average-income single-parent family;
- \$29,480 for the average low-income family comprising a couple;
- \$24,050 for the low-income single-parent family.

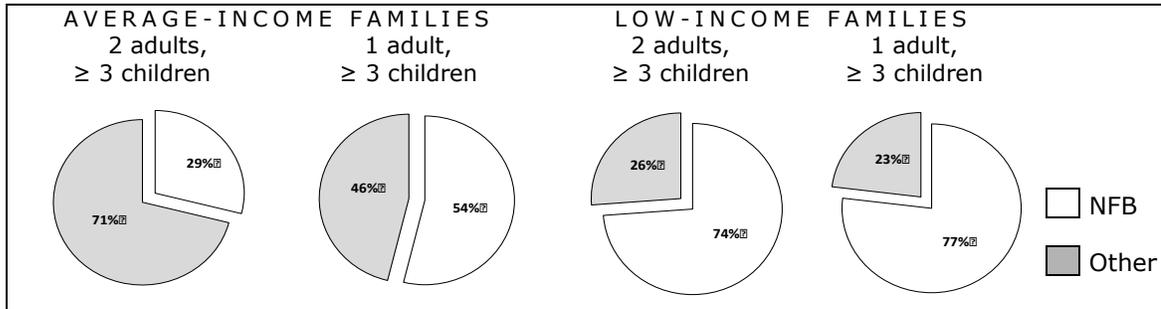


Figure 6. Eeyou Istchee – Proportion of the after-tax median income occupied by the cost of the NFB for four types of families with three or more children

Figure 6 shows the proportion of the after-tax median income required for the Eeyouch families with three or more children to purchase the NFB. The NFB occupies 29% of the average-income family comprising a couple and as much as 54% of the average-income single-parent family, 74% of the low-income family comprising a couple and 77% of the low-income single-parent family.

JAMÉSIE

Five (5) stores in *Jamésie* where Eeyouch families purchase food were also surveyed for the cost and availability of the NFB items.

DESCRIPTIVE RESULTS

Surveyed Stores

Table 10 describes the five (5) stores in *Jamésie* according to store size, urbanization level and deprivation index. Three (3) of these stores had more than 10,001 sq.ft while the two (2) others were medium size. As none of these communities' population exceeds 10,000 people, these stores serve a rural population in which there is no strong zone of metropolitan influence (ZMI), i.e. they are not close to an urban centre. Concerning the deprivation indices, which are a relative measures of the 21 stores combined, there is no strong material deprivation in these communities though one of them is strongly deprived socially.

Table 10. Description of the sites of the 5 *Jamésie* stores in which price tallying was conducted

Store size	(n)
Medium (4,001 to 10,000 sq. ft)	2
Large/Very large (> 10,001 sq. ft)	3

Urbanization level – Rural*		(n)
Zones of metropolitan influence (ZMI)	Moderate	4
	Weak or nil	1

* The population of all communities is less than 10,000 people.

Level	Deprivation index	
	material (n)	social (n)
Weak	3	0
Moderate	2	4
Strong	0	1

Availability of the NFB Items

In two of the *Jamésie* stores, all the NFB items were available. Dry lentils were missing in two others; liver, in one; and flaxseed, in another.

Cost of the NFB Categories

Table 11 presents the cost of the 22 food categories in the NFB as well as that of the cost of the **MISCELLANEOUS** items for adults and children.

Cost of the NFB per Group of Age, Sex and Physiological Condition

Table 12 presents the weekly cost of the NFB per group of age, sex and physiological condition in the five (5) *Jamésie* stores.

Cost of the NFB

In *Jamésie*, the average weekly cost of the NFB for a family was \$226.21(± \$16.91) (Table 12). Broken down per person per day, this cost was \$8.08.

Table 11. Average cost of the NFB categories in *Jamésie*

Food category	Unit	5 stores
MILK 1% fat	4 L	\$6.69
2% fat	4 L	\$6.89
3.25% fat	4 L	\$7.15
MEAT	Kg	\$8.35
LIVER	Kg	\$8.37
FISH	Kg	\$13.18
EGG	Unit	\$0.27
CHEESE	Kg	\$15.02
PEANUT BUTTER	Kg	\$7.36
LEGUMES	Kg	\$5.26
CITRUS FRUITS	Kg	\$2.25
OTHER FRUITS	Kg	\$3.28
POTATO	Kg	\$1.35
OTHER VEGETABLES	Kg	\$3.14
BREAD	Kg	\$4.93
BREAKFAST CEREALS	Kg	\$5.68
OTHER CEREAL PRODUCTS	Kg	\$2.73
BUTTER/MARGARINE	Kg	\$8.85
OTHER FATS	Kg	\$5.44
SUGAR	Kg	\$2.35
SWEETS	Kg	\$6.26
FLAX SEED	Kg	\$6.06
INFANT FORMULA	Kg	\$31.73
BABY CEREAL	Kg	\$20.27
MISCELLANEOUS	Adult	* \$1.88
	Child	* \$1.08

* Weekly allowance

Table 12. Weekly cost of the NFB per group of age, sex and physiological condition in *Jamésie*

Group of age (years), sex and physiological condition	Mean NFB cost	Standard deviation
Child 6 months to 1	\$30.51	\$6.25
Child 1 to 3	\$33.90	\$2.67
Boy 4 to 8	\$43.51	\$3.27
Boy 9 to 13	\$55.83	\$4.20
Boy 14 to 18 *	\$65.68	\$4.67
Man 19 to 30	\$60.90	\$4.45
Man 31 to 50 *	\$57.54	\$4.27
Man 51 to 70	\$55.63	\$4.29
Man > 70	\$53.33	\$4.18
Girl 4 to 8	\$41.50	\$3.18
Girl 9 to 13 *	\$51.97	\$4.03
Girl 14 to 18	\$53.65	\$4.16
Woman 19 to 30	\$52.25	\$4.00
Woman 31 to 50 *	\$51.02	\$3.95
Woman 51 to 70	\$49.82	\$3.97
Woman > 70	\$47.73	\$3.86
Pregnant ≤ 18	\$61.75	\$4.57
Pregnant 19 to 30	\$59.71	\$4.47
Pregnant 31 to 50	\$58.89	\$4.42
Breastfeeding ≤ 18	\$60.04	\$4.51
Breastfeeding 19 to 30	\$59.71	\$4.47
Breastfeeding 31 to 50	\$59.09	\$4.43
MDD reference family	\$226.21	\$16.91

* member of the MDD reference family

RESULTS ACCORDING TO THE INDEPENDENT VARIABLES

Effect of Store Size, Urbanization Classification, and Deprivation Index on the Cost of the NFB

In *Jamésie*, the cost of the NFB is not affected by store size, urbanization classification, or deprivation index.

Cost of the NFB in the Economical Context of *Jamésie* Families

In *Jamésie*, the weekly cost of the NFB was \$226.21 for an annual cost of \$11,763 (rounded). The weekly cost for the single-parent family was \$177.11[⊕] for an annual cost of \$9,210 (rounded).

In 2009, the after-tax median incomes (amount available for the current consumption of goods and services) of the *Jamésie* families with two children were⁴⁰:

- \$83,330 for the average-income family comprising a couple;
- \$38,970 for the average-income single-parent family;
- \$20,680 for the low-income family comprising a couple;
- \$18,020 for the low-income single-parent family.

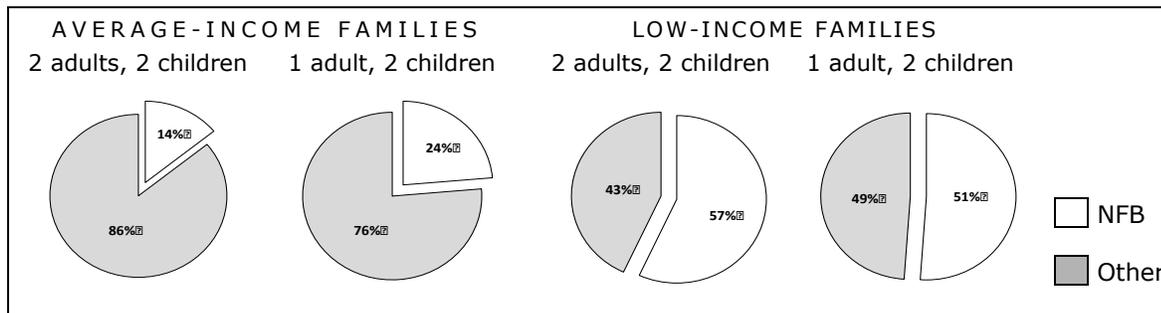


Figure 7. *Jamésie* – Proportion of the after-tax median income occupied by the cost of the NFB for four types of families with two children

Figure 7 shows the proportion of the after-tax median income required for the *Jamésie* families with two children to purchase the NFB. The NFB represents 14% of the average-income family of four and 24% of the average-income single-parent family, 57% of the low-income family of four and 51% of the low-income single-parent family.

[⊕] Weekly cost for the woman 31 to 50, the boy 14 to 18 and the girl 9 to 13, that is respectively \$51.02, \$65.68 and \$51.97\$ for a total of \$168.67 + 5 % (adjustment for family size) = \$177.11.

COMPARING EYYOU ISTCHEE AND JAMÉSIE

Cost of the NFB

The cost of the NFB is significantly higher in Eeyou Istchee (\$312.47) compared to *Jamésie* (\$226.21) with a difference of \$86.26 ($p = 0.002$) as shown in Figure 8.

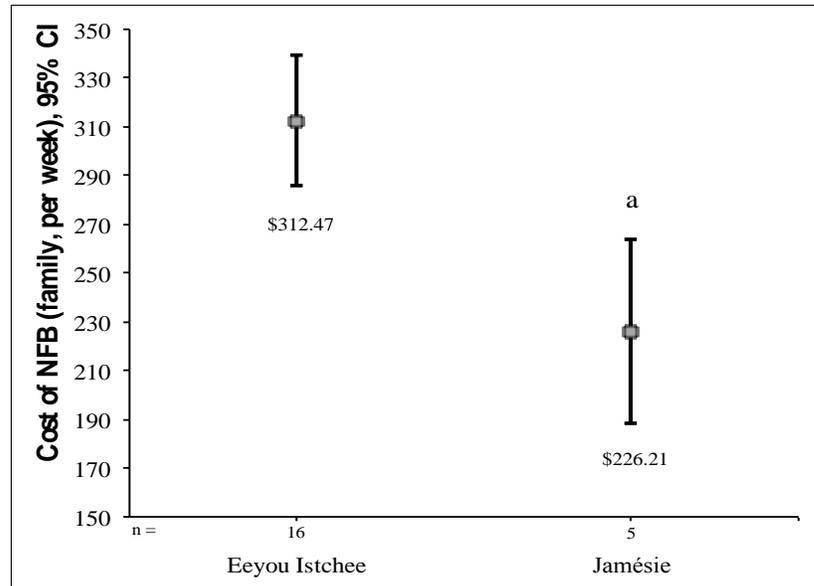


Figure 8. Cost of the NFB for the reference family in *Jamésie* compared to Eeyou Istchee
a lower in *Jamésie* ($p = 0.002$)

When contrasted against the sub-regions of Eeyou Istchee (coastal and inland), the cost of the NFB in the coastal communities, at \$338.71, is significantly higher than in *Jamésie*, with a difference \$112.50 per week ($p = 0.003$) as shown on Figure 9.

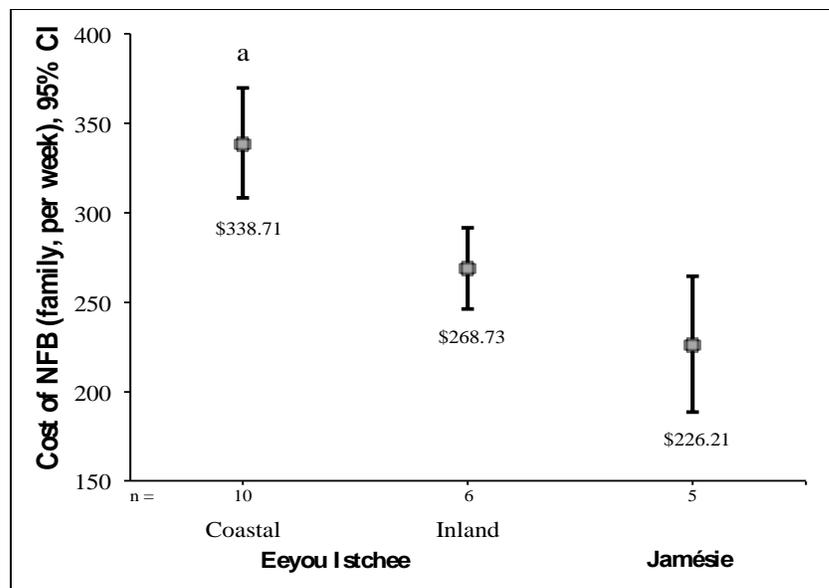


Figure 9. Cost of the NFB in *Jamésie* compared to coastal and inland Eeyou Istchee communities
a More expensive compared to *Jamésie* ($p=0.003$)

EYEOUCH PURCHASING THE NFB IN JAMÉSIE

Families with Two Children

Because Eeyouch families purchase food in *Jamésie*, it is sensible to verify how this practice influences the proportion of the Eeyouch income occupied by the cost of the NFB.

As previously stated, in 2009 the after-tax median incomes (amount available for consumption of goods and services) for the Eeyouch families with two children were⁴⁰:

- \$77,630 for the average-income family comprising a couple;
- \$29,150 for the average-income single-parent family;
- \$20,060 for the low-income family comprising a couple;
- \$16,470 for the low-income single-parent family.

The weekly cost of the NFB in *Jamésie* was \$226.21, thus \$11,763 (rounded) per year. The weekly cost for the single-parent family was \$177.11[⊕] for an annual cost of \$9,210 (rounded).

Figure 10 shows the proportion of the after-tax median income required for the Eeyouch families with two children to purchase the NFB in *Jamésie*. The NFB represents 15% of the average-income family of four and 32% of the average-income single-parent family, 59% of the low-income family of four and 56% of the low-income single-parent family.

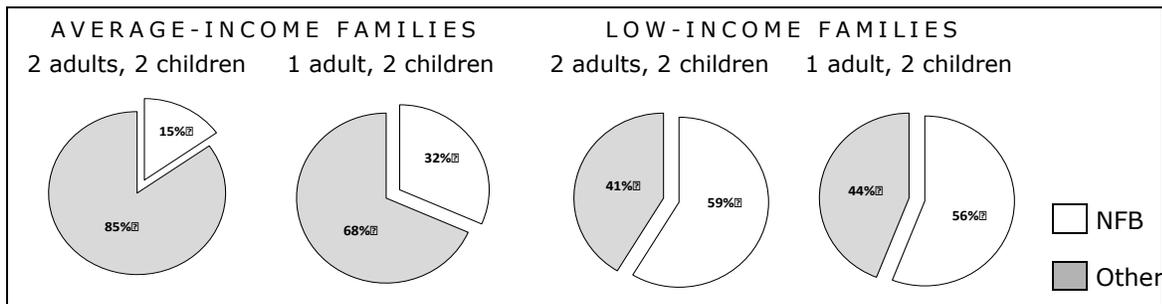


Figure 10. Eeyouch purchasing food in *Jamésie* – Proportion of the after-tax median income occupied by the cost of the NFB for four types of families with two children

Families with Three or more Children

As previously stated, in 2009 the after-tax median incomes (amount available for consumption of goods and services) for the Eeyouch families with three or more children were:

- \$75,100 for the average-income family comprising a couple;
- \$34,370 for the average-income single-parent family;
- \$29,480 for the low-income family comprising a couple;
- \$24,050 for the low-income single-parent family.

Adding the weekly cost of one boy between 4 and 8 (\$43.51) and one child between 1 and 3 (\$33.90) to the reference family of four in *Jamésie* (\$226.21) (Table 12) makes a total of \$303.62 per week and annual cost of \$15,788 (rounded) for a representative

[⊕] Weekly cost for the woman 31 to 50, the boy 14 to 18 and the girl 9 to 13, that is respectively \$51.02, \$65.68 and \$51.97\$ for a total of \$168.67 + 5 % (adjustment for family size) = \$177.11.

family of six. For the single-parent family with four children, the cost per week of the NFB is \$262.23[▼] for an annual cost of \$13,636 (rounded).

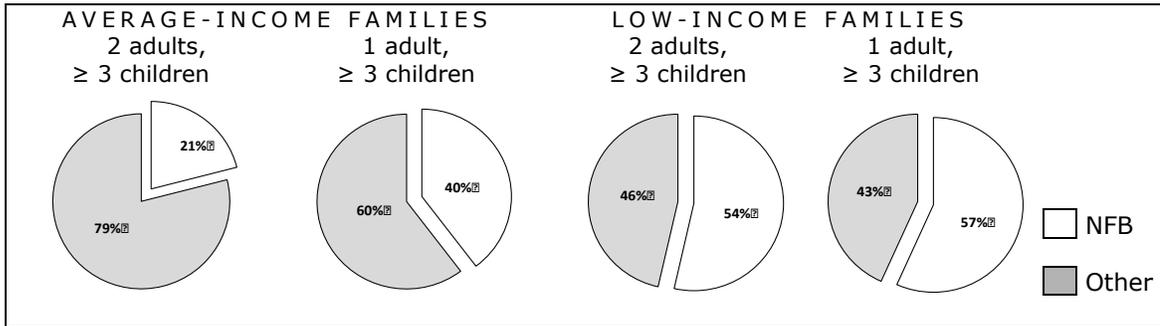


Figure 11. Eeyouch purchasing food in *Jamésie* – Proportion of the after-tax median income occupied by the cost of the NFB for four types of families with three or more children

Figure 11 shows the proportion of the after-tax median income required for the Eeyouch families with three or more children to purchase the NFB in *Jamésie*. The NFB represents 21% of the average-income family comprising a couple and 40% of the average-income single-parent family, 54% of the low-income family comprising a couple and 57% of the low-income single-parent family.

▼ Weekly cost for a woman 31 to 50, a boy 14 to 18, a girl 9 to 13, a boy 4 to 8 and a child 1 to 3 is \$51.02, \$65.68, \$55.83, \$43.31 and \$33.90 respectively, for a total of \$249.74 + 5 % (adjustment for family size) = \$262.23.

EFFECT OF THE DEPRIVATION INDEX

Although urbanization and the deprivation index had no effect on the cost of the NFB in Eeyou Istchee or in *Jamésie*, these variables were analysed in combining all the 21 stores (16 in Eeyou Istchee plus 5 from *Jamésie*) to maximize sample size in assessment of the influence of material and social deprivation on NFB cost and availability. No effect of the urbanization level was detected while the material dimension of the deprivation index did.

Although material deprivation does not affect the availability, it does affect the cost of the NFB ($p = 0.001$). It is significantly higher ($> \$100$ more per week) in stores situated in areas with strong material deprivation compared to their better-off counterparts situated in areas with low material deprivation ($p = 0.002$), as shown in Figure 12.

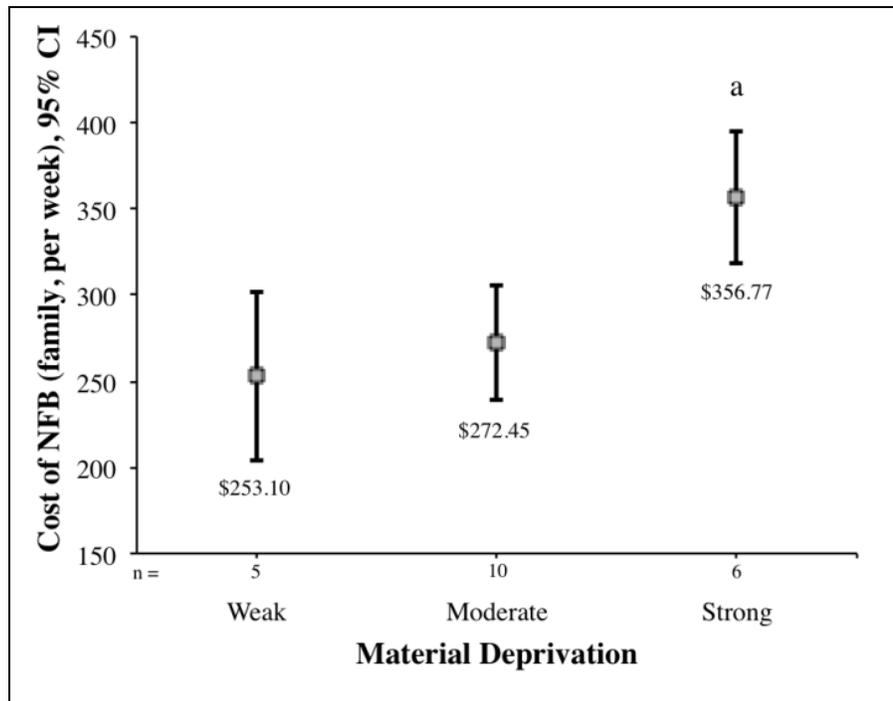


Figure 12. Cost of the NFB by material deprivation quartile

- a More expensive in the stores situated in areas with strong material deprivation compared to those in weak material deprivation ($p = 0.002$)

Social deprivation does not influence the cost nor the availability of the NFB.

STORES OF ABITIBI URBAN CENTRES

Eeyouch also purchase food from stores in Abitibi urban centres. Since prices were tallied in only three stores from this area, only descriptive data is provided.

Store Size

Two of the three stores are larger than 10,000 square feet; the other was 9,000 square feet.

Availability of the NFB Items

All the NFB items were available in two of the three stores. The missing items in the other store were dry lentils and dry red kidney beans.

Cost of the NFB

In these three stores, the weekly cost of the NFB for the MDD reference family of four was respectively \$209.71, \$220.16, and \$222.53.

The cost of the NFB in these three stores is close to the \$226.21 it costs in *Jamésie*.

ACCESS TO A NUTRITIOUS FOOD BASKET IN EYYOU ISTCHEE

DISCUSSION

Use of the NFB

The NFB of the MDD provides an argument in support of the population at risk of food insecurity; it is also a useful tool for nutrition education and counselling.

In calculating the cost of the NFB in a given area, and comparing this cost against the available income of the population, the NFB is an important measure as to whether food security is achievable within the population. For this purpose, respecting the composition of the NFB is critical to allow comparisons from one area to another.

On the other hand, using the NFB for the purpose of education or counselling entails all the subtlety of knowledge in food composition. Table 1 shows the different items comprised in each of the NFB food categories. Not only are the food items in each category more or less interchangeable, other foods of similar composition could also be recommended if the price was in a similar range. There relies the responsibility of the nutrition educator/counsellor toward his or her clientele.

Finally, let us stress the fact that the establishment of the cost of the NFB is in no way a mean of evaluating the adequacy of a population's food habits.

The project on "ACCESS TO A NUTRITIOUS FOOD BASKET IN EYYOU ISTCHEE"

As the first step toward CBHSSJB long-term goal of improving access to healthy foods for the Eeyou Istchee population, the present project aimed to determine the average minimal cost of the NFB in the stores of Eeyou Istchee and nearby sites where Eeyouch regularly purchase food. This discussion first concerns results obtained in Eeyou Istchee. A comparison of these results with the situation elsewhere follows.

EYYOU ISTCHEE

Stores of Eeyou Istchee

Price tallying was conducted in almost all Eeyou Istchee stores that carried food items, regardless of store type (for example; convenience stores, grocery stores, etc.). Among the 16 stores surveyed, there were four small-size convenience stores carrying very few or even none of the items in the following NFB categories: **MEAT, FISH, LEGUMES, FLAXSEED, CITRUS FRUITS, OTHER FRUITS** and **VEGETABLE**. Three of these convenience stores were located in communities where there was also at least one larger store. In the Oujé-Bougoumou community, there was only a convenience store.

Availability of the NFB items in the stores of Eeyou Istchee

Unavailability of NFB items was not surprising, although substitutes had been planned (Appendix 4). The number of the NFB items 'truly missing' (i.e. not available in any store within a community) varied greatly (Table 6) and in Oujé-Bougoumou, where 41 items were missing, it was impossible to buy the NFB. In Mistissini, only two NFB items

were not available. In other communities, the number of the NFB items 'truly missing' ranged from four to 14 (Table 5 and Appendix 5).

There were only two NFB items 'truly missing' in all Eeyou Istchee communities:

- dry red kidney beans, one of the seven items in the **LEGUMES** category. This absence is of no particular concern as this food is interchangeable with other items of the category (N.B. It represent only 0.23% of the NFB cost);
- **FLAXSEED**, which is part of the NFB (0.28% of NFB cost) as a one-item category, to ensure sufficient omega-3 fat intake. Absence of this food in Eeyou Istchee stores does not seem to represent a nutritional concern, since Eeyouch may get their omega-3 fat through other sources: both from caught fish (still culturally present in Eeyouch diet) or commercial fish.

Although the number of the NFB items 'truly missing' per community appear somewhat similar in the two sub-regions (Table 5), there was a greater proportion of missing items in the inland compared to coastal communities, 35.7% (31.2% when Oujé-Bougoumou is not taken into account) and 16.8% respectively (see text on page 14). This may be due to some degree to the closer proximity of the inland communities with *Jamésie* and Abitibi where a wider variety of food is available.

The availability of the NFB items was shown to be statistically associated with store size (Figure 2 and Figure 3). This result is in accordance with studies conducted by the MDD^{23,25} and others⁴² showing less variety in the food items available in smaller stores. While it was not the case in this project, store size was also associated with higher cost in smaller stores in the mentioned studies.

Cost of the NFB Categories

The cost of food categories was generally higher in coastal, compared to inland communities (Table 7). Transportation cost may explain part of this difference. Nevertheless, there were two exceptions: **BREAD** and **INFANT FORMULA** were more expensive in inland communities.

BREAD

The difference occurring in the cost of the **BREAD** category is mainly caused by the large difference in the price of hamburger buns: \$4.69 per 516-gram package in inland communities compared to \$3.21 in coastal ones.

Some Eeyouch may make their own bread. It is therefore of interest to take this into account and compare the cost of homemade bread to store-bought bread, which is \$3.19 and \$3.23 in the coastal and inland communities, respectively. Thus, the cost of homemade bread in Eeyou Istchee was calculated from a standard five-loaf recipe[Ⓢ]. On the basis of the prices tallied in the project, the cost of homemade bread prepared with all-purpose or whole-wheat flour is respectively:

- \$1.42 and \$1.61 per loaf in the coastal communities;
- \$1.48 and \$1.45 per loaf in the inland communities.

For the MDD reference family of four, the allocation for bread amounts to a total of 126 slices or 5.73 loaf per week (Table 2). Thus, a family can **save from \$9.05 to \$10.20 per week by making its own bread.**

[Ⓢ] Recette Pain maison – Recettes du Québec : <http://www.recettes.qc.ca/recettes/recette.php?id=3794>

INFANT FORMULA

The cost of infant formula is higher in inland communities. This is probably a function of availability. The applied cost is based on 'the cheapest of' a list of acceptable formula types (powder, concentrated liquid, and ready-to-use) as recommended in the *Cahier de formation* (Appendix 2). This accounts for the fact that in one store in an inland community, the only formula available was the most expensive ready-to-use type (Appendix 5).

Traditional Food

Consumption of traditional food, acquired through hunting, fishing or picking berries is a way to improve the nutritional intake of a family. Game meats are rich in protein, iron, etc., and low in saturated fats. Fish is also a high-quality food; it is a major source of vitamin D and selenium, is low in saturated fat and cholesterol but high in omega-3 fats. However, high cost of these activities to obtain traditional foods, especially hunting¹⁶, should be kept in mind when budgeting for food.

Cost of the NFB per Group of Age, Sex and Physiological Condition

In accordance with the cost of the food categories, the cost of the NFB per group of age, sex and physiological condition is higher in the coastal communities in comparison with the inland ones.

Weekly allowances of the NFB categories (Table 2) are based on the nutritional needs of each group of age and sex as well as those of two physiological conditions: pregnancy and lactation. Being pregnant or lactating increases the nutritional needs of women, and this translates into a higher cost of the NFB, differences ranging from ≈ \$7 to \$10 per week (Table 8). It is a non-pregnant non-lactating woman who was considered in Figure 5 and Figure 6. As the proportions of income needed to purchase the NFB would increase accordingly to these physiological conditions, these would put at risk the vulnerable foetus and infant.

In a public health point of view, it is of utmost importance to satisfy the high energy and protein needs of pregnant and lactating women to ensure a healthy start in life for the next generation. The long-term positive effects of a healthy weight at birth^{43,44} and breastfeeding^{45,46,47} support that every possible action be taken to ensure that women satisfy their nutritional needs in these periods.

Economical Advantage of Breastfeeding

In addition to its health benefits, breastfeeding also presents an economical advantage. Data on Table 8 illustrate the cost per week for satisfying the additional nutritional needs of a breastfeeding woman in coastal and inland, respectively, Eeyou Istchee communities:

- \$7.90 and \$6.63 if she is 18 years old or younger;
- \$9.17 and \$7.55 if she is 19 to 30;
- \$10.05 and \$8.21 if she is 31 to 50.

In comparison, the average weekly cost of formula is \$42.84 (± \$3.13) in coastal communities and \$60.42 (± \$15.63) in inland ones.

Thus, breastfeeding represents a saving of at least \$30 per week.

Cost of the NFB

For the cost of the NFB in Eeyou Istchee to be comparable to other areas, it was necessary to attribute a price for the missing NFB items. The only items that were not available in any of the 16 stores of the region were dry red kidney beans and flaxseed. For these two items that represent 0.5% of the cost of the NFB, the price used was their median price in *Jamésie*.

Unless otherwise specified, the cost of the NFB refers to the weekly cost of the NFB for the MDD reference family of four.

The average cost of the NFB for the MDD reference family of four in Eeyou Istchee is \$312.47. However a considerable difference was detected between the cost of the NFB in inland communities (\$268.73) compared to coastal ones (\$338.71) (Table 9). This difference of nearly \$70 is statistically significant (Figure 4). Among the inland communities, the cost of the NFB ranged from \$244.07 in Mistissini to \$282.53 in Waswanipi (not considering Oujé-Bougoumou where it is not possible to make up the NFB). Among the coastal communities, the cost of the NFB ranged from \$298.74 in Chisasibi to \$398.78 in Whapmagoostui.

As Eeyouch families often have more than two children, the cost of the NFB was established for a more representative family of six comprising a couple with four children. Using the data on Table 8, the cost of the NFB for this family amounts to \$418.41 in average for all Eeyou Istchee communities, with a difference of nearly \$100 between inland communities at \$359.64 and coastal ones where it is \$453.66.

As previously mentioned, the difference in the NFB cost between coastal and inland communities may be linked to transportation cost.

The Nutrition North Canada Program⁴¹

It is not surprising that the highest cost was seen in Whapmagoostui, as this community is solely accessible by plane and boat. A subsidies program, such as the Nutrition North Canada (NNC) Program, may succeed at improving access to perishable, healthy food. Important price reductions were noted on some highly nutritive foods, namely milk (61%), ground beef (17%), oranges (33 %), apples (36%) and potatoes (50%) as seen on page 17. In spite of the incompleteness of the information gathered in only one store in Whapmagoostui, the difference in the cost of the NFB in this store was calculated. The NNC program reduced this cost from \$403.86 to at least \$316.24. This reduction in food cost brings the price of the NFB close to the average cost of the NFB in Eeyou Istchee, which is \$312.47.

Effect of Store Size, Urbanization Classification, and Deprivation Index

No statistical significance was detected on the cost of the NFB when considering store size, urbanization classification, or deprivation index in Eeyou Istchee.

Nevertheless, it is interesting to note, on Table 4 and Table 9, that the lowest NFB costs were observed in the most populous communities and larger stores:

- in the coastal communities, in Chisasibi, home of 4,484 people⁴⁸, in which one of the store size was 8,700 sq.ft;
- in the inland communities, in Mistissini with a population of 3,427⁴⁸, and in which there was the only store over 10,001 sq.ft. in Eeyou Istchee.

Cost of the NFB in the Economical Context of Eeyou Istchee Families

In 2009, in Quebec, average-income households spent \$7,143 per year for food while low-income households (before-tax income of \$25,000 or less) spent \$3,810 \$. These amounts respectively represented 16.8% and 19.8 % of the total annual current-consumption spending of the average-income and low-income households.⁴⁹

Every year, the MDD publishes the cost of what is needed for a Minimum Adequate Standard of Living²⁴. The various items included in this calculation are basic goods and services (rent, food, clothing, etc.) needed to maintain health. In 2009, the cost of these goods and services was established at \$29,160 for the MDD typical family of four, with the following distribution: 34.1% for food (represented by the NFB), 31.1% for rent and 34.8% for all other items.

From the above data, it appears that low-income households in general are at risk of food insecurity. In Eeyou Istchee, due to the high cost of food combined with incomes lower than in other regions – and even lower than the MDD Minimum Adequate Standard of Living –, a higher proportion of income would need to be spent for the NFB when, in fact, households spend less than 20% of their income on food⁴⁹. While food insecurity is of concern for the average-income single-parent family, it is of great concern for all low-income families.

To evaluate the cost of the NFB in the economical context of Eeyouch families, data on the after-tax median income⁴⁰ was used in this report as it more or less represents the amount available to households for the consumption of goods and services. The data used was established for families with two children (MDD reference family) as well as families with three or more children, the latter being more representative of Eeyouch families. The average after-tax median income of the following types of families was considered:

- average-income family comprising a couple;
- average-income single-parent family;
- low-income family comprising a couple;
- low-income single-parent family.

For average-income families comprising a couple, the cost of the NFB in Eeyou Istchee occupied 21% (Figure 5) of the after-tax median income of families with two children and 29% of those with three or more children (Figure 6). If these families purchase their NFB items in *Jamésie*, where the cost of food is cheaper, these proportions would be reduced to 15% (Figure 10) and 21% (Figure 11), respectively. Thus, for Eeyouch families, purchasing the NFB in *Jamésie* may be advantageous so long as transportation does not exceed the potential savings, which is approximately \$110 per week for families in the coastal communities and \$40 per week for the inland ones (Figure 8). Note that the above 15% (Figure 10) is very close to the situation in *Jamésie* where the proportion of the after-tax median income occupied by the cost of the NFB is 14 % for the average-income family comprising a couple (Figure 7) as well as in the MDD three-region study²⁵.

For Eeyouch, purchasing food in *Jamésie* may reduce NFB cost considerably, so long as cost of transportation does not exceed the potential savings.

Figures 5, 6, 10 and 11 illustrate the proportion of the after-tax median income needed for Eeyouch families to buy the NFB. Although the percentages vary, a general trend is observed. In comparison with the average-income family comprising a couple, the proportion of the income represented by the cost of the NFB is:

- twice as high for the average-income single-parent family;
- between 2½ to 4 times as high for low-income families.

Thus:

- for the Eeyouch average-income single-parent family, purchasing the NFB greatly reduces its possibility of acquiring other goods and services;
- for low-income families, purchasing the NFB appears to be impossible.

In Eeyou Istchee, the NFB is not accessible to low-income families.

Whether they purchase food in their own community or in *Jamésie*, food security is jeopardized for these families.

COMPARISON OF THE COST OF THE NFB IN EYYOU ISTCHEE AND OTHER AREAS

As mentioned previously, the "ACCESS TO A NUTRITIOUS FOOD BASKET IN EYYOU ISTCHEE" project included price tallying in five (5) *Jamésie* stores and three (3) stores in urban centres in Abitibi. In addition to the results obtained in these stores, we will also consider those obtained in the most recent MDD study conducted in three regions of Quebec²⁵ as well as the cost of the NFB in Montreal in September 2011¹⁸.

Comparison of the Stores

While 11 out of 16 stores surveyed in Eeyou Istchee were small, i.e. ≤ 4,000 sq.ft (Table 3), all *Jamésie* (Table 10) and Abitibi stores were classified as large in size. In the MDD three-region study, nine (9) of 31 stores in the remote *Côte-Nord* region were small²⁵.

According to the classification of urbanization levels (Figure 1), Eeyou Istchee and *Jamésie* are rural communities, i.e. with less than 10,000 people (Table 3 and Table 10). In the MDD three-region study²⁵, the *Côte-Nord* region was somewhat similar with a majority of stores (26 out of 31) in rural settings. The three Abitibi stores surveyed in the present project were in urban areas.

Availability of the NFB Individual Items

In Eeyou Istchee stores, 23.8% of the NFB items were not available (text on page 14). Not surprisingly, in the MDD three-region study, the *Côte-Nord* was the one with the most NFB items missing (11%). In the present project, there are very few NFB items that were missing in the *Jamésie* and Abitibi stores.

Expiration Date

In the MDD three-region study²⁵ as well as in the present project, the expiration date was verified for the following items: milk, cheese, eggs and bread. While no items surveyed in the study herein were beyond their expiration date, some were identified in the three-region study, particularly in the *Côte-Nord* region.

Cost of the NFB

The cost of the NFB was \$86.26 higher in Eeyou Istchee (Figure 8) compared to its cost in *Jamésie*. When the stores from the coastal communities were only considered, the difference raised to \$112.50 (Figure 9); both of these differences were statistically significant. The difference between the cost of the NFB in all overall stores in Eeyou Istchee and *Jamésie* was comparable to the difference between Eeyou Istchee and the three Abitibi stores (page 29).

In Montreal, the cost of the NFB established by the MDD in September 2011 was \$207.72. This is almost \$20 less than in *Jamésie* (\$226.21), with slightly less differences with the three stores in Abitibi. The difference in the cost of the NFB between Eeyou Istchee and Montreal amounts to \$104.75 more, and \$130.99 more in the coastal communities alone.

Adjusted to 2011[Ⓢ], the cost of the NFB in the *Capitale-Nationale* region (\$214.03) and *Mauricie/Centre-du-Québec* (\$215.46) is more or less half-way between Montreal (\$207.72) and *Jamésie* (\$226.25).

At \$250.23, the 2011 adjusted NFB cost[Ⓢ] in the *Côte-Nord* is lower than in Eeyou Istchee; in the stores that are not accessible by land, it amounts to \$281.48 which is still lower than in Eeyou Istchee as a whole (\$312.47) and the coastal communities (\$338.71), but higher compared with inland stores (\$268.73).

Thus, the cost of the NFB in Eeyou Istchee is higher than any other studied regions in the province of Quebec, with the exception of the 11 remote stores of the *Côte-Nord* region not accessible by land. Transportation cost may explain this situation.

In Eeyou Istchee, the cost of the NFB is the highest of any studied region in Quebec.

Cost of the NFB in the Economical Context of Families

After-tax median income corresponds to the amount available for consumption spending (food, housing, clothes, transportation, etc.). The measure in 2009 (the latest available)⁴⁰ was used to verify which proportion of the families' budget was represented by the cost of the NFB for the following four family types:

- average family of four: two adults and two children;
- average single-parent family with two children;
- low-income family of four: two adults and two children;
- low-income single-parent family with two children.

In 2009, the after-tax median income of these four family types was:

- in Eeyou Istchee: \$77,630, \$29,150, \$20,060, and \$16,470 (Figure 5);
- in *Jamésie*: \$83,330, \$38,970, \$20,680, and \$18,020 (Figure 7);
- in the *Côte-Nord*: \$85,440, \$32,300, \$19,690, and \$15,870⁵⁰.

In general, Eeyouch families tend to have a lower income than families of other regions, with the exception of the low-income families in the *Côte-Nord*.

[Ⓢ] The 10.6% increase (from 2009 to 2011) in the Montreal NFB cost (from \$187.85 to \$207.72) was applied to the MDD three-region study.

The proportion of the after-tax median income of these four types of families occupied by the cost of the NFB is, respectively:

- in Eeyou Istchee: 21%, 44%, 81%, and 77% (Figure 5);
- in *Jamésie*: 14%, 20%, 57%, and 51% (Figure 7);
- in the *Côte-Nord*: 14%, 29%, 59%, and 58%⁵⁰.

The higher proportions observed in Eeyou Istchee are explained by the higher cost of the NFB, combined with the lower Eeyouch's after-tax median income.

For the types of families considered, Eeyouch are always required to use a larger percentage of their after-tax income to acquire the NFB, compared to other regions. This is of particular concern for the average-income single-parent family, and especially for the low-income families for whom eating well appears practically out of reach on the basis of the data collected.

In Eeyou Istchee, eating well is of concern for the average-income single-parent family while it appears to be out of reach for low-income families.

CONCLUSION

The main mandate of this project was to establish the cost and availability of the Nutritious Food Basket items in the stores of Eeyou Istchee and nearby urban centres in which Eeyouch regularly purchase their food.

The project confirmed that the cost of the NFB is higher in Eeyou Istchee than in *Jamésie* and in three stores in Abitibi as well as in studied regions of Quebec (Montreal, 2006 / *Capitale-Nationale, Côte-Nord, Mauricie-Centre-du-Québec*, 2011). Furthermore, within Eeyou Istchee, it costs more to buy the NFB in the coastal communities than inland.

The level of income in Eeyou Istchee families tends to be lower than anywhere else in Quebec. The NFB requires a much too high percentage ($\geq 74\%$) of the income of low-income families who are at great risk of food insecurity. Average-income single-parent families, respectively with two children and with three or more children, need to use 44 % and 54 % of their income to purchase the NFB, proportions that are also too high to ensure food security.

In addition, availability of items from NFB is limited, particularly in small stores. For certain Eeyouch, nutritious food access may remain a problem if not available in their own community. In such a case, transportation is a pivotal factor to get food, and travel costs must be added to food cost.

Thus, food insecurity is present in Eeyou Istchee, jeopardizing the nutritional status of part of the population. The main factors linked to food insecurity are income as well as the cost and availability of food. The subsidy program "Nutrition North Canada" has shown to substantially decrease the price of food items in Whapmagoostui during the survey. Such a program could be an effective way to reduce the NFB cost in all Eeyou Istchee communities.

It is of utmost importance to improve food security in Eeyou Istchee, in order to prevent chronic diseases. Results of this project should provide a foundation to obtain better supply and availability of high-quality foods in each community of Eeyou Istchee, as well as to decrease the cost of some of the NFB items. Alongside the work with the store managers, it will remain essential to improve "food access" to all Eeyouch. Because accessibility is more than food being available, education should also be one of the main components to improve food access. This could be done by:

- Providing perinatal nutrition counselling to low-income families and promoting and supporting breastfeeding;
- Helping people make healthy choices at point of purchase (for example through grocery tours);
- Developing basic cooking skill, so Eeyouch can fully benefit from NFB cost and avoid buying prepackaged or prepared food that are more expensive and less nutritious;
- Building capacities in budget planning.

Writers hope that these results will influence policies and serve as guidance to reduce poverty, mainly when planning interventions to prevent food insecurity.

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