



# FOOD CONSUMPTION PATTERNS AND SOCIOECONOMIC FACTORS AMONG THE INUIT OF NUNAVIK

GÉRARD DUHAIME<sup>1</sup>, MARCELLE CHABOT<sup>2</sup>  
and MARCO GAUDREAU<sup>3</sup>

<sup>1</sup>*Groupe d'études inuit et circumpolaire (GÉ TIC), Université Laval;*

<sup>2</sup>*INRS-Urbanisation, Culture et Société;*

<sup>3</sup>*Research Professional*

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This article examines the dietary patterns of the Inuit of Nunavik, based on data from a 1992 Government of Quebec survey. Using data primarily from the Food Frequency questionnaire on a sample of 178 women between 18 and 74 years of age, the study investigates the role of various socioeconomic factors and the influence of the socioeconomic status of the household to which each woman belongs. These factors are analyzed in relation to the proportion of traditional or industrial foods consumed by respondents. The study shows that the presence of a male head of the household and, to a lesser extent, access to an income, raise the proportion of country foods in the diet. Other findings reveal that the main mechanisms for the distribution of country foods, such as sharing practices and a community freezer, play a significant role, but do not compensate when the above two conditions are not found in households.

**KEY WORDS:** Inuit, Nunavik, food consumption, socioeconomic factors, households, food changes, traditional foods, industrial foods

## INTRODUCTION

The diet of the Inuit living in Northern Canada is changing from a traditional one, consisting of food from domestic harvesting activities, to one which includes more and more industrial foods

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Address correspondence to Gérard Duhaime, Groupe d'études inuit et circumpolaire (GÉ TIC), Université Laval. E-mail: gerard.duhaime@fss.ulaval.ca

imported from southern markets (Wein, 1986; Kuhnlein, 1989; Moffatt *et al.*, 1991; Freeman *et al.*, 1992; Wein and Freeman, 1992; Delisle *et al.*, 1994; Lawn and Langner, 1994a,b; Bégin and Parent, 1995; Kuhnlein, 1995; Kuhnlein *et al.*, 1995, 1996). This change, which is already well established (Nutrition Canada, 1977), is the consequence of a greater exposure to industrial foods through increased availability the media and education, and of the transformation of traditional lifestyles, sedentarization and the decline of foraging activities (Wein, 1986; Kuhnlein, 1990).

Despite these dietary changes, traditional or country foods still constitute a significant portion of the Inuit diet (Kuhnlein, 1989; Freeman *et al.*, 1992; Wein and Freeman, 1992; Delisle *et al.*, 1994; Lawn and Langner, 1994a,b; Bégin and Parent, 1995; Kuhnlein, 1995; Kuhnlein *et al.*, 1995, 1996). It has been found that the level of protein intake is higher than that of the average Canadian; and this difference between Inuit and southern populations is correlated with the consumption of country foods (Lawn and Langner, 1994a; Bégin and Parent, 1995). Moreover, high concentrations of pollutants in the blood and tissues of the Inuit and in the milk of breast-feeding mothers indicate that they still eat significant quantities of marine mammals and fish (Kinloch and Kuhnlein, 1987; Kinloch *et al.*, 1992; Dewailly *et al.*, 1992, 1994).

The Inuit eat considerable quantities of industrial foods. Today, their diet is richer in refined sugars and saturated fatty acids from store-bought foods. While the diet was traditionally based on protein from country meats, recent studies show that a major part of the energy and micronutrients procured comes from industrial foods (Kuhnlein, 1989; Lawn and Langner, 1994a,b; Bégin and Parent, 1995). A growing inclination toward industrial foods is recognized especially among younger generations (Wein, 1986; Kuhnlein, 1989; Moffatt *et al.*, 1991; Freeman *et al.*, 1992; Delisle *et al.*, 1994; Bégin and Parent, 1995; Condon *et al.*, 1995; Wein *et al.*, 1996).

Given these findings, the general perceptions are that the Inuit eat mainly, if not only, country foods. Many studies emphasizing the cultural and the socioeconomic role of country foods for the Inuit and northern Native peoples, especially in anthropological literature, have helped to convey this idea (Wein *et al.*, 1989). For

instance, there is an abundance of literature, focusing on traditional diet and beliefs about food, which highlights the symbolic and cultural importance and role of country foods (e.g. Borré, 1991; Freeman, 1988a,b, 1996; Poirier and Brooke, 1997). On the other hand, very few studies on the traditional economies of Inuit villages or households consider the exchange and consumption of grocery foods as part of the cost of reproduction of the labour force, or address the role of industrial foods in traditional activities (e.g. Quigley and McBride, 1987). Food harvesting data are sometimes employed to assess the food intake of the Inuit (e.g. Mackey and Orr, 1987; Usher and Wenzel, 1987; Gilman *et al.*, 1997). Although this approach provides valuable clues about domestic use of the harvest, it is incomplete in its representation of the actual dietary patterns of the contemporary Inuit (Kuhnlein and Soueida, 1992; Wein *et al.*, 1991; Wein and Freeman, 1995). Nutrition science methods have also been used to characterize food intake, although many of these studies tend to focus especially on country foods. Indeed, even if most of them have clearly established the role of industrial foods in the Inuit diet, results from surveys based on food frequency or food preference questionnaires, carried out with Aboriginal populations, conclude that, in general, the Inuit eat more and place more value on country foods than industrial foods (Lévesque, 1991; Moffatt *et al.*, 1991; Freeman *et al.*, 1992; Kuhnlein and Soueida, 1992; Condon *et al.*, 1995; Wein *et al.*, 1996). Some observers consider that the results gathered from the food preference method should be used as indicators of cultural values associated with food, and should not be used solely to predict food consumption (Wein, 1995; Wein and Freeman, 1995). The key aspect here is that the existing literature on the Inuit diet seems to perpetuate the belief in the traditional image of the “Inuit eater of raw country meat”.

Country foods still hold their cultural, social and economic importance, which is regularly reassessed in public discourse about contemporary life. Industrial foods also have their own significance, which largely remains to be explored in such a context. For example, Wein *et al.* (1989) found that, for an Aboriginal population in the Northwest Territories, imported fresh fruits and vegetables were considered just as healthy as country foods.

The purpose of this article is to investigate Inuit dietary patterns in terms of the quantities of country foods as well as industrial foods consumed. We also examine some socioeconomic factors which may influence the ratio of these two types of foods in the diet. This will lead to conclusions about links between social practices and food practices in contemporary Inuit life.

## FOOD CONSUMPTION AND SOCIOECONOMIC FACTORS

Recent studies on the nutrition of the Inuit of Nunavik give a contemporary picture of their eating patterns. A nutritional survey was carried out in 1992 (Quebec Health Survey), using both the *24-Hour Diet Recall* and *Food Frequency Interview* methods. According to the 24-Hour Diet Recall questionnaire, the Inuit eat an average of between 170 g and 365 g of country foods per day, depending on gender and age, relative to a total daily food intake of 2,121 g to 2,737 g. This represents a small portion of the total food intake, including liquids, but constitutes a large portion of the total meat intake (Lawn and Langner, 1994b). These findings appear to be comparable to the food intake of other Inuit populations in Canada (Kuhnlein, 1989; Lawn and Langner, 1994a). If country meats appear to occupy a significant proportion of the diet, the importance of industrial foods is considerable. However, the range of consumption can vary widely from one individual to another. Using a 24-Hour Diet Recall questionnaire administered for six periods during one year ( $n=430$ , with 60–70% participation), Kuhnlein (1989) found that, in the community studied, country food consumption varied, on average, from 300 to 700 g per day. Age and gender have been clearly identified as factors affecting food consumption patterns (Kuhnlein, 1989; Moffatt *et al.*, 1991; Wein and Freeman, 1992; Lawn and Langner, 1994a,b; Kuhnlein *et al.*, 1996). Other factors are also involved in the determination of food practices.

Today, the Inuit are part of a pluralistic society, where a traditional way of life and traditional values can no longer explain all practices. Access to markets, the development of wage earning

and an increase in monetary income have all helped to produce greater diversity in food consumption behaviours. Country food consumption, which in Nunavik and Northern Canada is still mainly supplied through domestic production, is affected by seasonal access to wildlife resources (Kuhnlein, 1989; Lévesque, 1991; Freeman *et al.*, 1992; Kuhnlein *et al.*, 1996; Dewailly *et al.*, 1998). However, changes in the means of production have in fact increased accessibility. For example, it has been demonstrated that income, and therefore the acquisition of equipment, influence the level of harvesting (Mackey and Orr, 1987; Smith and Wright, 1989; Condon *et al.*, 1995). This conclusion might suggest that households which produce more food are likely to eat more country foods. Indeed, a food consumption survey in the Northwest Territories, based on 24-Hour Diet Recall and Food Frequency questionnaires administered to women between 15 and 44 years of age in eight different communities ( $n=398$ ), reported that the main reasons given for not being able to obtain country foods all year round were linked to the high cost of hunting and fishing equipment and maintenance (Lawn and Langner, 1994a). Access to monetary income may therefore be seen as a critical factor in country food consumption.

Given that production activities in Inuit society are still mainly performed by male hunters, the presence and availability of males might affect the access to and use of country foods. Reasons given by Inuit respondents in the food consumption survey in the Northwest Territories for not being able to obtain country foods include the absence of adult males or their lack of availability for hunting activities (Lawn and Langner, 1994a). In Nunavik, Lévesque (1991) has suggested that the supply of country meat may correlate with the occupation of males in the household. For Wein *et al.* (1991), this factor was the most significant variable with respect to the supply of country meat among some groups of Aboriginal peoples and Métis in the boreal forest of the Northwest Territories, who also produce important quantities of country foods.

Markets and informal exchanges or sharing are also factors that influence food consumption. For example, the fact that a large proportion of the respondents in the Lawn and Langner (1994a,b) studies could obtain country foods all year round may be a result

of sharing practices, even if many respondents could not hunt regularly due to high costs. Sharing is a very common behaviour among the Inuit of Canada today (Freeman *et al.*, 1992; Wenzel, 1995; Freeman, 1996; Kishigami, 2000; Lévesque and De Juriew, 2000). The use of a community freezer, in Nunavik, and elsewhere in Northern Canada, has also been identified as a means that enables some people to compensate for the lack of food and extend the seasonal availability of country foods (Wein and Freeman, 1992; Delisle *et al.*, 1994). In Greenland, where markets for country foods are more developed, the Inuit who cannot afford the equipment to hunt large marine mammals can obtain whale products at the local market (Caulfield, 1993).

Food consumption is also influenced by the accessibility of industrial foods (Kuhnlein, 1989; Dewailly *et al.*, 1998). Industrial foods are sold in local stores and their availability depends on transportation and local market infrastructures. Imported industrial foods are very costly in Northern Canada. For households, therefore, monetary income is a critical factor. For instance, Lawn and Langner (1994a) reported that an average household in the Northwest Territories spent about \$1,000 on groceries each month. In Nunavik, a recent study showed that, in 1995, each Inuit household spent an average of 44% of their gross monetary income on groceries (Duhaime *et al.*, 1998). These findings illustrate the importance of industrial foods in the household's budget and diet. Other studies have shown that hunting and fishing activities cost less than purchasing food at the store (Smith and Wright, 1989; Wenzel, 1991; Smith, 1991; Duhaime *et al.*, 1998); in Nunavik, the cost of these activities is estimated at an average of 11% of monetary income (Duhaime *et al.*, 1998). This result indicates that, for households today, the selection of food implies making choices between producing food or simply consuming it. It also implies the need to choose between available country foods and industrial foods.

The lack of money for harvesting activities and grocery-store purchases is a major issue for the Inuit population. According to Lawn and Langner (1994a), a large proportion of the respondents in the Northwest Territories (80%) reported running out of money for food. Not having enough to eat in the house in the month

preceding the survey was also mentioned by many respondents. On the other hand, most respondents stated that access to country foods was not a problem for them. This might suggest that Inuit households rely on store-bought food and that country foods do not make up for the lack of food in the house.

Finally, another major factor that influences the Inuit diet is the convenience of industrial foods. In the Quebec Health Survey, 60% of the respondents reported buying *convenience or prepared foods* at least some of the time. The main reason given by the respondents to explain this kind of purchase was *the lack of time* or because it was *easier* (64%). Only 15% mentioned the fact that they could not get country foods as a reason for using convenience foods (Delisle *et al.*, 1994).

In sum, contemporary food consumption is a mix of local products (from household food production, exchanges through social networks and, to a lesser extent, market exchanges) and imported industrial products. The ratio between country foods and industrial foods appears to be related to factors that are more or less beyond the control of the social actors involved, such as age and gender and the availability of natural resources, as well as to certain characteristics that are closely linked to social status, including household composition (being a male or living with a male hunter, or not), social integration providing access to food sharing, household income, and local market prices. All of these influence daily decisions about ways of facing food needs.

Using data from the Quebec Health Survey, we intend to characterize the Inuit diet, and to verify the predictive potential of some of these major factors.

## DATA AND METHODOLOGY

### *Tools*

The data used here are taken from the Quebec Health Survey on the Inuit performed in the fall of 1992. The aim of the survey was to produce an overall profile of the state of health of the Inuit of Nunavik in order to develop key indicators of their general level

of health by determining the prevalence and nature of physical and mental health problems, including nutrition. Various methods were used for data collection (interviews, self-administered questionnaires as well as clinical and nutritional-type interviews), employing seven survey tools adapted from the 1987 Quebec Health Survey on the Quebec population. A sample of 400 households, out of a total of 1,378 households (29% on average in each village), is included in the survey. To ensure that the results would be representative of the population of all the villages, the population was stratified according to the 14 villages, and then further stratified by village, with a quasi-proportional representation of the number of households in each stratum. The sampling design developed by the Quebec Statistics Institute targeted a margin of error of  $\pm 10\%$  for all prevalences for the 14 Nunavik localities. An average of 67% of the households agreed to take part in the survey, although several could not be contacted, which reduced the response rate. This rate varies for the different questionnaires, but is about 54% on average (Jetté *et al.* [n.d.]) (Table I). It should be noted that the problems experienced in contacting the sample population were underestimated by the survey's designers (Jetté and Godbout, 1994).

The main survey data derived from several questionnaires are gathered in the main database: *Enquête auprès des Inuits du Nunavik 1992* (SPSS/PC, December 1994). This database contains data derived from other survey tools which are linked together based on each participant's identification number. It contains, among other elements, variables such as individuals' socioeconomic characteristics (age, gender, income, household composition, etc.), diet and lifestyle.

TABLE I  
Sample size, participation rate and response rate

	Main survey	Food frequency survey	This study survey
<i>Total Inuit households (n=1,378)</i>			
Sample size	400	228	178
Average participation rate	67%	67.3%	—
Response rate	54%	53.7%	—



The Quebec Health Survey data on nutrition among the Inuit were generated by using two questionnaires: a Food Frequency questionnaire and a 24-Hour Diet Recall questionnaire. For this study, we used the Food Frequency questionnaire data, which are gathered in a data bank: *Frequency Bank* (SPSS/PC, August 1995). The Food Frequency questionnaire was targeted to women<sup>1</sup> between the ages of 18 and 74, who were not pregnant or breast-feeding. The participation rate for this questionnaire was 67.3%, with a response rate of 53.7%. A total of 228 women participated in the Food Frequency questionnaire. Nutrition interviews were conducted in English and Inuttitut (the language of the Inuit of Nunavik) by a nurse with an interpreter, between September 17 and December 1, 1992. The questionnaire includes a list of 23 country foods (or local foods from the land) and 44 industrial foods (*see* Appendix). For each food, the frequency in terms of portions per season is recorded. For the purposes of this study, only one respondent per household has been retained, for a total of 178 women.<sup>2</sup> The estimation bias is  $\pm 7.35\%$ <sup>3</sup> (Table I). It should be noted that this questionnaire was often perceived by the Inuit respondents as long and difficult to answer; it was also the seventh and final survey questionnaire that households which had agreed to take part, had to answer. Moreover, it is possible that the questions were not always translated uniformly, with the respondent's weariness possibly influencing the interpreter's work (Jetté and Thibault, 1995).

From the two databases, variables have been selected in order to develop a typology of households. The purpose of such a typology is to outline the household environment of the 178 women. The typology is based on the household composition and the occupation of the heads of the household. The latter was considered a

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<sup>1</sup>Excluding women living in a household consisting of only non-Inuit people or living in an institution (i.e., a hospital or prison).

<sup>2</sup> $n = 179$ , less one respondent rejected due to a lack of answers.

<sup>3</sup>The maximum estimation error of a proportion is calculated using a proportion of 0.50 at a 95% confidence level. The more the estimation differs from 0.50, the smaller the estimation error.

TABLE II  
Distribution of respondents by age group and type of household to which they belong ( $n = 178$ )

Age group	Type of household					Total <i>n</i>
	Two-parent/father working (Type 1)	Two-parent/only mother working (Type 2)	Two-parent/no head working (Type 3)	Single-parent/mother working (Type 4)	Single-parent/mother not working (Type 5)	
18–29	15	2	8	2	4	31
30–39	31	5	8	9	3	56
40–49	18	6	5	5	4	38
50–59	11	3	10	2	1	27
60–69	8	1	4	3	9	25
70–74	0	0	0	0	1	1
Total	83	17	35	21	22	178
%	46.6	9.6	19.7	11.8	12.4	100.0

good indicator of the household's economic situation. The typology is made up of five types of households, described as follows:

Type 1: A household wherein the main family<sup>4</sup> is composed of two parents (or a single parent who is a male), and where the father or both the father and the mother are wage earners.

Type 2: A household wherein the main family is composed of two parents, and where the mother is the only wage earner.

Type 3: A household wherein the main family is composed of two parents (or a single parent who is a male), and where neither the father nor the mother are wage earners.

<sup>4</sup>A *family* is defined as a married or unmarried couple (two-parent family) or single parent living with their unmarried children. A *main family* is defined as the family upon which all members of the household seem to depend. The dependence relationship is defined according to the capacity of certain members to make decisions about expenses. This capacity is linked to age, status in the household, and income.

Type 4: A household wherein the main family is composed of a single parent or a single person, and whose head is a female wage earner.

Type 5: A household wherein the main family is composed of a single parent or a single person, and whose head is a female non wage earner.

This typology appears to be a valid classification for analyzing the household's economic and food behaviour patterns. The distribution of the 178 women according to this typology is shown in Table II.

### *Analytical Approach*

In order to assess the food consumption of the 178 women, two indicators were selected:

1. The proportion of country foods (meat and wild berries) consumed by the respondent, out of the total quantity of foods ingested, excluding liquids (country foods/all foods).
2. The proportion of country foods (meat and wild berries) consumed by the respondent, out of the total quantity of meats ingested (country foods/all meats).

In this study, we will address two questions. We will first describe and characterize the respondents' diet. Secondly, we will explore the relations between the two above mentioned indicators and several other variables drawn from the main database, which are as follows:

1. Lacking food in the house.
2. Obtaining country foods from the community freezer.
3. The number of *potential hunters* (males between 17 and 70 years of age); this independent variable has been regarded as a predictor of food productivity.
4. The number of wage earners in the household; this independent variable is used as an indicator of the household's economic situation.

5. Being a single-parent mother.
6. The typology of households; this independent variable combines both the occupation of the heads of the household and the household composition.

### *Study Limitations*

Use and interpretation of the data from the Quebec Health Survey calls for some prudence. First, in the survey, foods and beverages referred to in the questionnaire were chosen for a specific purpose: they were selected in order to establish links between diet and morbidity, and especially to gather information related to cardiovascular diseases. Therefore, fatty foods are accorded a special place in the questionnaire. Some foods were not considered in the survey: for example, freshwater fish (e.g. lake trout, brook trout, whitefish). And yet, these species accounted for 10% of all country foods harvested, in edible weight, according to the harvesting study carried out in 1976–1980 in Nunavik (Juniper, 1988). This omission may result in an underestimation of the total proportion of country foods in the diet. Nor are there any data on the consumption of other beverages, such as tea, which are very popular in Nunavik.

Bias may also come from the survey process itself and from the tools used to assess food consumption. Because a Food Frequency questionnaire is based on the memory of respondents who have to recall their food consumption for an entire year, the ability to remember may be a source of inaccuracy (Gibson, 1990). Nevertheless, the 24-Hour Diet Recall questionnaire, administered during the same period by the Quebec Health Survey team, yields similar results. This validates the results of the frequency questionnaire. The misinterpretation of some major concepts such as *food*, which can refer to *country food* in Inuttitut, might also produce false results. This is especially true for the portion of the household questionnaire that deals with food behaviours or perceptions, such as the question about *the lack of food in the house*, and that has been used for the present study. Finally, some bias may have occurred in relation to the fact that the nutrition questionnaires were administered at the end of the survey and were criticized for being too long.

## RESULTS AND DISCUSSION

*Composition of the Diet*

The average annual and daily food intake of an average woman participant in the survey is shown in Table III. It shows that, when considering all foods including liquids, industrial foods are the most important foods in the diet, in terms of weight. Country foods comprise 12.3% of all foods, with caribou and arctic char being the most popular of such foods. Liquid foods account for almost 50% of the weight of all foods. The most interesting result concerns the proportion of country foods relative to all meats consumed, which is 58%. This result shows the persistence of the consumption of this type of food in the diet.

TABLE III  
Average food consumption for Nunavik respondents ( $n = 178$ )

Types of foods	Kg per person per year	Grams per person per day	%
<i>Industrial foods—Total<sup>a</sup></i>			
Liquid foods	264.5	724.7	47.3
Solid foods except meat and bannock	135.3	370.7	24.2
Industrial meats	48.9	134.1	8.7
Bannock <sup>b</sup>	41.9	114.7	7.5
Total industrial foods	490.6	1,344.1	87.7
<i>Country foods<sup>a</sup></i>			
Caribou	19.9	54.5	3.6
Birds	14.7	40.2	2.6
Fish <sup>c</sup>	14.0	38.4	2.5
Marine mammals	13.4	36.7	2.4
Berries	6.7	17.3	1.2
Hare	<1	<1	0
Total country foods	68.7	188.2	12.3
Total	559.3	1,532.3	100.0

<sup>a</sup> See the list of foods in the appendix.

<sup>b</sup> Bannock: considered as traditional bread, made of flour, lard, salt, baking powder and water, and deep fried or cooked in lard or oil.

<sup>c</sup> Includes only arctic char and salmon.

Consequently, the following analyses do not consider the consumption of country foods in proportion to all foods including beverages ingested, because liquids take up a lot of weight. Thus, because we anticipated that the use of such an indicator could mask real differences in consumption patterns, we have only retained the two indicators that do not take liquids into account: the proportion of country foods to all solid foods; and the proportion of country foods to all meats consumed.

### *Diet Indicators*

The first indicator enables us to compare the consumption of country foods with the consumption of other solid foods. The distribution of respondents according to their consumption of country foods in proportion to all solid foods (excluding liquids) is shown in Figure 1. This bar chart indicates that, on average, one quarter of the entire solid diet is composed of country foods. Three aspects are of note here. First, the distribution shows that country food consumption is a widespread phenomenon. Secondly, the diet of 70.2% of the respondents is composed of between 10% and 40% of country foods, with most respondents coming close to the average (24.4%).<sup>5</sup> This suggests a low variation in food behaviours. Thirdly, only a very few respondents eat country foods primarily; only 5% of the respondents eat more than 50% of country meats.

The second indicator allows us to compare the proportion of country foods ingested—mainly meats—with all meats ingested (Figure 2). Based on a calculation from Table III, we see that country foods account for 58% of all meats consumed. When comparing the meat ratio, the results show greater variations<sup>6</sup> between respondents than in the case of the preceding indicator. This indicates that respondents do not behave uniformly when they choose country foods or industrial meats.

In sum, different results are obtained depending on the indicators chosen to examine the content of the Inuit diet. This first

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<sup>5</sup>Standard deviation = 14.7; kurtosis = 1.7; symmetry = 1.1.

<sup>6</sup>Standard deviation = 22.5; kurtosis = -0.8; symmetry = -0.3.

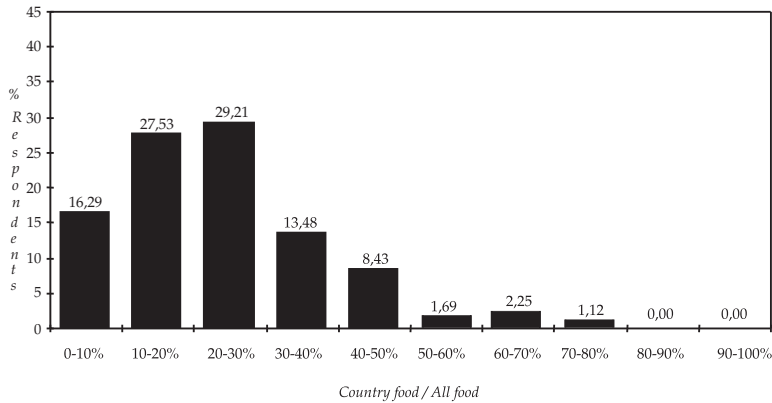


FIGURE 1 Distribution per decile of respondents according to their consumption of country foods in proportion to all foods consumed (excluding liquids).

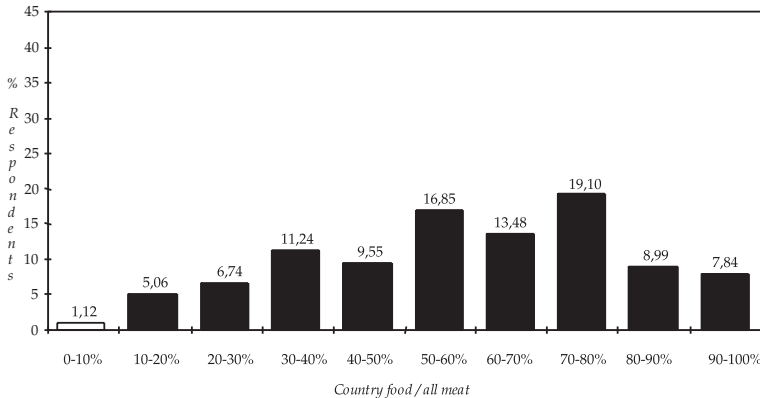


FIGURE 2 Distribution per decile of respondents according to their consumption of country foods in proportion to all meats consumed (excluding liquids).

level of analysis shows that the respondents do not behave identically. The differences in food consumption thus call for a second level of analysis. In the following pages, we will look at relations between the six previously listed socioeconomic factors and the respondents' diet (as defined by the two indicators described above:

the proportion of country foods to all solid foods, and the proportion of country foods to all meats). We will attempt to understand whether these factors can explain the differences found among the respondents with regard to the proportion of country foods and industrial foods.

### *Socioeconomic Factors and Food Patterns*

The correlations between the six factors and the respondents' diet are shown in Table IV. Cramer's V coefficient of association has been used.<sup>7</sup> Table IV shows the degree of correlation between each factor and food consumption. The number on the left indicates the coefficient of correlation (higher numbers indicate a higher degree of correlation). The level of significance is shown in parentheses (a high level of significance is less than 0.05). High correlations with a low probability of error are shown in bold.

TABLE IV  
Correlation between six factors and the respondents' food consumption

Factors	Correlation Cramer's V (sig.)	
	Proportion of country foods to all solid foods	Proportion of country foods to all meats
Being a single-parent mother heading the family	<b>0.18 (0.05)</b>	<b>0.22 (0.02)</b>
The fact of obtaining food from the community freezer	<b>0.18 (0.05)</b>	0.17 (0.07)
Typology of households	0.18 (0.15)	<b>0.24 (0.01)</b>
The presence of potential hunters in the household	0.11 (0.33)	0.15 (0.12)
The number of wage earners in the household	0.08 (0.71)	0.11 (0.40)
The fact of lacking food in the house	0.02 (0.96)	0.09 (0.53)

<sup>7</sup>Although Cramer's V is designed to estimate the degree of correlation between nominal variables, this coefficient of correlation is also used here to estimate relations between ordinal or metric variables in order to compare the strength of relations between independent and dependent variables.



When considering the indicators of the proportion of country foods in the diet in relation to the six factors selected, three factors show a high coefficient of correlation with a high level of significance. Belonging to a household with a single-parent mother heading the family and belonging to a household that obtains food from the community freezer are two factors correlated with the first indicator (country foods/all foods). Belonging to a household with a single-parent mother heading the family is also correlated with the second indicator (country foods/all meats). Finally, the combination of the gender of the household head(s) and his or her (their) occupation(s), expressed by the typology of the households, is strongly correlated with the second indicator (country foods/all meats).

In examining the uncorrelated results, our analysis shows that the number of males in the household does not explain the proportion of food consumed. We can argue that this lack of correlation might be due to the fact that it is not the number of potential hunters in the household that is a valid indicator, but rather the status of the hunters in the household. The high degree of association found between the proportion of country foods in the diet and the fact of belonging to a household with a single-parent mother heading the family might suggest that only the hunter head of the family, rather than the sons, really affects the household's food economy. These initial results seem to confirm a link between household production and the food consumption of its members.

The number of wage earners in the household does not appear to explain the respondents' food behaviour patterns. This does not necessarily imply that there is no relation between the household's economic situation and food consumption. This lack of correlation might suggest that the number of wage earners in the household is not an appropriate indicator for predicting diet, as we had expected it to be. This may instead point to the fact that it is not the number of wage earners that influences food consumption but rather the role of this individual in the household (i.e. father, mother). Indeed, as seen in the following table, we obtain different results when we consider the occupation of the heads of the household.

Finally, the coefficients of correlation in Table IV show that the fact of lacking food in the house (25.9% of the sampled households)

does not explain the proportion of country foods in the consumption pattern. This might suggest that the use of country foods does not compensate for the needs of those who experience a lack of food, who could belong to poorer households, as one might suppose.

We have already seen that three factors were correlated with the two indicators. We will now further explore these correlations. The proportions of country foods (country foods/all foods; country foods/all meats), are shown in Table V. These are when consider-

TABLE V  
Average proportion\* of country foods in the diet according to selected household characteristics

Household characteristics	Average proportion and standard deviation %	
	Proportion of country foods to all solid foods	Proportion of country foods to all meats
<i>The fact of obtaining country foods from the community freezer</i>		
Yes	23.3 (13.3)	55.9 <sup>f</sup> (22.0)
No	27.4 (17.9)	65.1 <sup>f</sup> (22.9)
<i>Being a single-parent mother heading the family</i>		
Yes	20.1 <sup>a</sup> (12.3)	52.2 <sup>g</sup> (22.6)
No	25.8 <sup>a</sup> (15.2)	60.3 <sup>g</sup> (21.3)
<i>Type of household</i>		
Two-parent/father working (Type 1)	25.1 <sup>b</sup> (15.9)	59.6 <sup>h</sup> (23.0)
Two-parent/only mother working (Type 2)	34.0 <sup>b,c,d,e</sup> (15.0)	74.3 <sup>h,i,j,k</sup> (17.4)
Two-parent/no head working (Type 3)	23.4 <sup>c</sup> (12.0)	55.1 <sup>i</sup> (21.5)
Single-parent/mother working (Type 4)	19.3 <sup>d</sup> (11.1)	51.5 <sup>j</sup> (19.0)
Single-parent/mother not working (Type 5)	20.9 <sup>e</sup> (13.5)	52.9 <sup>k</sup> (23.7)
All households	24.4 (14.7)	58.3 (22.5)

\*Based on T-tests, we can state that averages with the same letters in superscript are significantly different (95%).

ing, first, the fact of obtaining country foods from the community freezer; second, the fact of being a single-parent mother heading the family; and finally, the type of household the respondent lives in.

The central tendency measurements show that the respondents who obtain food from the community freezer are not the ones who eat the greatest amounts of country foods. Further analysis shows no relationship between obtaining food from the community freezer and lacking food (Cramer's  $V=0.15$ , sig. = 0.25). We can nevertheless question the role of the community freezer in the villages of Nunavik.

Food consumption also tends to be less in households headed by a single-parent mother. This is true, regardless of whether the single-parent mother earns wages or not (Types 4 and 5), as shown when looking at the types of households. This supports the conclusion that the economic situation is less significant than the fact of living with—or without—a male head of the household.

This latter result induced us to consider the importance of two significant conditions relative to the consumption of country foods. The first condition is the presence of a male head of the household as the main provider of country foods. The second condition is the availability of monetary resources, which usually come from paid work. These conclusions are confirmed when we consider the typology of households. The presence of a male head of the household appears to be a key factor. However, if the household does not earn enough income, for instance when neither of the heads is working (Type 3) or if the male head of the household is not fully available for harvesting activities (Type 1), the country food intake of the women is reduced. Thus, access to income also appears to play a certain role in the women's dietary patterns. Among women living in two-parent households, the women living in households where only the mother works (Type 2) are the ones who tend to eat more country foods. In this type of household, two necessary conditions contributing to maintenance of the means of production and the subsistence of the household are met: the male head of the household theoretically has more free time to hunt and fish, and the female head secures the earnings. As we suggested earlier, these results also highlight the relationship between food production factors and food consumption.

## SUMMARY AND CONCLUSIONS

This study confirms that, for the Quebec Health Survey respondents, food consumption patterns are characterized by a mix of local and imported foods. This has been shown elsewhere (Wein, 1986; Kuhnlein, 1989; Moffatt *et al.*, 1991; Freeman *et al.*, 1992; Wein and Freeman, 1992; Delisle *et al.*, 1994; Lawn and Langner, 1994a,b; Bégin and Parent, 1995; Kuhnlein, 1995; Kuhnlein *et al.*, 1995, 1996). The results confirm that country foods are still important: these foods represent more than half of all meats consumed. Given the fact that the Quebec Health Survey excluded many freshwater fish species, the quantities of country food may have been underestimated. The results also show the importance of industrial foods in the Inuit diet, a finding that can no longer be ignored.

The results concerning the ratio of country foods and industrial foods in the respondents' diet show a wide range of variation in behaviours. Some factors appear to have a substantial influence on food consumption, such as the presence of a male head of the family who is available for production activities, and a favourable economic situation provided by one of the heads of the household. When these two factors are combined, as in the case of Type 2 households (Table V), there is a high consumption of country foods. These types of households are indeed able to face the costs of both food purchases at the store and food production from the land, since the male head of the household theoretically has more free time to hunt and fish, and the female head secures the earnings. This is supported by existing literature, where it has been demonstrated that income, and therefore acquisition of the means of production, influences the level of harvesting and hunting and fishing activities (Mackey and Orr, 1987; Smith and Wright, 1989; Condon *et al.*, 1995). Also, Condon *et al.* (1995) found in their study of an Inuit community in Northern Canada that when the women have cash to invest in harvesting equipment, the effectiveness of the entire household's subsistence activities is increased.

What are the actual links between country food production and consumption patterns? Even if some clues are provided here, this question remains largely open to further research. For instance, a recent study (Chabot [to be published]) shows that a number of

persons who produce significant quantities of food also spend large amounts on groceries. The reasons for this behaviour seem to be linked, in part, to the presence of young children and adolescents in the household, whose food preferences tend more towards imported foods, a phenomenon that has already been identified (Lévesque, 1991; Freeman *et al.*, 1992; Lawn and Langner, 1994b; Bégin and Parent, 1995). Demographic factors such as household size and the individual's age thus influence food consumption practices. What is clear from all this, regarding production and consumption choices, is that both of these choices require a cash input and social acceptance of the symbolic values that these practices hold.

In examining the role of the community freezer, as well as sharing practices, we saw that in households where there are no males or no male heads of the household, the respondents were still able to eat country foods. This leads us to the conclusion that the community freezer and food sharing still play a major role for people unable to hunt due to the perpetuation of traditional roles or because of lack of monetary resources or time. In regard to the community freezer, the findings show that it is used by people who eat less country foods. Further analysis could explain the influence of specific factors, such as living in a household where the head is a single-parent mother, or the fact of lacking food. There is no doubt, when we consider the existing literature, that sharing is still active (Freeman *et al.*, 1992; Wenzel, 1995; Freeman, 1996; Kishigami, 2000; Lévesque and De Juriew, 2000), but the links between sharing practices, use of the community freezer, and poverty indicators (as defined for example by the fact of lacking food in the house) are not adequately known. Having experienced a lack of food is not correlated with the food consumption ratio. Given the fact that 26% of the respondents have had this kind of experience, this proportion appears to be an alarming one. However, the lack of precision in the survey concerning how respondents define their situation and the characteristics of the households involved makes any interpretation rather tentative. For instance, we do not know the characteristics of these episodes (e.g. frequencies), whether such households have less or greater access to efficient sharing networks, whether they

are using the community freezer, or whether they are more likely to be single-parent households. At best, this aspect requires further study.

In spite of this lack of precision, the large number of women who said that they lacked food remains a crucial result. It confirms one main conclusion of another study, where it has been shown that 55% of the gross monetary income of Nunavik households is devoted to food buying (44%) and food production (11%) (Duhaime *et al.*, 1998). This level of budgetary allocation to food parallels what has been observed in developing countries (e.g. Delgado, 1991; Kernel-Torres and Roca, 1991) and presently in Russia (Giroux, 1995); and the threshold of elasticity in this regard is more or less non-existent. It can be concluded that all the means of supply, including sharing practices, the community freezer, and market food (even when prices are subsidized to some extent), are not sufficient to guarantee food security for one quarter of the respondents.

The differences observed among households concerning the proportion of country foods in the diet do not seem to be attributable to a lack of food, or to different practices in regard to obtaining food from the community freezer. Our analyses highlight the fact that it is two-parent households where only the mother works that consume proportionally more country foods, whereas single-parent households consume the least amounts of country foods.

This study analyzes two household characteristics that could explain the consumption of country foods: firstly, the presence and availability of the father for food production activities, and secondly, access to monetary income to finance these activities. Households where these two elements are combined, such as Type 2 households, consume the most country foods. The presence of the father is thus an influential factor, but not a sufficient one, since if the household lacks monetary resources (Type 3) or if the father's occupation limits the time available for food production (Type 1), the consumption of country foods is generally less.

The coefficients of correlation that were found (Table IV) are still relatively modest, with few differences observed in regard to the average proportion of country foods in the diet of different types of Inuit households (Table V). In the context of the present

situation, in no case are cultural, demographic or economic factors sufficient on their own to explain what is decisively influencing the choices made in each Inuit household. Moreover, other factors should also be examined, such as psychosocial factors or food preferences that were not considered in the Quebec Health Survey. In our view, a complex interrelational approach using both quantitative and qualitative methods is necessary to arrive at a comprehensive explanation of the phenomena observed.

The aim of the Quebec Health Survey on nutrition was not to understand dietary practices, but simply to describe them. Consequently, we do not have the data needed to pursue more in-depth investigations at present. Explanatory analyses would therefore be premature at this point. The results presented here do however indicate some directions for further study.

In conclusion, the aim of this study was to characterize the Inuit diet based on a quantitative description of the amounts of foods consumed. Through this approach we were able to establish a number of links between certain dietary practices and some consumer characteristics. But a population's diet cannot be reduced to the quantities of foods ingested, because it also involves a series of practices, beliefs and habits. In Inuit society, country foods, especially meats from large mammals, are still greatly appreciated, but they also hold a very significant symbolic value. Moreover, these foods currently represent an important aspect of the Inuit identity (e.g. Borré, 1991; Freeman, 1988a,b, 1996; Poirier, 1997). If country foods have a cultural, social and economic value, we must not forget that imported foods, which play a major role in the diet, also have a cultural, social and economic value. The results of our examination, however partial, of dietary practices in this article are eloquent testimony to the Inuit's participation in today's pluralistic society.

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## APPENDIX

List of foods, frequency questionnaire  
Quebec health survey among the Inuit of Nunavik, 1992 ( $n = 67$ )

Country foods ( $n = 23$ )	Industrial foods ( $n = 44$ )
Beluga (dry meat)	Bannock
Beluga (fresh, frozen, cooked meat)	Cakes, donuts and pies
Beluga (white part and fat)	Canned beans
Beluga liver	Canned beef stew
Beluga skin	Canned corn
Caribou (dry meat)	Canned fruits
Caribou (fresh, frozen, cooked meat)	Canned meat
Char (dry)	Canned salmon

APPENDIX (*continued*)

Country foods ( <i>n</i> = 23)	Industrial foods ( <i>n</i> = 44)
Char (fresh, frozen, cooked)	Canned sardines
Goose, duck (dry meat)	Canned tomatoes
Goose, duck (fresh, frozen, cooked meat)	Carrots (fresh, canned or frozen)
Hare	Cheddar cheese
Mattak	Chicken (breast, thigh, whole)
Ptarmigan	Chicken breaded, fried and frozen
Salmon (dry)	Chips
Salmon (fresh, frozen, cooked)	Cookies
Seal (dry meat)	Corned beef
Seal (fresh, frozen, cooked)	Dried mashed potatoes
Seal fat (incl. fermented)	French fries
Seal liver	Fresh fruits
Walrus	Frozen fish fingers
Whale and narwal	Frozen ground beef or croquette
Wild berries	Lard
	Macaroni and cheese
	Milk (fresh, powder, evaporated)
	Oatmeal
	Orange flavoured juice (Tang)
	Peanut butter
	Pilot cookies
	Pizza
	Pork chops
	Potatoes (fresh and cooked)
	Pure apple or orange juice
	Rice, macaroni and spaghetti
	Sliced cheese
	Smoked sliced meat
	Soft drinks
	Steak, T-bone
	Weiners
	White bread
	Whole wheat bread