# SANTÉ QUÉBEC

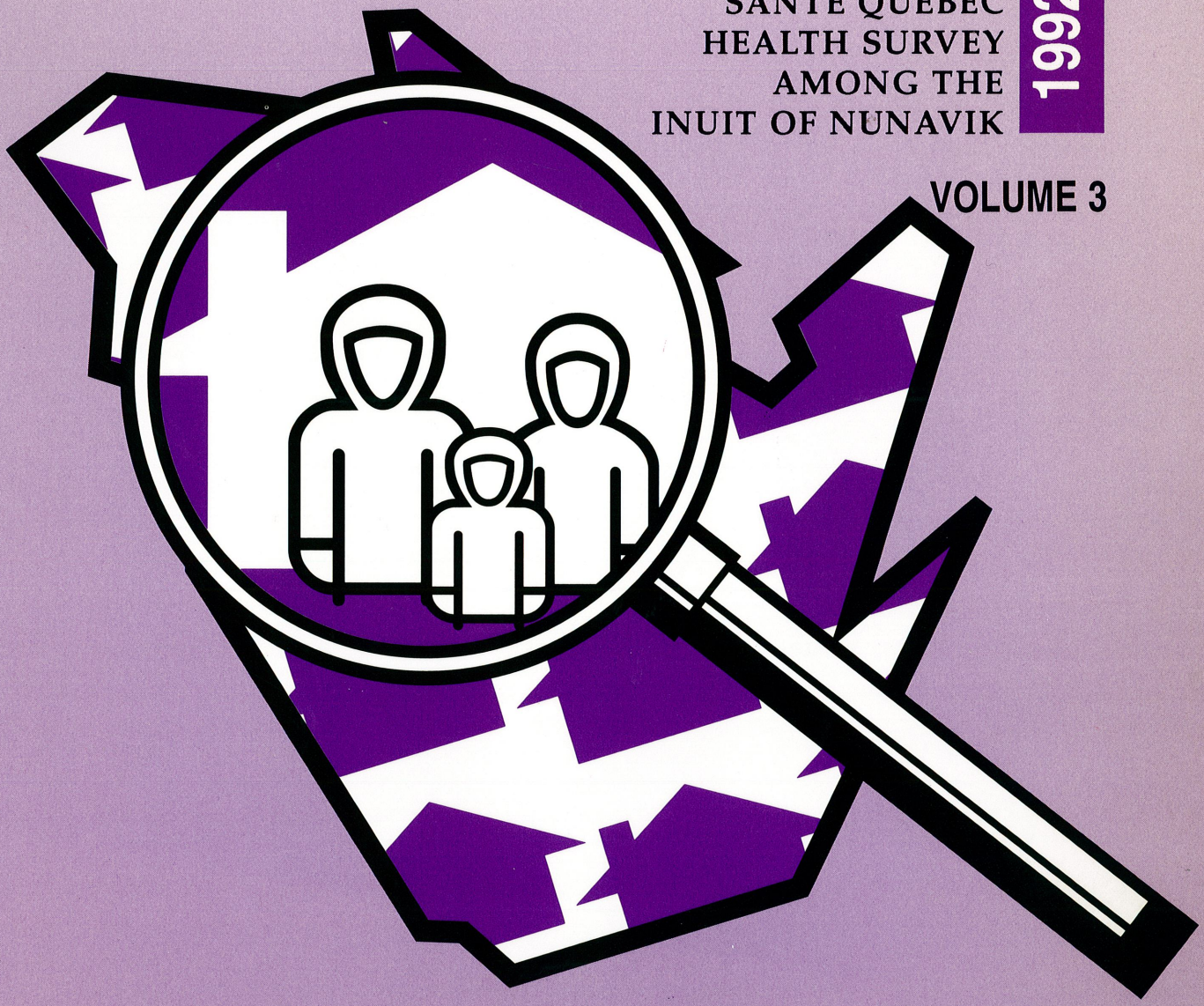
## A HEALTH PROFILE OF THE INUIT

REPORT

OF THE SANTÉ QUÉBEC HEALTH SURVEY AMONG THE INUIT OF NUNAVIK

1992

VOLUME 3



Québec

# SANTÉ QUÉBEC

## A HEALTH PROFILE OF THE INUIT

REPORT OF THE SANTÉ QUÉBEC HEALTH SURVEY
AMONG THE INUIT OF NUNAVIK, 1992

**VOLUME III**

**DIET: A HEALTH DETERMINING FACTOR**

*Editor: Mireille Jetté*

Gouvernement du Québec
**Santé Québec**

# SANTÉ QUÉBEC

# A HEALTH PROFILE OF THE INUIT

## *Report of the Santé Québec Health Survey Among the Inuit of Nunavik, 1992*

This survey conducted by Santé Québec was made possible through grants from the Ministry of Health and Social Services (Québec) *[MSSS]*, the National Health Research and Development Programme (Canada) [NHRDP] and the Kativik Regional Council of Health and Social Services [KRCHSS].

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We would also like to express our appreciation to Ms. Lise Bertrand (nutritionist, M.Ph). This pioneer in nutrition at Santé Québec forged the way. We benefit today from the substantial work accomplished by her and her team.

We are also very grateful to the invaluable contribution of a natural partner of Santé Québec, the Bureau de la statistique du Québec (BSQ, Québec bureau of statistics), headed by Mr. Robert Courtemanche and Mr. Marcel Godbout.

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Mireille Jetté
Co-ordinator

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## LIST OF SYMBOLS AND ABBREVIATIONS

| | |
|---|---|
| NWT | Northwest Territories |
| PUFA | Polyunsaturated fatty acids |
| RDI | Recommended dietary intake |
| SBESC | Santé et Bien-être social Canada (Health and Welfare Canada) |

## LIST OF CHEMICAL SYMBOLS AND UNITS OF MEASUREMENT

| | |
|---|---|
| $\mu$g | Microgram |
| NE | Niacine equivalent |
| PCB | Polychlorinated biphenyls |
| PCC | Polychlorinated camphenes |
| RE | Retinol equivalent |
| TE | Tocopherol equivalent |

# INTRODUCTION

This third and final volume of the "Report of the Santé Québec Health Survey Among the Inuit of Nunavik, 1992" permits us to carefully examine a determining factor of good health—diet. As in the Québec heart and nutrition survey [Enquête québécoise sur la santé cardiovasculaire et la nutrition (1990)],[1] one of the two major studies that inspired this survey among the Inuit, the field of nutrition has assumed a much higher profile given the interest in cardiovascular disease and the different factors associated with morbidity. The descriptions and analyses used here have substantially benefitted from the experiences involved conducting initial studies, and from work previously performed by our fellow nutritionists who helped write the report: "Enquête québécoise sur la nutrition, 1990".[2]

As Jean Trémolières did in 1978, we must also recognize that *"[...] today's leading physical illnesses are associated with disorders in dietary behaviour".*[3] Moreover, various studies conducted over the past fifteen years have confirmed certain links between nutrition and "cancers and infectious diseases."[4]

While the historical background of Volume I demonstrated that antibiotic therapy and vaccination have helped eradicate most epidemiological infections that decimated the Inuit population from the 1950s through the 1960s, chapters 3, 5, 7 and 10 of the report demonstrate just how important diet is to healthy Inuit living. From childhood, adulthood to the quite relative old age of the Inuit, *"knowing how to eat"* may serve as an effective tool for delaying the slow but what would appear inevitable advance of "diseases of western civilization" such as obesity, tooth decay, high-blood pressure, and so on.

---

(1) We have referred to the second as the "Master Survey" in Volume 1 (Santé Québec health survey, 1987).

(2) SANTÉ QUÉBEC; BERTRAND L. (sous la direction de) (1995), *Rapport de l'Enquête québécoise sur la nutrition, 1990*, Montréal, ministère de la Santé et des Services sociaux, gouvernement du Québec.

(3) TRÉMOLIÈRES, J. (1976). «Pour une médecine de savoir-vivre», dans *Critère*, «Pour un nouveau contrat médical», No 15, p.83.

(4) AXELROD, A.E. (1974). «Nutrition and acquired immunity», dans *Food and Nutrition News*, vol. 46, no 1.

BEISEL, W.R.; EDELMAN, R.; NAUSS, K.; SUSKIND, R. (1981). «Single-nutrient effects on immunology functions», *JAMA*, vol. 245, no 1.

CHANDRA, R.K. (1988). *Nutritional Regulation of Immunity in Nutrition and Immunology*, R.K. Chandra (ed.), Allan R. Liss, New York.

# GLOSSARY FOR VOLUME 3

**Bannock**

Inuit equivalent of bread. Made from flour, baking powder, salt and water. Cooked in fat.

**Blubber**

Fatty layer just beneath the skin of marine mammals.

**BMI**

Body Mass Index calculated by dividing an individual's body weight in kilograms by the square of the person's height ($m^2$).

**Heavy metals**

Cadmium, mercury and lead.

**INDIGRAS**

Composite index reflecting the consumption of fat on an individual scale.

**Level of education**

| | | |
|---|---|---|
| Primary | : | Those with no education and those who attended primary school, whether they completed it or not. |
| Secondary | : | Those who started but did not complete secondary school |
| Post-secondary | : | Those who completed secondary school. |

**Macronutrients**

Includes proteins, carbohydrates and lipids, which are nutrient energy sources.

**Methylmercury**

Toxic organic form of mercury.

**Micronutrients**

Includes vitamins and minerals.

***Misirak***

Fermented whale or seal fat.

**Nutrient intake**

Amount of energy and nutrients provided by food consumed.

**Organochlorines**

Major chemical group including organic products for industrial (PCB, BHC), agricultural (chlorinated pesticides: HCH, DDT, chlordane, toxaphene (or PCC—polychlorinated camphenes), aldrin, methoxychlore, heptachlore, mirex), and ultimately, undesirable breakdown products such as dioxins.

**Sector A**

Includes : Kuujjuarapik
Umiujaq
Inukjuak
Povungnituk
Kuujjuaq (see Volume 1, Chapter 2, Table 2.1)

**Sector B**

Includes : Akulivik
Ivujivik
Salluit
Kangiqsujuaq
Quaqtaq
Kangirsuk
Aupaluk
Tasiujaq
Kangiqsualujjuaq (see Volume 1, Chapter 2, Table 2.1)

# CHAPTER 1

# METHODOLOGICAL CONSIDERATIONS


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# 1.0 INTRODUCTION

This is the third volume of "Report of the Santé Québec Health Survey Among the Inuit of Nunavik, 1992." The reader of this work should consult Volume 1 for the key considerations guiding this survey and governing the writing of the report. Only major items pertaining to analysis of nutritional data itself appear here. For general considerations of a historical, methodological, or sociodemographic nature, please consult Volume 1. Chapter 5, titled: "Eating habits, physical activity and obesity," and other chapters concerning health determining factors are all useful for placing Volume 3 in the proper context. Readers interested in state of health and diet should refer to Volume 2 of the report.

## 1.1 SUMMARY OF THE SURVEY PROCEDURE

### 1.1.1 Designing questionnaires

"Report of the Santé Québec Health Survey Among the Inuit of Nunavik, 1992" is based on seven data-collection instruments. These instruments were derived from surveys already conducted by Santé Québec among other residents of Québec. These surveys are: the master survey "Santé Québec Health Survey, 1987," the Québec heart and nutrition survey, 1990 (Enquête québécoise sur les maladies cardiovasculaires et la nutrition, 1990), and the "Santé Québec Health Survey of the James Bay Cree, 1991." This survey, like those before it, also employed several methods:

- **face-to-face interviews,** in English and/or *Inuktitut,* between an Inuit respondent and an Inuit interviewer/interpreter.

    . The Identification Chart (instrument #1);
    . The Household Questionnaire (instrument #2);
    . The Individual Questionnaire (instrument #3).

- **self-administered questionnaires,** translated into English and into *Inuktitut,* was used for respondents who completed Confidential Questionnaires (instrument #4).

- **clinical and nutritional face-to-face interviews** in English and/or *Inuktitut* (with an interpreter), between a registered nurse and an Inuit aged 18 to 74.

    - Clinical Visit (instrument #5);
    - The 24-hour Recall (instrument #6);
    - Food Frequency Questionnaire (instrument #7).

Dietary and nutritional collection instruments were slightly modified to avoid inaccuracies that had been detected in prior use, and to adapt them to the northern way of life:

- some questions were simply eliminated;
- some questions were streamlined, to elicit more reliable answers;
- other questions were added, creating new topics and subtopics better suited to Nunavik life;
- finally, time references for certain groups of questions in the Food Frequency Questionnaire were redefined.

The two nutritional instruments used in the survey were selected and modified in close cooperation with researchers from the Nutrition Research Division (Bureau of Nutritional Sciences, Health Canada).

### 1.1.2 Pilot survey

Except for the Clinical Visit, all instruments and survey procedures were pretested at eleven *Inukjuak* households. After pilot survey results were analyzed, the latest corrections and changes were made to the instruments. No significant changes were made to the 24-hour Recall (instrument #6). The Food Frequency Questionnaire (instrument #7) was modified to better correspond to Inuit culture and the northern way of life (for example, the question on seasonal consumption frequency was in some cases replaced with one on monthly consumption frequency; food was divided into two major groups: traditional and that imported from the south; etc.).

Some data on food, more specifically pertaining to the dietary behaviour, habits and attitudes of the Inuit, was collected using the Household and Individual Questionnaires (see Chapter 5, Volume 1 of the report). "Nutritional data" came solely from the analysis of a single 24-hour Recall and the Food Frequency Questionnaire. These last two instruments were administered by nurses who had taken in-depth training beforehand.[1]

(1) For further information on the nurse training session, see *Manuel de l'enquêteur : volet nutrition* of the "Santé Québec Health Survey Among the Inuit of Nunavik, 1992," available from Santé Québec.

### 1.1.3 Interview sessions

Nurses generally made appointments during Clinical Visits (instrument #5) with respondents eligible for the 24-hour Recall (instrument #6) (Appendix 1: "24-hour Recall Appointment Card"). Accompanied by an Inuit interpreter or interviewer able to translate instructions and questions into *inuktitut* and respondent answers into English, nurses went to respondents' homes and conducted dietary interviews. Female respondents who completed 24-hour Recalls were asked to complete a Food Frequency Questionnaire if they were neither pregnant nor breast-feeding. The average length of these two interviews was estimated at about two hours.

## 1.2 SCOPE AND LIMITS OF DIETARY AND NUTRITIONAL DATA

### 1.2.1 Completion of a 24-hour Recall (instrument #6, Appendix 2)

This instrument was aimed at respondents from 18 to 74 years old for whom responses were recorded in the Household Questionnaire. The interviewer/nurse was to obtain a detailed and precise description of food products consumed in the 24 hours preceding the completion of the Recall.[1] Models of standardized portions were used to help the interpreter-nurse team better define and describe amounts of food eaten by the respondents. These 54 model portions were based on day-to-day tableware (i.e., containers of various sizes).[2]

Information gathered should have solely pertained to foods consumed just prior to the interview (a total 24 hours) and to no other day. This day began at midnight (00:01) and terminated at midnight (24:00) the day before the interview. The night worker schedule was also calculated over 24 hours. The interviewer was supposed to try to spread interviews over all seven days of the week, if possible, for respondents from a single household.

The main problems encountered during this portion of data collection were to properly define the local food consumed (few written recipes or none, for example), to measure quantities (portions) consumed with the aid of sometimes poorly adapted models, since the style of eating was somewhat different from that encountered in populations living further south. It seemed the Inuit eat essentially when they are hungry, thus less frequently as a family. This

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(1) The reader is strongly urged to refer to Chapter 1 of the report on the "Enquête québécoise sur la nutrition, 1990" for an idea of the scope and limits of data derived from data-collection instruments as such.

(2) For more information on the dietary models, consult the *Cahier Technique* of the "Enquête québécoise sur la nutrition, 1990" and the *Manuel de l'enquêteur - volet nutrition* of this study. Both are available from Santé Québec.

could make it difficult to pinpoint meal times[1] and portions consumed. Some recalls tentatively described a series of snacks rather than the more or less traditional "three meals per day with intervening snacks." The models were almost all used in more densely populated villages. In smaller and generally more remote villages, fewer models served as references and the containers used had not been planned to quantify the kinds of food they were actually measuring.[2] It should be noted that Inuit respondents often said the 24-hour Recall was interesting and easy to fill out. Furthermore, as in any survey, there may be a certain desire to please (social desirability), or there may be a resistance to the intrusion of imported food, thus tainting responses from Inuit respondents.

### 1.2.2 The Food Frequency Questionnaire (instrument #7, Appendix 3)

This questionnaire was aimed at women aged 18 to 74 who were neither pregnant nor breast-feeding and who had completed the 24-hour Recall. It measured the frequency at which they had consumed certain foods and drinks over a season, a month, or the year before the survey.[3] Although very few changes were made to the questionnaire's form, changes were made to its content to better suit it to Inuit diet and nutrition. Certain references to time, amomg others, were changed to account for such things as the "seasonal availability" of local food products. Food and drink mentioned in this questionnaire were selected based on already-established links between "food and morbidity." To provide better information on cardiovascular disease, fat was of prime concern in the questionnaire. While some foods were removed because they were unavailable or difficult to obtain, other foods were added (i.e.: local foods such as marine mammals, caribou, etc.), to present a true dietary portrait of the Inuit. Four models were used to assess the portions consumed as measured by this Questionnaire.[4]

In contrast with the Recall, this questionnaire was often perceived by Inuit respondents as being long and difficult to answer (if respondents did not understand English, it could take up to two hours to complete this instrument alone). Since interpreters were used who translated into a language the nurses did not understand, it is possible questions were not always translated consistently, as slowness of respondent response may have been one of many

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(1) For a more detailed definition of meals than that presented in Chapter 3, see Chapter 2 of the report from the "Enquête québécoise sur la nutrition, 1990."

(2) For example, it appeared the quantity of certain meats associated with traditional diet was measured using models that had been planned at the start (in the south) for measuring a quantity of noodles consumed.

(3) Chapter 1 of the report on the "Enquête québécoise sur la nutrition, 1990" is recommended for further information on the inherent scope and limits of measurement instrument data.

(4) For further details on this subject, see the *Manuel de l'enquêteur - Volet nutrition* of the Santé Québec Health Survey among the Inuit of Nunavik, 1992, available on request from Santé Québec.

factors influencing interpreters. Given these considerations, some participants may have responded to this seventh and final survey instrument hastily. Also, this would only have occurred where the number of respondents was very small (because the possibility of using any partial questionnaire had been rejected), and no survey, unfortunately, can totally protect itself against this kind of phenomenon.

Once data was collected from each village and the instruments were checked, nurses were responsible for conveying collected material to Santé Québec. After checking and correcting the instruments, Santé Québec sent them to the Nutrition Research Division (Bureau of Nutritional Sciences, Health Canada) which processed them using CANDI (*"Canadian Dietary Information System"*[1] software.[2] This program was designed for nutritional studies and contains a database with more than 11,000 descriptions of food products, vitamin and mineral supplements, and the nutritional composition of these food products. Nutritive values of foods come primarily from the "Canadian Nutrient Data File," and food databanks of the US Department of Agriculture[3].

It bears repeating that "nutrition" instruments, like other instruments used in the survey, were conserved to permit comparison of results and maintain the validity of questions. However, we believe decisions taken at each stage of the survey, along with the exceptional measures applied,[4] helped ensure results were valid. The lack of any clear incongruities in results, and their comparison with results that had been anticipated or outlined in certain specific prior studies, confirms this decision.

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(1) THOMPSON, J.N., *CANDI : Canadian Dietary Information System*, Project F311213, Nutrition Research Division, Food Directorate, Sir F.G. Banting Research Centre, Health Protection Branch, Health Canada, Ottawa, K1A OL2.

(2) Information on data control, quality, entry and processing does not appear here, because it was the same in every respect as that provided for the "Enquête québécoise sur la nutrition, 1990." These procedures were comprehensively described in Chapter 1 of that report.

(3) See Chapter 2 of the "Enquête québécoise sur la nutrition, 1990" on this subject.

(4) For example, to ensure the season to which we refer is the same for all Inuit from a given village, a calendar of events corresponding with individual lives was created to uniformly describe the beginnings and ends of each season.

## 1.3 RESPONDENTS TO THE NUTRITION PORTION OF THE SURVEY

As was previously mentioned, those respondents eligible for the "nutrition" portion of the "Report of the Santé Québec Health Survey Among the Inuit of Nunavik, 1992" were Inuit from 18 to 74 years of age for whom information appeared in the Household Questionnaire. Although this entire subsample was asked to fill out the 24-hour Recall, an even smaller subsample, consisting of 18- to 74-year-old women who were neither pregnant nor breast-feeding, was asked to complete the Food Frequency Questionnaire. After this breakdown was made, 433 Inuit completed the 24-hour Recall and 228 women answered the Food Frequency Questionnaire (Table 1.1).

Table 1.1 shows the age/sex categories of this report are different from those used in the "Enquête québécoise sur la nutrition, 1990." This was mostly due to the sparse number of individuals in the 50-64 and 65-74 age categories. The fact the Inuit sample was small, and the Inuit population is much younger, with much shorter longevity for residents of Nunavik, were among the reasons it was not possible to break the Inuit sample into age/sex groups of 35-64 and 65-74 years, as in the report from the "Enquête québécoise sur la santé cardiovasculaire, 1990." Thus, the few exploratory comparisons that will be presented subsequently have been made possible only if nutritional data for the Québec population had already been provided in groups corresponding to those used for the Inuit.

## TABLE 1.1

**Breakdown of subjects who responded to questionnaires by age, sex, coast of residence and administrative sector (N) [Inuit, 1992]**

| | 24-HOUR RECALL (INSTRUMENT #6) | FOOD FREQUENCY QUESTIONNAIRE (INSTRUMENT #7) |
|---|---|---|
| TOTAL RESPONDENTS | **433** | **228** |
| AGE/SEX | | |
| • Males | **197** | N/A* |
| 18-34 years | 92 | N/A* |
| 35-49 years | 64 | N/A* |
| 50-74 years | 41 | N/A* |
| • Females | **236** | **228** |
| 18-34 years | 103 | 99 |
| 35-49 years | 70 | 69 |
| 50-74 years | 63 | 60 |
| • Coast of residence | | |
| Hudson | 230 | 117 |
| Ungava | 203 | 111 |
| • Administrative sectors | | |
| A | 243 | 126 |
| B | 190 | 102 |

* Not applicable

### 1.3.1 Rates of participation

Table 1.2 illustrates rates of participation and of non-response by survey instrument.

If we only consider Inuit participation with instruments specifically designed for collecting dietary and nutritional data—instruments #6 and #7—it appears rates of participation were low (61% and 67% respectively). This low participation may be attributed chiefly to the impossibility of initially contacting prospective respondents. More than one third of those failing to respond to the 24-hour Recall could not be reached (category: "impossible to contact"). This proportion climbed to almost half among respondents surveyed through the Food Frequency Questionnaire. Thus the need to collect information quickly in villages (imperatives associated with costs, the difficulties and logistics of a survey in the remote North, and the high turnover rate of Inuit interviewers) had the unfortunate effect of increasing the rate of non-response because there was no way to contact individuals sampled

to invite them to participate in the survey. Further, whether this failure to participate was a function of rejection or of the impossibility of contacting persons to be interviewed does not diminish the fact that the following statistics must be interpreted cautiously, considering the relatively small size of the sample. It should be added that the "small size" of the sample is clearly relative if we compare it to samples used in other dietary surveys conducted elsewhere in Canada or abroad among northern peoples. Tables 2.1, 2.2 and 2.3 of the following chapter show that, of the dozen studies noted in the literature review, the dietary portion of the "Report of the Santé Québec Health Survey Among the Inuit of Nunavik, 1992" involved the second-largest sample.

## TABLE 1.2

**Rate of participation by instrument (%) [Inuit, 1992][1]**

| | INSTR. #1 AND #2 | INSTR. #3 | INSTR. #4 | INSTR. #5 | INSTR. #6 | INSTR. #7 |
|---|---|---|---|---|---|---|
| PARTICIPATION | 79.8 | 69.6 | 65.8 | 67.6 | 60.5 | 67.3 |
| NON-PARTICIPATION | 20.1 | 30.4 | 34.2 | 32.4 | 39.5 | 32.7 |
| • Refusal | 13.0 | 20.7 | 24.3 | 23.4 | 21.8 | 14.7 |
| • Household impossible to contact | 3.7 | N/A* | N/A* | N/A* | N/A* | N/A* |
| • Individual impossible to contact | N/A* | 7.2 | 7.2 | 6.8 | 14.2 | 13.3 |
| • Sickness/age or language | 3.4 | 1.9 | 2.1 | 2.2 | 3.4 | 3.8 |
| • File incomplete | N/A* | 1.4 | 1.0 | N/A* | 0.1 | 1.2 |

* Not applicable

| | |
|---|---|
| Instrument #1 | Identification chart |
| Instrument #2 | Household Questionnaire |
| Instrument #3 | Individual Questionnaire |
| Instrument #4 | Confidential Questionnaire |
| Instrument #5 | Clinical Visit |
| Instrument #6 | 24-hour Recall |
| Instrument #7 | Food Frequency Questionnaire |

[1] This table was taken in part from Chapter 1 (Volume 1, p. 27). It becomes easier to understand if we are only considering the rate of participation rather than the rate of response.

## 1.4 METHODOLOGICAL CONSIDERATIONS FOR ANALYSIS

Since we are primarily basing our survey on work done by researchers and authors involved in the "Enquête québécoise sur la nutrition, 1990," we shall only present the data for analysis that characterized the Inuit dietary survey. This data appears in the chapter *Méthodes d'analyse* and the *Cahier technique* of the *Enquête québécoise sur la nutrition, 1990,* in which conceptual and technical aspects of dietary and nutritional data analysis are abundantly considered.

### 1.4.1 Classifying foods

The CANDI system refers to a food-classification scheme listed in the "Canadian Nutrient Data File". It contains 50 food categories and 148 food sub-groups. For the "Report of the Santé Québec Health Survey Among the Inuit of Nunavik, 1992," only 45 of the 50 categories and 125 or the 148 sub-groups were used. Like the master survey, this initial classification let us establish two new food groups. The first is based on a division of foods into twenty dietary groups.[1] This is used in the analysis of the contribution of food products to nutrients. The second uses four groups corresponding to the four large groups of the *Canada's Food Guide to Healthy Eating*, and makes it possible to draw parallels between Inuit diet and recommendations of this food guide to the southern Canadian population. Moreover, special attention has been paid to the consumption of food products appearing in *Canada's Food Guide to Healthy Eating* which have been called "fat and/or sweet..."[2] by the researchers and writers of the reference survey. Table 1.3 compares these two classification schemes.

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(1) The "Report of the Santé Québec Health Survey Among the Inuit of Nunavik, 1992," uses a division of twenty food groups, rather than sixteen like the reference study, because of such factors as traditional food in the Inuit diet.

(2) For a justification of the use of the labels "fat" and/or "sweet" used for certain food products, refer to the chapter titled *Méthodes d'analyse* of "Enquête québécoise sur la nutrition, 1990."

# TABLE 1.3

## Classification Table - CANDI software basic food products [Inuit, 1992]

| 20 FOOD GROUPS | • GROUP[1]<br>SUB-GROUP[1] | LIST OF BASIC FOOD PRODUCTS AND INGREDIENTS FOR RECIPES* |
|---|---|---|
| Group 01<br>Breads, cereals, noodles, rice | • CP<br>– → | → 1A, 1B, 1C, 2A, 3A, 3B, 4A (except bannock) 5A, 6A. |
| Group 02<br>Potato chips & crackers, pretzels, popcorn | • FV<br>fat | **Potato chips**<br>→ 38A. |
| | • –<br>– → | **Crackers, popcorn, pretzels**<br>→ 4B, 42A. |
| | • –<br>fat → | **Ex. Tortillas, chips**<br>→ 42B. |
| Group 03<br>Pastries | • CP<br>fat →<br>sugar →<br>fat + sugar → | <br>→ 4D.<br>→ 4F.<br>→ 7A, 8A, 8B. |
| Group 04<br>Bannock | • CP<br>fat → | <br>→ 4A. |
| Group 05<br>Milk, yogurt, pudding | • DP<br>– → | <br>→ 10A, 10B, 10D, 10E, 10H, 10I, 15B. |
| Group 06<br>Cream, ice cream | • DP<br>fat+sugar →<br>fat → | <br>→ 9A.<br>→ 13A, 13B, 13C, 13D. |
| Group 07<br>Cheese | • DP<br>– →<br>fat → | <br>→ 14A, 14B, 14C.<br>→ 14D. |

[1] As defined in *Canada's Food Guide to Healthy Eating*.

* To identify the specific foods identified by the alphanumeric codes in the third column, refer to Appendix 4, *"List of base foods - Santé Québec Inuit Survey"*.

**...table continues on the following page...**

| 20 FOOD GROUPS | • GROUP[1]<br>SUB-GROUP[1] | LIST OF BASIC FOOD PRODUCTS AND INGREDIENTS FOR RECIPES* |
|---|---|---|
| Group 08<br>Meat, fowl | • MS | |
| | – → | → 22A, 25A, 25D, 27A, 27C, 28A, 29A. |
| | fat → | → 22B, 22C, 25B, 25E, 27B, 27D, 27F, 28B, 30A, 32A. |
| Group 09<br>Game, wildfowl | • MS | |
| | – → | → 31A, 27E. |
| Group 10<br>Fish | • MS | |
| | – → | → 34A, 34B, 35A. |
| Group 11<br>Eggs | • MS | |
| | – → | → 16A. |
| Group 12<br>Legumes, nuts, grains | • MS | |
| | – → | → 37A, 37B. |
| | fat → | → 33A, 33C. |
| Group 13<br>Vegetables | • FV | |
| | – → | → 36A, 36B, 36C, 36D, 36E, 36F, 36G, 36H, 36I, 36J, 36K, 36L, 36N, 36O, 36P, 39A, 50A. |
| | fat → | → 38B. |
| Group 14<br>Fruits and fruit juices | • FV | |
| | – → | → 40A, 40B, 40C, 40E, 40F, 40G 40H, 40I, 40J, 40K, 40L, 45A. |
| Group 15<br>Butter, margarine, fat and oil | • – | |
| | fat → | → 17A, 18A, 18B, 20A, 21A, 21C, 50E. |
| Group 16<br>Fat from animals and game | • – | |
| | fat → | → 21B. |
| Group 17<br>Tea, coffee, soft drinks and fruit-flavoured drinks | • – | |
| | – → | → 51A, 51B. |
| | sugar → | → 46A, 46B, 46C, 46D. |

[1] As defined in *Canada's Food Guide to Healthy Eating*.

* To identify the specific foods identified by the alphanumeric codes in the third column, refer to Appendix 4, *"List of base foods - Santé Québec Inuit Survey"*.

**... table continues on the following page ...**

| 20 FOOD GROUPS | • GROUP[1]<br>SUB-GROUP[1] | LIST OF BASIC FOOD PRODUCTS AND INGREDIENTS FOR RECIPES* |
|---|---|---|
| Group 18<br>Alcoholic beverages | • –<br>alcohol | → 47A, 47B, 48A, 49A. |
| Group 19<br>Sugar, sweets and chocolate | • –<br>sugar → | → 41A, 41B, 41C, 43A, 43B, 43C, 44A. |
| Group 20<br>Miscellaneous | • –<br>– →<br>fat → | → 41D, 50B, 50D, 50F, 51C, 53A, 53B, 50G.<br>→ 50C. |

[1] As defined in *Canada's Food Guide to Healthy Eating*.

* To identify the specific foods identified by the alphanumeric codes in the third column, refer to Appendix 4, *"List of base foods - Santé Québec Inuit Survey"*.

**CAPTION:**

- **CP:** Foods included in "Cereal products"*
- **FV:** Foods included in "Fruits and vegetables"*
- **DP:** Foods included in "Dairy Products"*
- **MS:** Foods included in "Meat and meat substitutes"*
- –: Foods belonging to none of the 4 groups*

Fat → : "fat" foods
Sugar → : "sweet" foods
Fat + sugar →: "fat and sweet" foods
– →: foods not classified as "fat" or "sweet"

* *Canada's Food Guide to Healthy Eating*.

With respect to the contribution of foods to nutrients (the 32 nutrients appear in Table 1.4), not only is the quantity of nutrients large, but the identification of "source food products" for the nutrients is also. With regard to our comments on the contributions of certain nutrients, consider the possibility that the decreased popularity of a particular food, could, for example, result in a decrease of certain nutritive components of the diet of one population, while renewed popularity of this food product could equally enhance the contribution of the targeted nutrient. Moreover, familiarity with basic food products in the Inuit diet could permit modifications to the ingredients used in preparing food to increase the intake of certain micro- and macronutrients (as will be suggested for bannock).

**TABLE 1.4**

**List of 32 nutrients (units of measurement) studied in the "Santé Québec Health Survey Among the Inuit of Nunavik, 1992" [Inuit, 1992]**

| MACRO- AND MICRONUTRIENTS | |
|---|---|
| PROTEINS (g) | VITAMIN A (RE) |
| LIPIDS (g) | CAROTENE (RE) |
| SATURATED FATTY ACIDS (g) | TOTAL VITAMIN D (µg) |
| MONO-UNSATURATED FATTY ACIDS (g) | NATURAL VITAMIN D (µg) |
| POLYUNSATURATED FATTY ACIDS (g) | ADDED VITAMIN D (µg) |
| LINOLEIC ACID (g) n-6 | VITAMIN E (µg TE) |
| LINOLENIC ACID (g) n-3 | VITAMIN C (mg) |
| CHOLESTEROL (mg) | THIAMIN (mg) |
| CARBOHYDRATES (g) | RIBOFLAVIN (mg) |
| DIETARY FIBRE (g) | NIACIN (mg or EN) |
| | VITAMIN $B_6$ (mg) |
| CALCIUM (mg) | FOLIC ACID (µg) |
| MAGNESIUM mg) | VITAMIN $B_{12}$ (µg) |
| PHOSPHORUS (mg) | PANTOTHENIC ACID (mg) |
| POTASSIUM (mg) | |
| IRON (mg) | CAFFEINE (mg) |
| ZINC (mg) | |
| SODIUM (mg) | |

## 1.4.2 Presentation and comparison of results

As was done in the reference survey ("Enquête québécoise sur la nutrition, 1990"), data and results to be presented in the following chapter will be subjects of exploratory comparisons. Like the data in the first two volumes, dietary results have been weighted and are thus representative for the Inuit population as whole.

Data is first organized along orientations defined in *Canada's Food Guide to Healthy Eating*. The latter is the best-known nutritional educational resource among people working in this field, among researchers or among the general public. Whenever parallels are drawn between the data of the "Report of the Santé Québec Health Survey Among the Inuit of Nunavik, 1992," and *Canada's Food Guide to Healthy Eating* or other studies dealing with Inuit nutrition (e.g.: Nutrition Canada Survey of 1971 (SBESC, 1975; 1976); Kuhnlein and Soueida, 1992; Moffat *et al.*, 1991; etc.), it must be borne in mind that such avenues open the way to analyses going beyond the initial descriptions presented here.

Only after applying the appropriate statistical tests and performing standardization operations and various statistical manipulations can the exploratory hypotheses underlying this report be declared meaningful or not, in statistical and nutritional terms. As the prime goal of this survey was to describe as exhaustively as possible the key elements affecting the health status of the Nunavik Inuit population as well as some of the principal determining factors and consequences, and since nutrition is only one of the health determining factors (representing one of more than forty issues), we had to reduce the number of statistical operations and analyses to focus on presenting the first descriptive analyses.

The abnormal and occasionally asymmetric distribution of certain nutritional variables enormously complicates the task of generating relevant statistical tests on constant variables such as means or medians. Furthermore, the lack of more than one 24-hour Recall or a retest of 30% of the completed recalls[1] hampered control over the variability between individuals that marks measurement of results from a single recall. Since no measurement of the scale of specifications associated with the statistics was produced, the results presented should be used with caution, and only very large differences observed between two results may be considered genuine. Along the same lines, results discussed in Chapter 3 will essentially be medians, considering that this final parameter, located in the centre of the curve, is less affected by the extreme values that characterize certain dietary variables. Basic statistics provided in the reports of other Inuit dietary studies are occasionally presented to establish means, for the sole purpose of comparing these results with those of other surveys cited, solely for purposes of information.

## 1.5 CONCLUSIONS

Because of constant evolution in nutritional and statistical sciences, the challenge of this portion of the survey was to collect cross-sectional data providing information for the Inuit population, are useful to people in the field and to planners, are significant to researchers, and are as valid as possible. This survey is essentially a cornerstone in a portrait of Inuit nutrition that is as reliable and valid as it is fundamental. As is the case of the "Report of the Santé Québec Health Survey among the Inuit of Nunavik, 1992," the wealth of data collected in the reference surveys reflects the difficulties they encountered and about which they yield so much information. These are the efforts that have been deployed throughout the survey process, dealing with problems and limits, and particularly seeking solutions applicable over the medium or long term which will incorporate enhancements from epidemiological, social and hygiene studies. In closing, the first value of an initial survey is that it exists, that it generates integrated data that would otherwise remain unknown, poorly or known

(1) As with other nutritional surveys by Santé Québec, recall controls were used with only 10% of completed dietary recalls.

fragmentary, and to document these original data as accurately as possible while presenting their merits as well as their limitations. In so doing, this study follows in the footsteps of surveys that cannot but benefit as a result.

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# CHAPTER 2

# LITERATURE REVIEW


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## 2.0 INTRODUCTION

Authors of studies on Inuit eating habits have noted major changes in recent years. The most striking is their growing consumption of foods "imported from the South." The economic, social and environmental reasons behind this popularity of imported foods at the expense of traditional foods are described further on.

Provided they were available, local food resources used to meet the nutritional needs of the Inuit (Draper, 1978). Certain practices, such as using the viscera of animals and traditional methods of preparing and preserving food, afforded a more varied diet than is commonly assumed (Wein, 1986). The Inuit were able to cover their vitamin C needs by eating berries and vegetables in summer, and particularly through year-round consumption of raw, frozen or slightly warmed meat *(ibid.)*. These methods of preparation made it possible to preserve the limited quantity of vitamin C contained in meat. Consumption of the fat and organs of fish and marine mammals contributed significant amounts of vitamins A and D (Draper, 1978). Because their diet contained no dairy products, sources of calcium were very limited. Eating the spongy part of marine and land mammal bones, a widespread practice, particularly among pregnant and nursing women, provided this nutrient (Schaefer and Steckle, 1980). Iron and several other nutrients were supplied by a high consumption of meat. On the whole, the Inuit diet was rich in proteins and lipids but very low in carbohydrates. Carbohydrates provided 2 to 10% of the energy intake among the Inuit, compared with 40-50% among the rest of the North American population (Draper, 1978). Seasonal vegetables and glycogen from the liver and muscles of animals were the main sources of carbohydrates (Wein, 1986).

The recent availability and accessibility of imported foods changed the eating habits of the Inuit. It took only one or two generations for the transition from traditional to "southern" foods to be complete (Wein, 1986). Thus, the Inuit went from a diet rich in proteins, polyunsaturated fatty acids (particularly n-3), vitamins and minerals to a diet higher in saturated fatty acids, refined carbohydrates and sodium, and lower in certain essential nutrients. Junk foods like chocolate bars, pastry, sugar, soft drinks and fruit beverages now make up an important part of Inuit intake of carbohydrates as a source of energy, particularly among the younger people. Consumption of these foods is often at the expense of traditional foods, thus increasing the risks of nutritional deficiencies (Wein, 1986). The greatest risk is insufficient intake of vitamins A, C, D and folic acid, and calcium and iron (particularly among women). In addition, tooth decay -- which was virtually inexistent in the past -- is now widespread and makes it difficult to chew bones and raw or frozen meat (Schaefer and Steckle, 1980). Finally, this change in eating habits is not unrelated to the appreciable increase in so-called "Western civilization" diseases like obesity, kidney stones, high blood pressure, cardiovascular ailments and diabetes mellitus (Schaefer, 1994), but these are not the subject of this report.

A number of factors may explain the increased presence of imported foods in the Inuit diet at the expense of traditional foods. In the past, the Inuit were spread out throughout the Northern territory, but with the emergence of regional centres came larger agglomerations of people exerting pressure on the territory's land and marine mammal resources (Kuhnlein, 1990). In some regions, quotas are imposed on certain animal species (Wein and Freeman, 1992). On the other hand, many families do not have sufficient income to buy and maintain the kind of hunting and fishing equipment that would give them access to regions where territorial resources are more abundant (Bell, 1990). For one thing, more and more people have a job, which considerably reduces the time available for hunting and fishing; for another, the income generated by these jobs enables them to buy imported and, often, prepared foods (Kuhnlein, 1990). Of late, the Inuit have become more fearful of consuming traditional foods due to the electronic media's warning about the danger of land and marine mammals being contaminated by pollutants. The demand for and availability of imported foods have increased in recent years, and it is now socially acceptable to eat "white man's food." All these factors have in some way contributed to reducing the transfer of knowledge about traditional foods. The young are less convinced than their elders of the health benefits of traditional foods (Wein, Sabry and Evers, 1989).

## 2.1 FACTORS INFLUENCING INUIT EATING HABITS

Eating habits are influenced by personal factors like age, income, education level and food preferences, and by outside factors like a society's level of modernization or acculturation, and its geographic location and climate.

### 2.1.1 Personal factors

#### 2.1.1.1 Age

A number of authors have reported positive correlation between an individual's age and traditional foods, i.e. older people are more likely to eat foods like marine mammals (including the viscera) and seasonal plants than younger people (Wein and Freeman, 1992; Kinloch, Kuhnlein and Muir, 1992; Moffatt *et al.*, 1991). Moffatt *et al.* (1991) noted that meat is as popular among younger people as among their elders, but the former are more likely to buy it from a store. Verdier and Eaton (1987) reported that milk, juice and fruit beverages were consumed primarily by children in one of the Northwest Territories communities. In an anthropological study of an Inuit community north of Baffin Island, Borré (1991) reported certain comments made during interviews to the effect that Inuit who grow up eating traditional foods must continue to do so regularly to survive. This would explain why the older people in this community eat traditional foods on a regular basis and seldom use imported foods. A young Inuk in good health can consume imported foods without any

problem, but in case of illness, eating traditional foods, particularly seal, seems to be the best remedy.

#### 2.1.1.2 Education

The higher the **education level,** the more negative the attitude toward traditional foods (Wein and Freeman, 1992). This may be linked to the fact that the more educated individuals generally have a higher income and can thus afford to buy imported foods. To our knowledge, few in-depth studies have been conducted on this subject.

#### 2.1.1.3 Income

Among the studies dealing with the Inuit diet, none has investigated the link between food consumption and income. This is probably due to the fact that people generally dislike being questioned about their income. Also, income is often difficult to estimate in a society where few people are gainfully employed; the Inuit themselves do not know their own income, as reported by Santé Québec, given the multiple sources of revenue (Choinière and Chevalier, 1994). In one of the Labrador communities, a significantly larger quantity of local foods (marine and land mammals, fish, plants) was harvested over a one-year period by financially comfortable households than by poorer ones (Mackey and Orr, 1987). Other researchers, including Wein and Freeman (1992), questioned the Inuit on their main occupation, but they did not establish a link with their food consumption. The presence of a hunter or trapper in a household was viewed as a rough indicator of accessibility to traditional foods.

Some of the information we do have about income, however, leads us to conclude that it is insufficient by far. A survey report on various Northern communities that receive food products by airplane reveals that job opportunities in these communities are rare and that the income level per capita is well below the national average (Ministre des Approvisionnements et Services Canada, 1990). According to the 1986 census, Native income per capita was around $4,000 in Northern Québec Inuit communities, and closer to $6,000 in Kuujjuarapik and Kuujjuaq, the two largest regional centres. The report also reveals that families without access to local food resources and with low income are at greater risk of developing nutritional deficiencies because they depend on imported foods, which are generally more expensive and less varied. In Northern Québec, the price of perishable foodstuffs is nearly double what it is in Ottawa (*ibid.*). A more recent report shows that subsidies for air transportation of perishables (fruits, vegetables, dairy products) have driven down the prices, but the impact of these subsidies on Inuit food consumption will be disclosed in a future report (Lawn, 1993).[1]

(1) The final Lawn and Langner report (1994) was not available at the time of writing this review.

The concept of sharing is still very much alive in some communities (Freeman, 1988; Sabo III and Sabo, 1985). Many of the well-off households share their food with those who seem to be in need, particularly in periods of shortages (Ministre des Approvisionnements et Services Canada, 1990). It is therefore misleading to assume that a poor household eats only what it buys or that a household whose income is higher provides only for its own needs (*ibid.*). Community freezers, when not empty, also enable people in need to get food (Delisle *et al.*, 1994). Moreover, the vast majority of households now have their own refrigerator, and thus access to a greater variety of perishable imported foods. According to the findings of a preliminary survey conducted in Northern Québec, 84% of Inuits own or share a refrigerator (Foggin, 1984).

#### 2.1.1.4 Food preferences

A child's food preferences are greatly influenced by its family and cultural environment. Wein and Freeman (1992) noted that, in general, children like traditional foods as much as adults. However, young people showed a preference for commercial foods, which probably reflects their greater availability in recent years. On the other hand, certain species of animals like polar bear, grouse and pike are not considered fit for human consumption, except in periods of shortages (Wein and Freeman, 1992). Caribou meat was mentioned in several studies as the preferred meat by far (Wein and Freeman, 1992; Moffatt *et al.*, 1991), although some others preferred seal (Borré, 1991). The favourite food is often a staple of the Inuit diet, i.e. the food eaten every day. However, Wein and Freeman (1992) noted that preferred foods are not necessarily those consumed most often, since some products are not always available. For example, duck, certain fish and wild fruits are very well liked by the Inuit of Aklavik (N.W.T.), but they are available only at certain times of the year. Thus, the availability of local foods, which varies depending on the region and season, is a major factor in the eating habits of the Inuit, as illustrated in the following section.

### 2.1.2 Outside factors

#### 2.1.2.1 Availability

The availability of animal and plant food species depends on the geographical area and the climate. Coastal inhabitants have greater access to marine mammals than tundra dwellers, who depend mainly on caribou and small game and have easy access to seasonal plants. Even the particular area on the coast is a factor. Wein and Freeman (1992) reported that, for the Inuit of Aklavik, seal rarely travel that far up the Mackenzie River and are therefore more difficult to obtain. Caribou, which travel in herds, are easier to hunt than moose, which are solitary animals.

Seasons are definitely a major influence on the availability of local food resources, and this is probably even truer for northern inhabitants. Winters make hunting conditions very difficult. Summer (June and July) and fall (mainly September) are the best periods for hunting game and marine mammals, while spring is particularly propitious for small game, birds and fish (Freeman, Wein and Keith, 1992). Consumption is therefore closely tied to the foods available in a given season. Wein and Freeman (1992) observed that the Aklavik Inuit's consumption pattern did not entirely match seasonal variations since certain techniques used to preserve food (freezing, drying, smoking) made it possible to extend their availability. Caribou, beluga and fish were available year round thanks to preservation techniques. Birds were eaten primarily in the fall and the spring, wild fruits, roots and leafy plants in the summer and early fall. The food consumption of one Native population (not exclusively Inuit) in Alaska also varied widely depending on the seasons (Nobmann *et al.*, 1992). Energy intakes, proteins and lipids among men and women were significantly lower in spring than any other season. Intakes of iron, in women only, were also lower in spring. On the other hand, the migratory habits of some species may also fluctuate from year to year and therefore influence consumption. For example, a food survey conducted in a Baffin Island community showed that beluga was consumed in greater quantities in the summer of 1988 than in the previous year (Kuhnlein and Soueida, 1992).

These studies clearly show the importance of geography and climate in assessing Inuit eating habits. It is possible that some foods were not eaten simply because they were not available in the region at the time of the survey, not because they were not known or appreciated by the people. The availability of imported foods is also influenced by seasonal variations since, in certain regions, shipments of food come only once or twice a year (Nowak, 1975). As well, some stores have very little storage space, which limits the variety and quantity of the foods available (*ibid.*).

#### 2.1.2.2 Level of acculturation and modernization

It goes without saying that Inuit eating habits have changed due to increasing contact with industrialized countries. The inhabitants of regions served by an airport or maritime port are more exposed to commercial products from large cities than inhabitants in remote regions. Nowak (1975) conducted a survey on the use of prepared meals in a small Alaska village. The population was divided into three groups, from the most traditional to the most modern according to the degree of association with present-day American culture (speech, dress, job, etc.). Prepared meals were used more widely by so-called modern and generally younger families, who had been more exposed to this type of food than older families. The author considers that the use of prepared meals reflects the Inuit's economic situation because it tells us something about their buying power. Despite the use of prepared meals, hunting and fishing are still popular with young people, but their value is more recreational.

## 2.2 STUDIES ON FOOD CONSUMPTION AND NUTRITIONAL INTAKES AMONG THE INUIT

All methods used to survey food consumption have their limitations. A 24-hour Recall is the method most often used to quantify the food intake of an individual or household (Willett, 1990). The method is simple and rapid, but a single 24-hour Recall is rarely representative of an individual's customary intake. However, it gives a fairly representative idea of a population's average intake, provided the number of subjects interviewed is sufficiently high. Several 24-hour Recalls at different times of the year provide a clearer estimate of customary intakes, particularly if the seasonal variations are significant. The Frequency Questionnaire is used to measure long-term intakes, thus providing a more representative idea of customary intakes, or to estimate the consumption of specific foods (Willett, 1990). The food weighing method is also used in food surveys. This is the most accurate of all applicable methods but is relatively more demanding, more costly and requires good cooperation from the respondents. For these reasons, it is generally used with small samples (Gibson, 1990a). In less developed regions, a household's food intake is most often estimated by means of a 24-hour Recall or by weighing portions, since these methods do not require the people surveyed to have a high level of education and the information is collected by the investigators themselves. However, if the mother tongue of the population under study is different from that used to prepare the questionnaire, it is imperative that the interviewers be bilingual.

The main difficulty encountered in food surveys is trying to identify the size of portions as accurately as possible. To do this, the interviewees have to be able to visualize measurement units clearly and transpose them to their own eating habits (Willett, 1990). In many cases, they seem to have difficulty describing the size of their portions accurately (Guthrie, 1984). This exercise may be even more awkward for people from a different culture, who are not familiar with the concept of portion. In this case, the use of household measurement units can reduce the risk of error but these units should be calibrated (Gibson, 1990b). The use of food models provides a more accurate estimate of the quantities consumed (Willett, 1990), but these models should probably be adapted to the cultural context. In Frequency Questionnaires, however, it appears unjustified to estimate the size of portions in standard units, as this adds little to the evaluation of food intakes since the size of portions varies less from one individual to another than the frequency of consumption (Willett, 1990).

In the literature on food consumption among the Inuit, the 24-hour Recall has been used as often as the Frequency Questionnaire since the early 1980s to estimate food intakes. In several cases, the Frequency Questionnaire was used to measure the consumption of specific foods, such as marine and land mammals. Only one study, conducted among the Inuit of Greenland (Bang, 1980), used the food weighing method, but it is not discussed here, as this review focuses on studies conducted at later dates.

### 2.2.1 Studies using the Food Frequency Questionnaire

Those studies that used the Food Frequency Questionnaire to measure customary intakes are for the most part Canadian. They are first presented separately, each having a specific methodology, and are followed by a discussion of the work as a whole. Table 2.1, at the end of this chapter, sums up the data arising from these studies.

The Freeman team (Wein and Freeman, 1992; Freeman, Wein and Keith, 1992) interviewed 36 heads of households on the use of *traditional* foods in the home for each season during the previous year (1990-91). The interviews were conducted by two Inuit women from the region, previously trained by one of the two researchers. Six choices of answer on the frequency of consumption were offered: number of times per day, per week or per month, but other choices of answers could also be given. A food-preference questionnaire (traditional and imported foods) was also administered to heads of households and 35 school-aged children. The results showed that 89% of households included at least one hunter/trapper (at least part time) and that caribou and beluga were the most frequently used foods, followed by fish, birds and fruits. Seal is not readily available in the region. Roots and leafy plants were rarely eaten, and then mostly by older people. The consumption pattern does not precisely coincide with harvests and hunting and fishing seasons because some foods are processed for later consumption. In winter, the meat is frozen, whereas it is dried or smoked in other seasons. Age had a positive correlation with traditional foods while the level of education had a negative correlation. Food preferences among adults and children were similar, although imported foods were more popular among children than adults. Some foods said to be preferred showed little correlation with their consumption (muskrat, whitefish, ling, cranberries and blueberries) but no reason was given.

Moffatt, Neil and Young (1991) selected 1,135 individuals at random, weighting for sex and age (four age groups for each sex: 1-17, 18-34, 35-54, 55+) to answer an individual questionnaire on the health condition of the Keewatin (N.W.T.) population. The rate of response was 77% (875 individuals). A Food Frequency Questionnaire was administered in *Inuktitut* by previously trained local research assistants to adolescents (age not specified) and adults (aged 18 and over) (484 individuals) on the use of *traditional* and *imported* foods during the previous month. This is the only study using the Frequency Questionnaire which focused both on traditional and imported foods. The choices of answer proposed were: never, number of times per month (up to 3 times a month), per week (4 times or more per month up to 6 times a week) or per day (one or more times a day). Three communities were surveyed in the spring and five in the fall of 1990.

The results showed that meat is consumed on a daily basis by the majority of Inuit, but that the source differs depending on the age group: among younger people, meat was often store-bought, whereas older people made use of the hunting or fishing products found on the

territory. The same was true for fish. Nearly three quarters of the Inuit used a frying pan and lard or butter to cook foods "occasionally." As well, 72% consumed fermented meat (a method that presents some risk of botulism and trichinosis). Marine mammals were consumed less frequently and were less popular among younger individuals. Bread or cereal products were important staples, with 75% of adults eating them daily. Fifty percent of younger Inuit reported consuming dairy products every day, compared with 30% of older individuals (see discussion, Section 3.1.1). Forty percent of adolescents ate potato chips or chocolate bars daily. However, ignorance was often a factor when it came to eating foods with little nutritional value. For example, 35% and 60% of adults respectively were unaware that fruit drinks and "Jello" contained sugar, 77% were unaware that cheese was high in sodium, and 80% did not know that eggs were high in cholesterol (Moffatt *et al.*, 1993). Caribou heads the list of foods considered more healthy, followed by seafood and vegetables. In communities where higher quantities of fish and marine mammals were caught for food in 1987, blood levels of eicosapentanoic acid among adults were also higher.

Kuhnlein and Soueida's study (1992) was conducted in an Inuit community in Baffin Island. Among studies that used the Food Frequency Questionnaire, this is the most rigorous since the questionnaire was administered at intervals of two months over a twelve-month period. The sample was stratified according to frequency of use of local food resources, as perceived by community workers. Local bilingual investigators, supervised by a research agent, interviewed 69 women between the ages of 20 and 40 on the use of *traditional* foods in the household. A total of 365 questionnaires were completed. The results were compiled so as to obtain an estimate of annual food consumption using a weighted average score for the number of households for each food. On an annual basis, the most popular and most frequently consumed traditional foods were ringed seal, caribou, Arctic char, followed by narwhal, molluscs and walrus. Bearded seal and various species of birds were less popular. Among plants, kelp, blackberries and blueberries were the most popular. The authors also measured the nutritional content of traditional foods. Because of their frequent consumption, marine and land mammals were a good source of energy (proteins and lipids), retinol, iron, zinc, copper, magnesium and manganese. In contrast to the usual findings in such regions, calcium was present in relatively high quantities, the best sources being the stomach of the caribou and its contents (probably because of plant sources), the skin of the char, the whole sculpin (including the bones), duck, clams, kelp and other tundra plants. Several nutrients (even certain trace elements) were reported in this study but, surprisingly, no mention is made of vitamins C and D and folic acid, especially since these nutrients are often lacking in the Inuit diet.

The studies conducted by Gerrard (Gerrard *et al.*, 1990; Popeski *et al.*, 1991) were designed specifically to establish a link between the consumption of fish and land and marine mammals in pregnant women and their blood pressure. The types of fatty acids in their diet could significantly affect the development of high blood pressure during pregnancy, particularly

*eicosapentanoic acid*, which has anti-thrombotic properties. Three hundred women in seven communities where the harvest of fish and land mammals during the year was either high or low, were monitored for blood pressure, but only 27 pregnant women, chosen at random, answered a questionnaire on the frequency of consumption of fish, seal, walrus, beef and caribou during the month preceding delivery and for the previous year. The results revealed that in communities with a greater availability of marine mammals, the frequency of consumption reported by the women interviewed was indeed higher than among women in communities where such foods were less readily available. Moreover, in communities with a higher consumption of seafood, women had a lower diastolic pressure during the six hours preceding delivery and the incidence of high blood pressure was also lower than in communities where consumption of marine products was less frequent, independently of the respondent's weight before pregnancy and para status (number of previous offspring). The authors are cautious in the interpretation of results and estimate that the relation between the consumption of marine products and blood pressure can be associated with other factors, like salt intake, which were not measured.

In one of the Arctic Bay (N.W.T.) Inuit communities, Verdier and Eaton (1987a) found that the blood levels of vitamin A were low, so they investigated the use of food sources of vitamins A and C among 53 families (Verdier and Eaton, 1987b). The period covered by the Frequency Questionnaire is not mentioned. The questionnaire is semi-quantitative and the equivalent-adult concept[1] was used to weight individual intakes per household. Seventy-four percent of households reported eating traditional foods. There was at least one hunter per household. Despite the availability of local food resources in this community, the main sources of vitamin A came from imported foods, including milk, butter, margarine, enriched lard and eggs. Milk was consumed primarily by children, but the quantities were not large enough to cover their needs. It is estimated that households with low consumption of marine mammals and liver (16% did not eat liver) are at risk of vitamin A deficiency. The authors (Verdier *et al.*, 1987b) reported a lower incidence of vitamin C deficiency in subjects of this study than in the Inuit in the Nutrition Canada survey of 1971 (SBESC, 1976). This probably reflects the increase in the consumption of fruit juices and fruit drinks (especially the latter), to which vitamin C has been added in recent years. Canned juices are consumed primarily by children. Apart from that, consumption of fruits and vegetables is very low. Canned vegetables were preferred by far (93% of households ate them). Fresh fruits were eaten only two to five times a month by 80% of households.

(1) Unit used to compare households of the same size but having different demographic makeups. The attributed value depends on age and sex, and the reference value (= 1) generally applies to men between the ages of 18 and 30.

#### 2.2.1.1 Discussion of studies using the Frequency Questionnaire

In all studies, the representativity of the sample is a crucial factor in the interpretation of the results. The work of Moffatt *et al.* (1991) and Gerrard *et al.* (1990) focused on a relatively high number of individuals in several Keewatin communities; their results can therefore be applied to the entire Keewatin region. However, although 300 women were monitored in the Gerrard *et al.* study (1990), only 27 women in seven different communities answered the Frequency Questionnaire. Despite the weak response, it is interesting to note that communities with a greater availability of marine products (based on harvest) were indeed those in which women had reported a higher frequency of consumption (*ibid.*). The other surveys mentioned above dealt with a particular community. In one of the studies, all households were selected because the community was relatively small (Verdier and Eaton, 1987); in other studies, individuals (households) were selected at random or weighted on the basis of certain criteria. For example, despite the small number of households selected (n = 36), the sample was representative of the Inuit population in Aklavik, since the households selected at random represented 42% of all Inuit households (Wein and Freeman, 1992).

Apart from the work of Moffatt *et al.* (1991), the studies cited above did not estimate the consumption frequency of imported foods in the communities under study, as they concentrated essentially on the use of traditional foods. In regions where food consumption is influenced by seasonal variations, as is the case in Northern regions, the Frequency Questionnaire should at least cover the different seasons. Also, to facilitate recall and reduce the risk of error, interviews held in each season are preferable to a single interview encompassing several seasons. Only Kuhnlein and Soueida (1992) conducted interviews every two months for a year. Wein and Freeman (1992) and Gerrard *et al.* (1990) tried to account for the effect of the seasons, but they did so by way of a single interview dealing with the previous year's consumption. In all fairness, however, it is probably very difficult for an Inuk to answer these types of questions since the notion of frequency and time as used to conduct interviews is a very "southern" concept. As well, the use of terms like "occasionally," "regularly" or "very often" to qualify the frequency of consumption (e.g. Gerrard *et al.* study, 1990) is somewhat alien to the Inuit. As for the studies by Moffatt *et al.* (1991) and Verdier and Eaton (1987), the frequency of consumption was evaluated only for the month prior to the interview and the conclusions therefore apply only to that period.

All the studies, with the exception of that of Verdier and Eaton (1987), used a qualitative questionnaire and therefore hold no information on the quantity of foods consumed. For some foods, it may be relevant to estimate the quantity consumed regularly so as to avoid any ambiguity. For example, Moffatt *et al.* (1991) reported that 50% of young people and 30% of older individuals consumed dairy products. Were they referring to the milk contained in

coffee, cereals or taken as a beverage? The distinction is important because milk is rich in calcium, a nutrient often lacking in the Inuit diet.

To sum up, the studies that used the Food Frequency Questionnaire were all conducted in Canada, in the Northwest Territories. The majority of them dealt with the use of local food resources. They reveal that traditional foods are still very much part of the Inuit diet and that caribou, seal, beluga and Arctic char are eaten more frequently than other species. The consumption of vegetables is low and imported foods are the main sources of vitamins A and C. Consumption frequency is influenced by the age of the individuals, the area of residence and the season.

## 2.2.2 Studies using the 24-hour Recall

The 24-hour Recall was used in studies to estimate Inuit food consumption in various circumpolar areas, including Baffin Island, Chukotka (Siberia), Alaska and Northern Sweden. A summary of the methodology is presented in Table 2.2, at the end of this chapter.

The Kuhnlein team used both the Frequency Questionnaire and the 24-hour Recall to estimate Inuit food consumption in one of the Baffin communities (Kinloch, Kuhnlein and Muir, 1992; Kuhnlein, Kubow and Soueida, 1991; Kuhnlein, 1990). The 24-hour Recall was used six times, at two-month intervals. All individuals in the community were covered but the participation rate was 60-70%. Men and women between the ages of 20 and 40 derived about twice as much energy from imported foods as from traditional foods (Kuhnlein, Kubow and Soueida, 1991); the main contributors were sugar, powdered milk added to coffee, fruit-flavoured drinks, soft drinks, bleached flower in ***bannock***, cookies and white bread (Kinloch, Kuhnlein and Muir, 1992). These foods were reported as staples in most families. The authors consider that such imported foods cannot meet the nutritional needs of the population. Even with the contribution of traditional foods, women between the ages of 20 and 40 seldom met their vitamin A and calcium needs; cheese and *bannock* were the only regular sources of calcium (Kuhnlein, 1990). However, the need for iron was largely met, mainly because of a high and regular intake of seal meat (Kinloch *et al.*, 1992). Zinc intake was also high, the main sources being narwhal (particularly the skin) and caribou. The consumption of traditional foods was highest in September and lowest in January. Average quantities of meat eaten daily by women varied between 125 g and 635 g depending on the type of meat.

Haglin (1990) compared the nutritional intakes of Saami and Swedish individuals, using the 24-hour Recall administered on three different days. The selection method was not specified. Meals were later categorized as main meal or snack, depending on the time they were taken and the items comprising the meal. On average, the Saami had higher intakes of proteins, cholesterol, niacin, vitamin $B_{12}$, iron, zinc and selenium than the Swedes. This difference can probably be attributed to a higher consumption of meat among the Saami, although the author makes no reference to foods that could explain the differences in **nutritional intake** between the two populations. Compared with the Swedish recommendations, the Saami diet was inadequate in calcium, folic acid and dietary fibre. Intake among Saami women was significantly lower than among men for lipids and selenium, but higher for carbohydrates, calcium, carotene, vitamin C, folic acid and dietary fibre.

Nikitin *et al.* (1991) compared the diet of coastal residents with that of tundra dwellers in the Chukotka region of Siberia. All men between the ages of 30 and 59 were approached, and a single 24-hour Recall per individual was administered. Coastal residents had a significantly higher energy intake (especially proteins and lipids) than tundra dwellers; they ate less refined sugar, marine mammals being their main source of protein, as opposed to caribou and fish in the tundra. As a result, coastal residents had a higher intake of polyunsaturated fatty acids and a lower intake of saturated fatty acids. These results show that geographical location makes a significant difference in the availability of food. This study was compared with the one conducted by Nobmann *et al.* (1992) in a Native community of Alaska. It would have been inappropriate to compare the results of these two studies statistically since there is a vast difference in their methodologies (e.g., the same nutritional value was used for several foods in the Chukotka study, whereas a specific value was ascribed to each food in the other). However, it appears that protein intake was higher in Chukotka than in Alaska, while the higher carbohydrate intake reported in Alaska was probably linked to a higher consumption of imported foods in that region.

The Nobmann *et al.* study (1992) was conducted in eleven Alaskan Native communities (53% Inuit, 34% Indian, 13% Aleut). To capture seasonal variations, five recalls were done in each season (18 months), including twice in summer. The food consumption frequency was calculated by listing the total number of times a food was reported in each season, in order of importance. This may explain why very few traditional foods were on the list of most-often eaten foods, as their consumption varies with the seasons, unlike imported foods.

The authors compared the food intakes of Native peoples with those of non-native North Americans, based on national survey findings (NHANES II and CSFII). Both groups reported consuming coffee, tea, sugar, white bread and margarine with the same frequency but in different quantities. Natives consumed twice as much coffee (four cups a day on average) and twice as much table sugar as the general population. Consumption of white rice, fruit-flavoured drinks (Tang and Kool-Aid), soft drinks and milk were also frequently reported

among Natives. Also among Natives, consumption of fish was six times higher. Lipids provided 38% of energy; 11% of which came from fish and 10% from *agutuk*, also called Inuit ice cream, which is usually made with hydrogenated vegetable shortening. *Agutuk* (for those who reported eating it), beef and butter were the main sources of saturated fatty acids. Despite low consumption of fruits and vegetables (average of two servings a day), intakes of vitamin A and C were fairly high, with orange drinks providing 35% of vitamin C. In fact, average nutritional and energy intakes were significantly higher among Natives, except for calcium. At least half of the Native population met or exceeded the recommended dietary intakes (RDI) for most nutrients. However, calcium intake was insufficient for more than half of the interviewees and a quarter of the women met less than 70% of their needs in iron. Natives reported consuming fewer alcoholic beverages than the general population, although it is possible that intakes were underestimated because the survey days did not coincide with episodes of "binge drinking," a frequent problem among Native populations.

#### 2.2.2.1 Discussion of studies using the 24-hour Recall

To obtain a representative estimate of a population's average intakes, the consumption survey must be repeated each season. Two studies met this criterion: that of Kuhnlein *et al.* (1991) and Nobmann *et al.* (1992), who conducted six two-month recalls and five seasonal recalls respectively over a period of 18 months with a considerable number of individuals. The Nikitin *et al.* study (1991) in Chukotka spanned two years, and seasonal variations were not taken into account. In addition, the recall was preceded by a 12-hour period of fasting; the Inuit may have increased their food intakes somewhat, knowing that they had to fast for 12 hours.

The majority of the studies mention that the cultural context was taken into account and the instruments adapted accordingly. However, no study makes any mention of the difficulty of using measurement instruments developed in a North American context. How were the standard measurement units applied in communities where local measurement units were used? How did the Inuit differentiate between a meal and a snack? How were these terms defined? The Nutrition Canada survey (SBESC, 1976) estimates that the way of life of the Inuit does not lend itself to the 24-hour Recall method. Moreover, the interview methods may have caused shyness and embarrassment in individuals unfamiliar with this type of interview, thus affecting the quality of the information collected (Cassidy, 1994).

In most of the studies cited, the surveys took place in a single community; the results therefore apply to that community only. The Moffatt study covered many communities, but the selected households are nonetheless representative only of households appearing on the Alaska Native health services lists. The sample represents mainly sedentary households, the authors having noted that a large proportion of the selected households could not be contacted (69% in one community) because they had left the community and could not be traced.

Two studies (Nobmann *et al.*, 1992; Haglin, 1990) compared the nutritional intakes of Inuit communities with those of the southern population. Although it is tempting to draw such a comparison, caution is required. For example, Nobmann *et al.* (1992) compared the Alaskan Native population with that covered by the National American Survey (NHANES II). It was planned in such a way as to avoid Northern regions in winter, which may have influenced the average readings regarding food consumption and nutritional intakes for the American population as a whole. For example, the American population seems to consume more fruits and vegetables (due to the fact that some regions are not surveyed in winter) than the Native population. On the other hand, the study among Natives included the summer season twice, thus overestimating to some extent the consumption of fish. Further, several studies report that calcium intakes are for the most part insufficient when compared with the recommended intakes. It seems, however, that the Inuit have developed a highly efficient mechanism to absorb calcium, which would explain why their needs are lower than the general population's, in which consumption of dairy products is considerable. In short, hasty conclusions should be avoided when comparing the results obtained from two populations that are basically different.

In summary, a number of studies using the 24-hour Recall were held in various Northern regions. Some conducted the recall only once while others used several recalls to capture seasonal variations. Generally speaking, imported foods were consumed more frequently than traditional foods, despite their low nutritional value. Quantities of marine and terrestrial mammal meat consumed can be considerable at certain times. Calcium intakes were low in most cases, while iron and zinc intakes were adequate when caribou and marine mammals were the main sources of meat. Imported foods were the main source of vitamins A and C, but not always in sufficient quantities.

## 2.3 RISKS AND BENEFITS OF TRADITIONAL INUIT FOODS

Studies on nutrition among the Inuit often report high contents of proteins and total lipids, but the focus is usually on low content of saturated fatty acids (7-9% of total energy among the Inuit of Greenland) and high content of polyunsaturated fatty acids, notably the n-3 type. The ratio of polyunsaturated to saturated fatty acids is therefore much higher among the Inuit: 0.84 against 0.24 among Danes (Bang *et al.*, 1980). The presence of n-3 fatty acids in food would explain, among other things, the lower rate of cardiovascular problems and diabetes mellitus among the Inuit than in Western populations (*ibid.*). Food surveys reveal that the intake of n-3 acids is 14 g/day among the Inuit, compared with 3 g/day among the Danes and 0.2 g/day among Americans (Feskens and Kromhout, 1993). A more recent study (Hansen

*et al*, 1994) suggests that a combination of n-3 acids, monounsaturated fatty acids and antioxidants (selenium) in the traditional Inuit diet explains the lower incidence of cardiovascular problems in this population. Studies have revealed that marine mammal ***blubber*** and polar bear fat are the richest sources of polyunsaturated fatty acids (particularly n-3) in traditional foods (Kuhnlein *et al.*, 1991; Innis and Kuhnlein, 1987).

Some studies delved into the issue of contamination of local food resources by environmental contaminants and the risks associated with the consumption of these foods (Kinloch *et al.*, 1992; Kuhnlein and Kinloch, 1988). Higher levels of polychlorinated biphenyls (PCBs) were detected in the breast milk of Northern Québec Inuit women than in non-Native Québec women (Dewailly *et al.*, 1989). What can be done about this situation? Should Natives change some of their eating habits? This point will be discussed further on in this chapter.

Kinloch *et al.* (1992) assessed the risks and benefits associated with the consumption of traditional foods in a Baffin Island community. Based on analyses of traditional food samples, it was found that narwhal *blubber* (subcutaneous fat), skin and meat were responsible for more than 40% of the total contaminant intake, except for PCCs, at different times in the surveys. Seal contributed more than 20% of the total pollutant intake, not counting PCCs. Because organochlorines are stored in fatty tissues, the richer in adipose tissue the animal the greater the concentration. About 12% and 17% of individuals respectively exceeded the tolerable daily dose for ingestion of PCBs and PCCs.

These contaminated foods are nonetheless an important source of energy, proteins, lipids (including mono- and polyunsaturated fatty acids), iron, zinc, copper, retinol and other essential elements. The consequences of ingesting the current quantities of contaminants and the long-term effects cannot be confirmed at present. However, limiting the consumption of traditional foods would risk causing major nutritional deficiencies, particularly during pregnancy and nursing, since, as we saw earlier, these foods continue to provide several nutrients. The use of imported foods could be viewed as an alternative, but their variety, freshness and nutritional quality are generally limited and their cost is often high. Making imported foods more affordable would result in higher consumption of nutritional foods, but it would also encourage consumption of foods with little nutritional value (Lawn *et al.*, 1993).

To sum up, the benefits of consuming local food resources and encouraging breastfeeding, and the risks associated with a sudden transition to imported foods (as currently available) outweigh the negative consequences of ingesting contaminants associated with a traditional diet (Kinloch, Kuhnlein and Muir, 1992).

## 2.4 STUDIES THAT CAN BE COMPARED WITH THE SANTÉ QUÉBEC HEALTH SURVEY

For all practical purposes, the studies reviewed in this report can be compared with the Santé Québec health survey among the Inuit of Nunavik, with the exception of the studies conducted by Gerrard *et al.* (1990) and Verdier and Eaton (1987). Whereas Verdier and Eaton (1987) studied only the frequency of consumption of some sources of vitamins A and C, the Gerrard study was specifically designed to establish a link between consumption of marine mammals among *pregnant* women and their blood pressure. Table 2.3, at the end of this chapter, sums up studies that can be compared with the Santé Québec survey, and shows the criteria used for comparison. The lower rate of response in the Santé Québec health survey will be the subject of future analyses. However, the "rate of response"[1] may not be as significant in all studies. The rate of response is generally lower than the collaboration rate, which, among other things, does not take into account individuals that could not be traced. In comparing the studies among them, the analyses of results presented above should be kept in mind. Moreover, there are many differences between studies on the sampling method, the size and composition of the samples, the survey period and the instruments used. Nonetheless, the study that comes closest to the Santé Québec survey in terms of methodology and the territory covered is that conducted by Moffatt (Moffatt *et al.*, 1991) in the Keewatin (N.W.T) region. Like the Santé Québec health survey, the Moffatt study took into account the frequency of consumption of both traditional and imported foods, with the difference that the Keewatin interview dealt with the month preceding the survey whereas the Santé Québec survey covered every season of the year preceding the survey. Although the Santé Québec survey gives a more representative estimate of intakes, it is also a source of error, as mentioned earlier. On the other hand, the Keewatin study findings are purely descriptive, and no statistical test was applied.

At the time of writing this review, the Kuhnlein *et al.* study (1991; 1992) was the only one which, like the Santé Québec survey, had used the 24-hour Recall *and* the Frequency Questionnaire. The fact that Kuhnlein used these instruments every two months for a year definitely provides a more accurate estimate of average food intakes in the community under study, but the results apply to one community only. The Santé Québec survey was designed to encompass the 14 Nunavik communities and is thus representative of the entire territory.

(1) The rate of response refers to the number of survey instruments (questionnaires) completed and returned, divided by the total number of individuals who would have been surveyed if everyone had participated. (Last, 1988).

Among the researchers who used measuring instruments to estimate the food consumption of the Inuit, Nikitin *et al.* (1991) seem to be the only ones, apart from the Santé Québec team, to have used food models. However, no mention is made of the way these instruments were perceived by the Inuit.

Although the studies presented here provide considerable information, a few points deserve to be further analyzed. For instance, a profile of the families or individuals most likely to use imported foods or traditional foods, or who are more at risk of nutritional deficiencies, would be useful. The influence of the level of education of the Inuit on their eating habits, for example, was not highlighted, and the relation between family income or the occupation of the head of the household and food consumption was barely touched upon. In addition, the results reported in the studies often deal with intakes in calcium, iron, vitamins A, C, D and folic acid because they are often insufficient in the Inuit diet. In addition to the usual nutrients, particular attention should be paid to the calcium:phosphorus ratio (not just calcium on its own), and to dietary fibre. Also, even though the needs in selenium are not clearly established, selenium intake should be investigated because of its potential role in preventing heart disease and its antagonist effect on mercury toxicity.

## 2.5 CONCLUSIONS

In light of the studies presented in this review of the literature over the past fifteen years, it is clear that the Inuit diet has changed considerably in the past decades, due to, among other things, the greater availability of imported foods. Nevertheless, local food resources continue to play a major role in the Inuit diet. This role should be encouraged, despite the spectre of contamination by pollutants, because the advantages of traditional foods outweigh the drawbacks.

That said, it is undeniable that imported foods will be increasingly available in the years ahead and it would be out of place to stand in the way of this development. Although some of the imported foods are often low in nutritional value, others have contributed to increasing the nutritional quality of the Inuit diet. For example, fresh fruits and vegetables supply an appreciable quantity of vitamin C, folic acid, carotene and several trace elements. Cheese is also an important source of calcium, which is often found in insufficient quantities in a meat-eating diet, unless the bones of fish and the spongy part of bones from game animals are consumed. Bread and whole-grain cereals, when consumed, also supply an appreciable quantity of nutrients. Because ignorance is one of the main reasons less nutritional foods are selected, people should be educated about the value of imported foods, so they can choose those that are most beneficial to their health.

## TABLE 2.1

### Summary of methodology in studies that used the Food Frequency Questionnaire

| AUTHORS | LOCATION | SAMPLING R = REPRESENTATIVE NR = NON-REPRESENTATIVE | SURVEY PERIOD | FOODS STUDIED |
|---|---|---|---|---|
| Wein and Freeman (1992) | Northwest Terr. Aklavik community | Random (Inuit household list); n=36 heads of households (42% of all households); R of one community | Every season of the year 1990-91 | Traditional foods |
| Kuhnlein and Soueida (1992) | Northwest Terr. Broughton Island community | Weighted for consumption frequency of traditional foods, n= 69 women aged 20-40 years Participation rate= 60-70% (Total N = 430); R of one community | 6 questionnaires at two-month intervals from 1987-88 | Traditional foods |
| Moffatt *et al.*(1991) | Northwest Terr. 8 Keewatin communities | Random, 20% of census population (1,135 individuals) Response rate = 77% FQ : 484 adolescents (age not specified) and adults (18 years +) R of Keewatin territory | Frequency over 1 month, spring : 3 comm. autumn : 5 comm. | Total food consumption |
| Gerrard *et al.* (1991) | Northwest Terr. 7 Keewatin communities | Random, n = 300 women who had given birth at the Churchill, Man. clinic between 1984-87; Cons. frequency on 27 women (age not specified); R of women who had given birth at the clinic | Frequency over the month preceding birth and previous year | Marine and land mammals, fish |
| Verdier *et al.* (1987) | Northwest Terr. Arctic Bay community | All community households Participation rate = 80% n = 53 heads of households R of one community | March-April 1980 | Frequency of 9 food sources of vitamins A and C |

## TABLE 2.2

### Summary of methodology in studies using the 24-hour Recall

| AUTHORS | LOCATION | SAMPLING | SURVEY PERIOD | MEASURING INSTRUMENTS USED |
|---|---|---|---|---|
| Kuhnlein (1990)<br>Kuhnlein *et al.* (1991) | Broughton Island community, Baffin Island | All inhabitants (aged 0-85 years) of the community (N = 430), 60-70% participation at any given time;<br>R of one community | 1987-1988 (12 months)<br>6 recalls at two-month intervals | Not specified |
| Haglin (1990) | Villages (3) of Northern Sweden (West Bothnia) | n = 48 Saami (Lapps), 23 men and 25 women<br>and 51 Swedes<br>Selection method not specified;<br>Representative? | August 87- Jan. 88<br>3 recalls/person (different days) | • Drawings of foods consumed<br>• Weighing of certain foods |
| Nikitin *et al.* (1991) | Chukotka tundra and coastal villages (Siberia) | All ♂ aged 30-59 years<br>Participation rate = 80% n = 277 ♂ (Inuit and Chukchi)<br>R of men in the villages | 1982-1984<br>1 recall/person preceded by 12-hour fast | • Food models<br>• Standard household measurements |
| Nobmann *et al.* (1992) | 11 Alaska communities (ethnic and socioeconomic differences) | Systematic selection of 873 adults (health services lists).<br>Refusal : 3-17%<br>351 Native men and women (53% Inuit)<br>R of people registered on the health services list (11 communities) | 1987-88 (5 seasons)<br>1 recall/season (995 recalls) | • Standard household measurements + scales |

## TABLE 2.3

### Comparison criteria between the different studies

| STUDIES | SAMPLE | SURVEY PERIOD | 24-HOUR RECALL | FREQUENCY QUESTIONNAIRE |
|---|---|---|---|---|
| Santé Québec (Nunavik) | Random<br>Weighted (age, sex, sector)<br>Collaboration rate = 61%<br>433 ♂ and ♀ aged 18-74 years<br>14 localities | Sept-Dec. 92 | 1 recall/person<br>(n = 433) | Previous year<br>(each season)<br>228 ♀ not pregnant or nursing<br>Traditional and imported foods |
| Keewatin Health Assessment Study Moffatt *et al.* (1991) | Random<br>Weighted (age, sex, sector)<br>Response rate = 77%<br>484 adolescents and adults<br>8 communities | Spring 90<br>*or*<br>Sept-Dec. 90 | | Preceding month<br>Traditional and imported foods |
| Alaska Natives Nobmann *et al.* (1992) | Systematic,<br>Refusal = 3-17%<br>351 ♂ and ♀ aged 21-60 years<br>(53% Inuit)<br>11 communities | 1987-88<br>(5 seasons) | 1 recall/person/season<br>(995 recalls) | |
| Chukotka (Siberia) Nikitin *et al.* (1991) | All men aged 30-59 years<br>Participation rate = 80%<br>n = 277 ♂ Chukchi and Inuit<br>Coastal and tundra villages | 1982-1984 | 1 recall/person | |
| Broughton Island (Baffin Island) Kuhnlein *et al.* (1991; 1992) | All inhabitants of one community<br>Participation rate = 60-70%<br>n = 250-300 pers. 0-65+ years | 1987-1988 | 6 recalls<br>2-mth interv./person | 2-mth interv. (6)<br>69 ♀ aged 20-40 years<br>(365 questionnaires)<br>Traditional foods |
| Aklavik (N.W.T) Wein and Freeman (1992) | Random<br>Response rate = 90%<br>n = 36 heads of households<br>(♂ or ♀, 25-69 years)<br>1 community | Autumn 1991 | | Previous year<br>(each season)<br>Traditional foods |
| Bothnia (Northern Sweden) Haglin (1990) | Not specified<br>n = 48 Saami (Lapps)<br>♂ and ♀<br>3 villages | August 87 - Jan. 88 | 3 recalls/person<br>(different days) | |

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# CHAPTER 3

# FOOD CONSUMPTION AND NUTRITIONAL INTAKES


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## 3.0 INTRODUCTION

This chapter deals with two concurrent objectives: (1) to describe the quality of the Inuit population's diet based on the guidelines suggested in *Canada's Food Guide to Healthy Eating*; and (2) to describe the nutritional value of their diet and identify the potential problems of such a diet for the Inuit population as a whole or certain of its subgroups.

The first section focuses on the consumption of foods belonging to the four groups identified in Canada's Food Guide and on sugars and fats. It also contains an analysis of the intake breakdown for the day of the survey and of certain practices associated with the ingestion of various food groups.

The second section deals with energy and nutritional intakes estimated on the basis of the 24-hour Recall and is used to establish a parallel, albeit tentative, with the survey data for the Québec population (SQN, 1990). It also contains an analysis of the contribution made by food groups and subgroups (total of 20) to the nutritional intakes of the Inuit. This analysis is restricted primarily to nutrients that were found of particular interest when the literature was reviewed. Wherever possible, a brief comparison is made with the results of the survey conducted by Nutrition Canada among the Inuit of Canada in 1971 (SBESC, 1975; 1976), as a way to identify changes in nutrition that may have occurred in Northern communities over the past twenty years. Traditional foods are highlighted in an attempt to determine the importance of such foods in the Inuit diet, in order to guide any future intervention aimed at reducing risks of exposure to contaminants.

This chapter is meant to be descriptive and presents only an overall analysis of the data collected. Nonetheless, some sociodemographic factors were taken into consideration to interpret the findings, notably age, sex, education,[1] coastal region (Hudson and Ungava) and administrative **sectors (A and B).**

Readers are reminded that this survey is based on a one-day recall, plus a questionnaire on the frequency of consumption of imported foods during the month preceding the survey (conducted in the fall of 1992) and traditional foods during different seasons in the previous year. Combining the 24-hour Recall and the Food Frequency Questionnaire makes it possible to obtain a better picture of customary intakes. However, as in similar studies, the conclusions can be applied only to groups of individuals (which can be broken down into subgroups by age and other factors) and not to individuals. These data therefore do not permit identifying the number of individuals at risk of nutritional deficiencies.

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(1) Throughout this chapter, the results of cross-tabulations with the education variable must be used with caution since the level of education is unknown for 17% of these cases and few individuals completed high school (35) [12% did not respond to the individual questionnaire, which included a question on education; 4% gave no answer or refused to answer; and less than 1% said they did not know].

## 3.1 EVALUATION OF INUIT FOOD CONSUMPTION BY FOOD GROUP

This section describes Inuit food consumption in terms of the estimated number of servings consumed the day before the survey, based on the 24-hour Recall. For the vast majority of foods, the serving sizes used are those described in *Canada's Food Guide to Healthy Eating*. Using these pre-defined units of measurement simplifies comparisons within the Inuit community as well as with the findings of other food surveys. However, for certain foods, it appeared necessary to redefine the size of servings on the basis of their nutritional contribution. (See Chapter 2 «Méthode d'analyse» in «Rapport de l'Enquête québécoise sur la nutrition, 1990»)

### 3.1.1 Cereal products

The mean number of servings of cereal products eaten on the day before the survey by the population studied (6.3 servings) slightly exceeded the minimum number of servings suggested in *Canada's Food Guide to Healthy Eating* (5 servings). On average, men appeared to have consumed more of these products than women (7.5 servings vs. 5.9 servings).

Although the average consumption of cereal products among the Inuit population studied tended to exceed the minimum number of servings recommended in *Canada's Food Guide to Healthy Eating*, 6% of individuals had consumed no food from this group (bread, pasta, cereals or bannock) the day before the survey. This 6% comprised mainly women aged 18 to 34 and men aged 35 or more (Table 3.1). More than half of the women had eaten fewer than five servings, whereas most of the men had eaten more than five. The day before the survey, a higher proportion of men than women, most notably men between the ages 50 and 74, had eaten more than ten servings of cereal products.

## TABLE 3.1

**Breakdown of individuals by age group and sex, according to the number of servings of cereal products consumed the day before the survey (%) [Inuit, 1992]**

| | MEN | | | WOMEN | | | TOTAL |
|---|---|---|---|---|---|---|---|
| AGE | 18-34 | 35-49 | 50-74 | 18-34 | 35-49 | 50-74 | |
| N | 92 | 64 | 41 | 103 | 70 | 63 | 433 |
| NUMBER OF SERVINGS | | | | | | | |
| 0 | 4.5 | 8.8 | 7.8 | 9.2 | 5.8 | 0 | 6.4 |
| 0 TO < 5 | 43.5 | 36.5 | 25.3 | 51.2 | 40.2 | 56.9 | 43.9 |
| 5 TO < 10 | 35.8 | 35.9 | 32.2 | 31.5 | 40.4 | 21.4 | 33.7 |
| ≥ 10 | 16.3 | 18.8 | 33.7 | 8.2 | 13.4 | 21.4 | 16.0 |

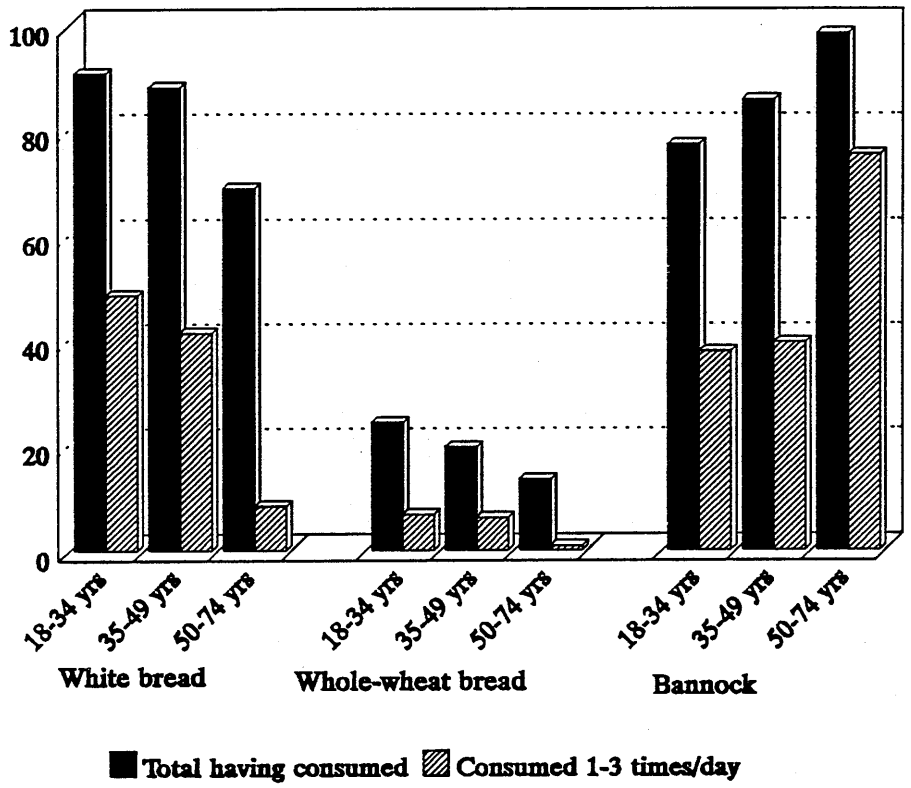
### 3.1.1.1 Consumption of bread and whole-grain cereals

Consumption of bread and whole-grain cereals appears far from widespread among the Inuit population: 93% of individuals reported no consumption of whole-grain products (24-hour Recall). On average, the Inuit had consumed 0.2 servings of bread and whole-grain cereals, with a higher consumption among women aged 50 to 74 (0.6 servings) than among women of other age groups and men of all ages. In contrast, men in the same age group reported zero consumption of bread or whole-grain cereals. Lawn and Langner (1994) also reported very low consumption of whole-grain products among Inuit communities in the Northwest Territories (N.W.T.).

These findings are supported by the answers found in the Frequency Questionnaire: 86% of women reported having eaten white bread during the month preceding the survey, while 21% had eaten whole-wheat bread. The popularity of white and whole-wheat bread tended to diminish with age, while the opposite was true for bannock (traditional Inuit bread), as shown in Graph 3.1. For example, nearly half the women in the 18-34 age group had eaten white bread between one and three times a day, against only 8% of women over the age of 50. The latter showed a clear preference for bannock, three quarters of them having eaten this food between one and three times a day, compared with one third of the younger women. On the other hand, whole-wheat bread tended to be more popular among inhabitants of the Hudson coast (26% had eaten some) than among those along the Ungava coast (14%).

## GRAPH 3.1

**Percentage of women having eaten different types of bread during the month preceding the survey [Inuit, 1992]**

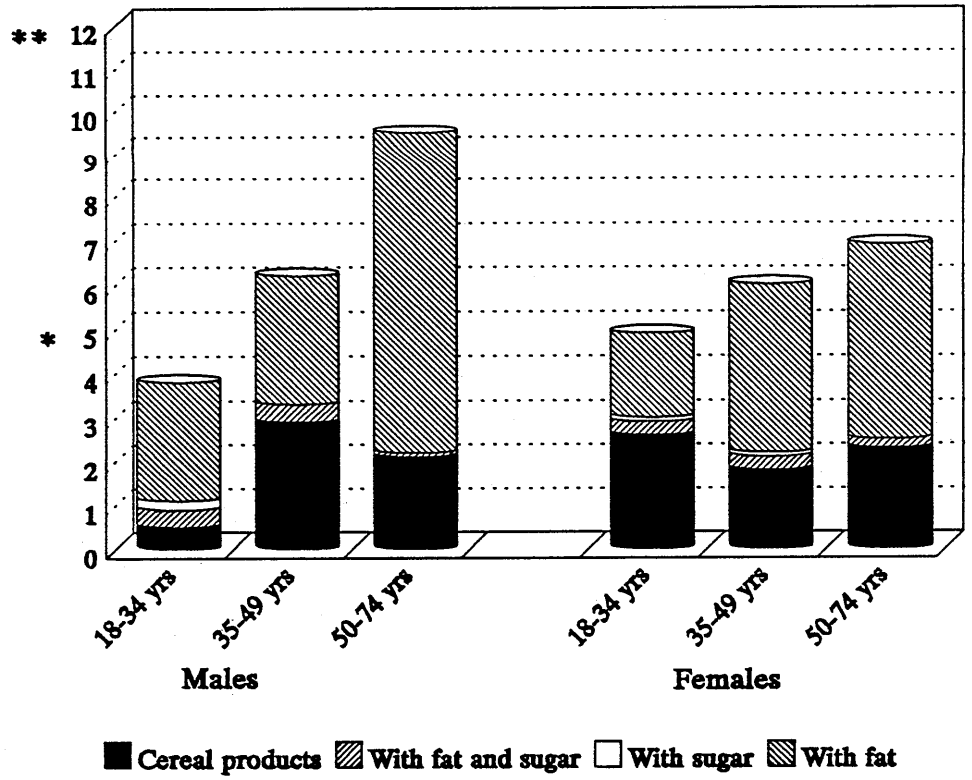



### 3.1.1.2 Consumption of cereal products containing fat and/or sugar

The majority (56%) of cereal products consumed the day before the survey were high in fat (i.e. contained 5 grams of fat more than a low-fat reference food in the same group) (Graph 3.2). On average, the Inuit had eaten 3.5 servings of cereal products high in fat during the day covered by the study. The high consumption of cereal products containing a significant amount of fat is probably attributable to the consumption of bannock among the Inuit. Bannock, which contains an appreciable amount of fat (see section 3.6.1), accounted for nearly half (46%) of the total intake (in grams) of cereal products. However, the proportion of Inuit having eaten cereal products high in sugar (i.e. containing 5 grams of sugar more than a reference food from the same group) was negligible.

## GRAPH 3.2

**Consumption of cereal products the day before the survey (mean number of servings) [Inuit, 1992]**




* Minimum number of servings *(Canada's Food Guide to Healthy Eating)*

** Maximum number of servings *(Canada's Food Guide to Healthy Eating)*

### 3.1.1.3 Breakdown of intake at meals and snacks[1]

The consumption of cereal products was distributed evenly among meals and snacks (1.7 servings for breakfast and dinner, respectively; 1.5 servings for supper; and 1.4 servings for snacks).

(1) Morning meal or snack: 05:00 - 10:59; Noon meal or snack: 11:00 - 16:59; Evening meal or snack: 17:00 - 22:59; Night meal or snack: 23:00 - 04:59.

#### 3.1.1.4 Specific foods

The contribution of bannock to energy and nutrition intakes is unequivocal. This traditional bread is made of flour, baking powder, salt and water, and cooked in fat. As will be seen later, the findings of this survey suggest that bannock plays a major nutritional role in the Inuit diet, particularly among individuals over the age of 50 (both men and women). According to the answers found in the Frequency Questionnaire, the proportion of women having consumed bannock during the month preceding the survey was the same on both coasts (Ungava and Hudson). However, compared to women in sector A, a larger proportion of women in sector B reported having eaten bannock (90% vs. 78%).

Nearly one quarter of the Inuit had eaten pasta or rice the day before the survey; only men aged 50 to 74 reported lower consumption. Eating pasta and rice appears quite frequent among Inuit; over three quarters (82%) of women reported having eaten these foods during the month preceding the survey and, according to the Frequency Questionnaire, over half ate them one to three times a week. Macaroni and cheese (*Kraft Dinner* type) was favoured by 65% of Inuit women, and nearly half (49%) ate it one to three times a week. Similarly, in a study conducted in Inuit communities in the N.W.T., women reported having eaten this type of macaroni twice a week (Lawn and Langner, 1994). Moreover, the consumption of pasta/rice was more frequent among individuals with more education than among those with less education (38% vs. 21%) and on the Ungava coast (31%) than on the Hudson coast (19%).

The findings of the 24-hour Recall suggest that the Inuit are not fond of cakes and cookies; the vast majority of individuals (93% and 95% respectively) had not consumed these foods the day before the survey. However, the answers found in the Frequency Questionnaire show that about two thirds of Inuit had eaten pastries (63%) and cookies (67%) in the month preceding the survey. Cookies (but not pastries) appear to be particularly popular among women aged 18 to 34.

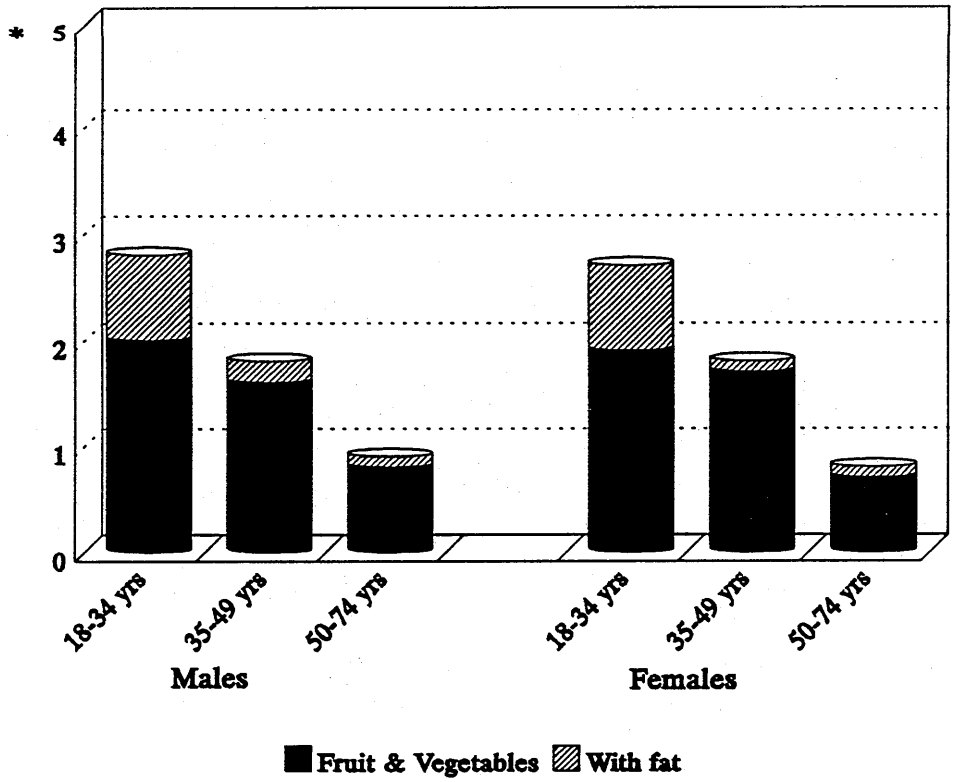
### 3.1.2 Vegetables and fruit

The day before the survey, the mean consumption of vegetables (1.4 servings) and fruit (0.7 servings) among the Inuit population was clearly lower than the minimum intake (5 servings) recommended for the Canadian population. Nevertheless, the level of consumption observed was comparable to that reported by Nobmann *et al.* (1992) among the Native communities of Alaska (including the Inuit) and by Lawn and Langner (1994) among Inuit in the N.W.T. (0.5 to 0.7 servings of fruit and 0.9 to 1.6 servings of vegetables). Also, the present study found that the mean consumption by men and women was quite similar and diminished with age in both cases, dropping from an average 2.7 servings among those aged

18 to 34, to one third this amount (0.8 - 0.9 servings) among people aged 50 to 74 (Graph 3.3).

**GRAPH 3.3**

**Consumption of fruit and vegetables the day before the survey (mean number of servings) [Inuit, 1992]**




* **Minimum number of servings** ***(Canada's Food Guide to Healthy Eating)***

Like southern Quebecers, Inuit consume more vegetables than fruit or fruit juice. On the day before the survey, 66% of them had vegetables, while 29% reported having had fruit or fruit juice. The mean consumption of fruit and vegetables diminished with age (Table 3.2).

## TABLE 3.2

**Breakdown of individuals by age group and sex, according to the number of servings of vegetables and fruit consumed the day before the survey (%) [Inuit, 1992]**

| | MEN | | | WOMEN | | | TOTAL |
|---|---|---|---|---|---|---|---|
| AGE | 18-34 | 35-49 | 50-74 | 18-34 | 35-49 | 50-74 | |
| N | 92 | 64 | 41 | 103 | 70 | 63 | 433 |
| NUMBER OF SERVINGS | | | | | | | |
| VEGETABLES | | | | | | | |
| 0 | 24.1 | 40.2 | 63.8 | 17.8 | 47.7 | 57.2 | 33.4 |
| 0 TO < 2 | 37.8 | 34.8 | 26.6 | 41.4 | 33.3 | 34.2 | 36.6 |
| 2 TO < 5 | 31.5 | 19.5 | 10.6 | 34.1 | 16.2 | 8.6 | 25.0 |
| ≥ 5 | 6.6 | 5.6 | 0.0 | 6.6 | 3.2 | 0.0 | 5.0 |
| FRUIT | | | | | | | |
| 0 | 72.8 | 78.4 | 84.1 | 60.0 | 63.6 | 84.1 | 70.9 |
| 0 TO < 2 | 14.2 | 15.3 | 7.6 | 24.3 | 22.5 | 12.2 | 17.4 |
| 2 TO < 5 | 7.6 | 5.0 | 8.1 | 11.6 | 8.1. | 1.8 | 8.0 |
| ≥ 5 | 5.5 | 1.4 | 0.0 | 4.0 | 5.8 | 1.8 | 3.8 |

Nearly three quarters (70%) of the fruit consumed was in the form of juice but the popularity of juice seemed to diminish with age. Women aged 18 to 49 tended to eat more fresh and dried fruit (0.4 servings, on average) than women in other age groups and men of all ages (0.1 to 0.2 servings).

Few Inuit ate raw vegetables, and only in very small quantities (0.2 servings, on average). Indeed, 74% of Inuit reported having eaten no raw vegetables the day before the survey. Consumption was relatively similar for both men and women.

### 3.1.2.1 Consumption of vegetables and fruit containing fat

On the day covered by the survey, the majority of vegetables and fruit consumed were low in fat (Graph 3.3). The consumption of French fried potatoes and potato chips, which were the only fatty vegetables reported, was higher among young men and women aged 18 to 34, where these foods accounted for 31% of the total vegetable intake for the day (0.8 servings). In this age group, one third of women and one quarter of men had eaten potato chips the day before the survey. There does not appear to be a noticeable difference in the consumption

of potatoes and potato chips according to coast or sector of residence, but the consumption of potato chips was higher in sector B than in sector A (79% and 68% respectively).

### 3.1.2.2 Breakdown of intakes at meals and snacks

Vegetables and fruit were eaten almost exclusively at the noon and evening meals and snacks. The mean consumption of these foods was between 0.6 and 0.8 servings at these times; the intake of fatty vegetables and fruit tended to be concentrated in snacks (0.3 servings). On average, the morning meal supplied only 0.1 servings of fruit and vegetables. On the other hand, the evening meal appeared more likely to contain vegetables, since a majority (54%) of Inuit reported eating them at supper. No-one indicated having consumed fruit or vegetables with at least three of the day's meals.

### 3.1.2.3 Specific foods

Analysis of the Frequency Questionnaire shows that 62% of Inuit had consumed fruit juice during the month preceding the survey; 89% was from fresh fruit and 52% was canned. However, given the frequency of consumption, the fruit was mainly in the form of juice (339 g of juice a day, on average, compared with 107 g of fresh or canned fruit). These figures are consistent with the findings of the 24-hour Recall. Fruit juice seemed less popular among those aged 50 and over. In the month preceding the survey, nearly one quarter of women aged 18 to 49 had drunk fruit juice one to three times a day, whereas this percentage dropped to 14% among women aged 50 and over. The average amount of fresh fruit eaten and their consumption frequency tended to diminish with age, while the intake of canned fruit was comparable for all age groups. During the year preceding the study, 90% of Inuit had consumed wild berries; the consumption level was particularly high in the fall (62.7 g a day, on average) and in summer (48.4 g a day, on average). Women aged 35 to 49 seemed somewhat fonder of these fruit than did younger or older women.

Fruit-flavoured drinks (*Tang* type) were not included in the fruit group, although, on average, they provided more vitamin C than fruit juice (almost twice as much) among the Inuit population studied (section 3.6.2). According to the Frequency Questionnaire, 48% of Inuit had drunk fruit-flavoured drinks during the month preceding the study; the proportion of women who did not consume these drinks was higher among younger women (55%) than older women (41%). Nearly one third of women who reported using fruit drinks had consumed one to three a day; 20% of women aged 50 and over fell into this category. The area of residence seemed to influence the consumption of juice and fruit-flavoured drinks: a larger proportion of Ungava coast residents (59%) reported having drunk *Tang* than did Hudson coast residents (39%). On the other hand, fruit juice was more popular on the Hudson coast than on the Ungava coast (69% vs. 54%) and in sector A (71%) than in sector B (51%).

Ninety-two percent of the 53 households of Arctic Bay questioned by Verdier and associates (1987) reported consuming fruit-flavoured drinks like *Tang*. Moreover, in the Lawn and Langner study (1994), fruit-flavoured drinks (with or without added vitamin C) were consumed in greater quantity and more frequently than fruit juice. For example, in Coral Harbour, fruit juice was consumed around 0.18 times a week, whereas fruit drinks were consumed an average of 12 times a week. In the present survey, the mean quantity of fruit juice consumed in a week varied between 231 and 907 g while the quantity of *Tang*-type drinks ranged between 1895 and 3352 g. It may be that some of the people surveyed confused fruit juice with fruit-flavoured drinks, which would explain why the fruit juice intake (estimated from the 24-hour Recall) seemed somewhat high among the Inuit of Nunavik. However, given the fact that mainly young people reported drinking fruit juice, the difference may be real, young people being somewhat better informed and more familiar with imported foods.

There was little variety in the vegetables consumed the day before the survey: potatoes were most frequently mentioned (37% of individuals), followed by onions/garlic (22%), tomatoes (13%) and carrots (13%). Other vegetables like lettuce, spinach, corn, peas, mushrooms and peppers were eaten by less than 8% of Inuit. Broccoli and cauliflower, which have gained popularity in the south over the past twenty years (SQN, 1990), were consumed by only 1% of Inuit. Overall, more vegetables were consumed along the Ungava coast than along the Hudson coast and slightly more in sector A than in sector B. Consumption of vegetables also appears to be linked to education; a greater proportion of individuals with a secondary or post-secondary education than those having attended only primary school had eaten potatoes, onions, tomatoes, lettuce, corn and other vegetables the day before the survey.

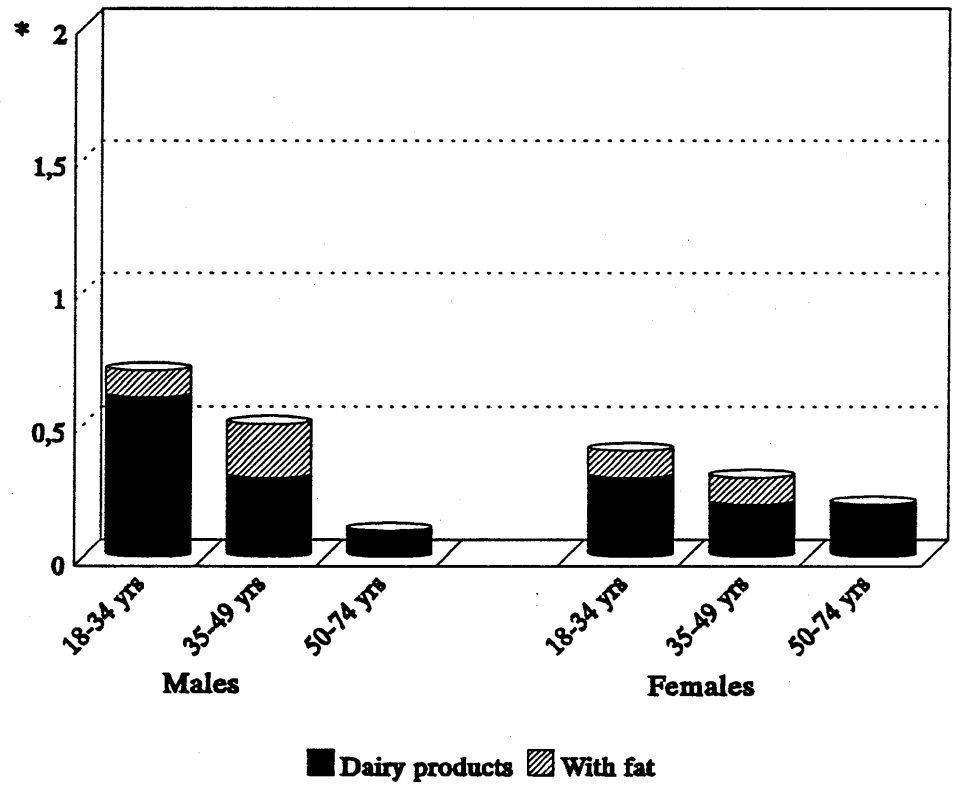
The findings of the 24-hour Recall concerning vegetables are consistent with the answers given in the Frequency Questionnaire. Potatoes, carrots and corn (canned) were the principal vegetables eaten by women during the month preceding the survey. Between 65 and 77% of women had consumed potatoes (fresh, mashed, French fried or in the form of potato chips); French fries and potato chips were mentioned more frequently among women aged 18 to 34; over one third (36%) of women in this age group had consumed French fries from one to three times a week, compared with less than one quarter (23%) of women over age 50. The finding was the same for potato chips, where 18% of young women had eaten them from one to three times a day, compared with 8% of older women. Around two thirds of the women surveyed had eaten fresh carrots (65%) or canned corn (61%) during the month preceding the survey and only 20% had eaten canned tomatoes. Overall, these findings indicate that there is little variety in the vegetables available to and eaten by the Inuit of Nunavik.

## 3.1.3 Dairy products

Consumption of dairy products was very low, averaging 0.5 servings the day before the survey, compared with the minimum of two servings recommend by *Canada's Food Guide to Healthy Eating*. The mean intake among young adults aged 18 to 34 did not reach a full serving (0.7 for men and 0.5 for women) while among those aged 50 to 74, it reached only 0.1 to 0.2 servings (Graph 3.4).

**GRAPH 3.4**

**Consumption of dairy products the day before the survey (mean number of servings) [Inuit, 1992]**




* Minimum number of servings *(Canada's Food Guide to Healthy Eating)*

According to the 24-hour Recall, the largest proportion of non-consumers of dairy products were men and women aged 50 to 74 (Table 3.3). Not more than 5% of Inuit men and women of all ages had consumed the recommended minimum two servings. None of the women had

consumed more than four servings the day of the survey, whereas 3% of the men had. Although mean consumption of dairy products among this population is very low when compared to the quantities recommended by *Canada's Food Guide to Healthy Eating*, it appears that calcium absorption is more efficient in populations whose calcium intake is generally low (Allen and Wood, 1994).

**TABLE 3.3**

**Breakdown of individuals by age group and sex, according to the number of servings of dairy products consumed the day before the survey (%) [Inuit, 1992]**

| | MEN | | | WOMEN | | | TOTAL |
|---|---|---|---|---|---|---|---|
| AGE | 18-34 | 35-49 | 50-74 | 18-34 | 35-49 | 50-74 | |
| N | 92 | 64 | 41 | 103 | 70 | 63 | 433 |
| NUMBER OF SERVINGS | | | | | | | |
| 0 | 53.5 | 45.1 | 71.1 | 38.8 | 41.1 | 65.8 | 49.4 |
| 0 TO < 2 | 36.9 | 49.1 | 29.5 | 56.6 | 57.0 | 33.1 | 45.4 |
| 2 | 4.2 | 2.8 | 0.0 | 3.9 | 1.3 | 0.0 | 2.9 |
| ≥3 | 5.4 | 3.2 | 0.0 | 0.8 | 0.0 | 0.0 | 2.3 |

### 3.1.3.1 Consumption of dairy products containing fat

On average, one fifth of the dairy product servings consumed by Inuit the day before the survey were high in fat (i.e. supplied 5 g more fat than the reference serving). No woman over age 35 and no man aged 50 to 74 had consumed milk products with a high fat content, but 40% of men aged 35 to 49 had (Graph 3.4). No milk products high in sugar (i.e. containing 5 g more sugar than the reference serving) had been consumed the day before the survey.

Consumption of low-fat dairy products (skimmed or partly skimmed milk, yogurt, cheese containing less than 20% fat) was negligible among the population studied: 97% of individuals had eaten none and the remaining 3% had eaten less than one serving during the day covered by the survey.

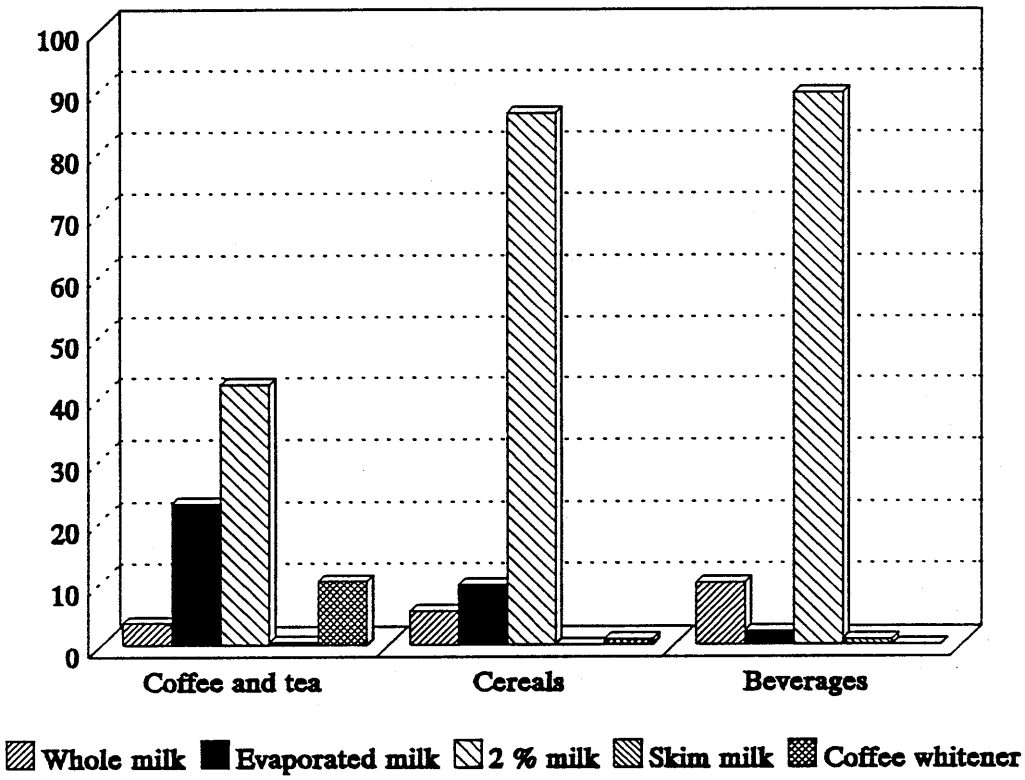
### 3.1.3.2 Specific foods

Milk and yogurt contributed, on average, 89% of the intake (in grams) of dairy products consumed by the Inuit population; cheese represented 7% of intake and cream (coffee cream and whipping cream) and ice cream, 3%. Dairy products were consumed in small quantities and mean consumption seemed to diminish with age. Thus, the Inuit derive less energy and calcium from dairy products than the southern Québec population. The mean quantities of milk and yogurt consumed the day before the survey were higher on the Ungava coast (119 g) than on the Hudson coast (47 g). Cheese and cream were also more popular on the Ungava coast.

This tendency to consume fewer dairy products with age is also reflected in the findings of the Frequency Questionnaire. Compared with other age groups, a greater proportion of women over age 50 had not eaten cheese during the month preceding the study. The average intake found in the population studied was equal to about one serving. Moreover, as in the Québec population, fresh 2% milk was favoured by Inuit women for all uses: in coffee, on cereal, or as a beverage (Graph 3.5). Fresh whole milk and evaporated milk (whole) were used by one quarter of women who drank coffee or tea. On the other hand, whole milk (fresh or powdered) was not very popular and skim milk was practically never used. About 10% of women used a coffee whitener, which contained no calcium. The percentage of women using milk (fresh or powdered) diminished with age; the older women consumed more evaporated milk than the younger ones and were proportionally more numerous in not using milk in their tea or coffee. More than one quarter of Inuit did not eat cereals and approximately one half did not use milk as a beverage.

**GRAPH 3.5**

**Percentage of women using different types of milk or milk substitutes for various purposes during the month preceding the survey [Inuit, 1992]**

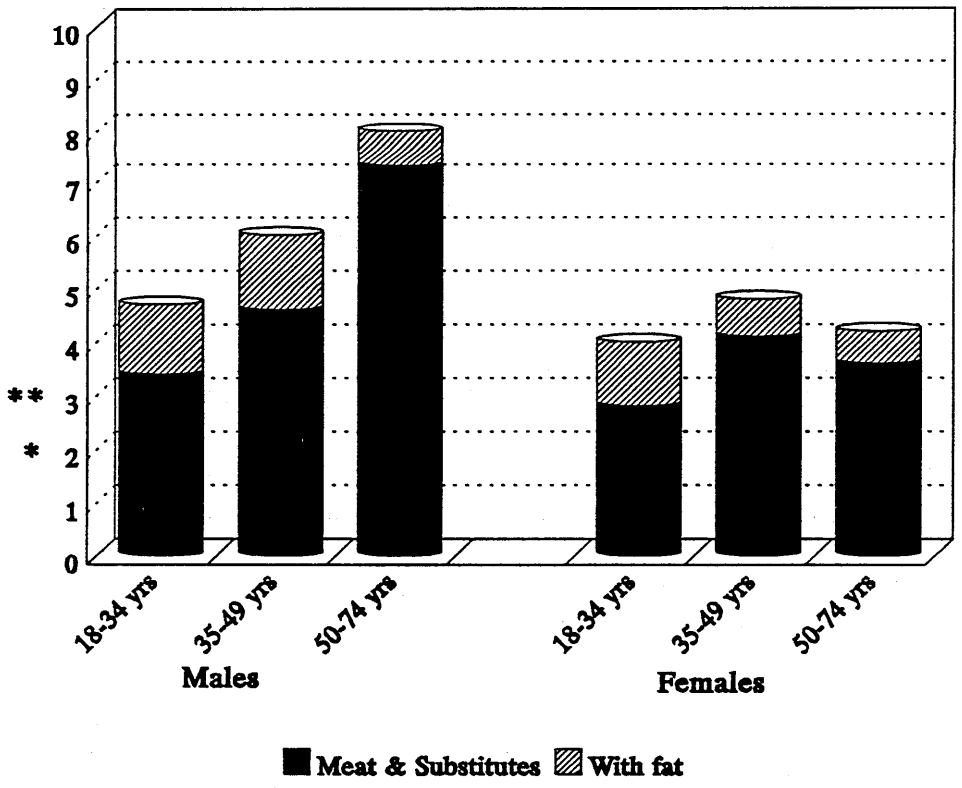



## 3.1.4 Meat and meat substitutes

On the day before the survey, the mean consumption of meat and meat substitutes was 4.9 servings among the Inuit. For all ages and both sexes, the level of consumption exceeded the 2 to 3 servings recommended by *Canada's Food Guide to Healthy Eating* (Graph 3.6). The mean intake was particularly high among men aged 50 to 74 (8 servings) and lowest among women aged 18 to 34 (4 servings). These levels are also reflected in their protein and lipid intakes (section 3.6.1). The consumption of meat substitutes was not widespread among the Inuit: less than one quarter (23%), mainly women 18 to 34 years old, had eaten them on the day before the survey. These substitutes included eggs, peanut butter and canned baked beans.

## GRAPH 3.6

**Consumption of meat and meat substitutes the day before the survey (mean number of servings) [Inuit, 1992]**




* Minimum number of servings *(Canada's Food Guide to Healthy Eating)*

** Maximum number of servings *(Canada's Food Guide to Healthy Eating)*

Table 3.4 indicates that despite high mean intakes among the population studied, 5% of Inuit had not eaten any meat or meat substitute the day before the survey. But 12%, mostly men aged 50 to 74, had eaten ten or more servings of meat and meat substitutes. The amount of meat consumed may have been overestimated, particularly meat from game or marine mammals, since it does not match the size of portions normally sold in a grocery store. In this context, Kinloch, Kuhnlein and Muir (1992) reported wide variability in the average quantities of meat consumed daily in an Inuit community in Baffin Island, where amounts ranged from 125 to 635 g depending on the type of meat eaten.

## TABLE 3.4

**Breakdown of individuals by age group and sex, according to the number of servings of meat and meat substitutes consumed the day before the survey (%) [Inuit, 1992]**

| | MEN | | | WOMEN | | | TOTAL |
|---|---|---|---|---|---|---|---|
| AGE | 18-34 | 35-49 | 50-74 | 18-34 | 35-49 | 50-74 | |
| N | 92 | 64 | 41 | 103 | 70 | 63 | 433 |
| NUMBER OF SERVINGS | | | | | | | |
| 0 | 9.8 | 0.0 | 0.0 | 4.2 | 1.6 | 4.3 | 4.6 |
| 0 TO < 2 | 8.1 | 5.9 | 11.2 | 28.9 | 22.6 | 25.7 | 17.4 |
| 2-3 | 34.3 | 37.7 | 28.2 | 35.1 | 25.3 | 22.0 | 32.4 |
| 4-5 | 21.7 | 16.7 | 11.8 | 16.3 | 22.8 | 21.7 | 18.7 |
| 6 TO <10 | 22.1 | 31.8 | 16.4 | 6.0 | 18.9 | 20.8 | 15.1 |
| ≥ 10 | 9.9 | 15.7 | 31.5 | 9.5 | 8.6 | 5.2 | 11.8 |

### 3.1.4.1 Consumption of meat and meat substitutes and fat content

Nearly one quarter (22%) of the servings of meat and meat substitutes consumed by Inuit the day before the survey were high in fat (i.e. contained 5 g more fat than a reference food). Consumption of these foods was found mainly among men aged 18 to 49 and women under age 35 (Graph 3.6). Meat and meat substitutes with a high fat content included pork eaten with the fat, chicken (with the skin), processed meats and sausages, which supplied on average 11% of lipid intake.

### 3.1.4.2 Breakdown of intakes at meals and snacks

According to the 24-hour Recall, meat and meat substitutes were mainly eaten at the noon meal (2.5 servings) and the evening meal (2.1 servings). On average, breakfast included only 0.2 meat servings, and snacks practically none. These trends were seen in all age groups for both sexes.

### 3.1.4.3 Specific foods

Game and wildfowl (including caribou, marine mammals, goose and duck), meat and poultry and fish each contributed roughly 30% of total intakes of the meat and meat substitutes group. Thus the traditional foods eaten, including game, wildfowl and most fish, made a significant contribution to the total intake of meat and meat substitutes. The average consumption of traditional foods (game, wildfowl and fish) increased with age among both men and women and was particularly high among men aged 50 to 74. This partially corroborates the findings on the perception of traditional foods, which was less positive among the younger people (Delisle *et al.*, 1994). Among traditional foods consumed the day before the survey, game (mainly caribou) ranked first (87.4 g on average), followed by fatty fish (65.6 g), lean fish (20.0 g) and wildfowl (7.4 g). Among men, mean consumption of these foods seemed to increase with age, whereas among women, consumption was as high among those 35 to 49 years old as among those over age 50. The contribution of traditional foods to energy and nutritional intakes will be discussed later on in section 3.6.

Women's answers to the Frequency Questionnaire confirm the 24-hour Recall findings suggesting that older people prefer traditional foods to imported foods. For example, during the month preceding the survey, proportionally more women aged 50 and over reported not consuming imported meat than did younger women (imported meat included chicken breasts, pork chops and wieners). On the other hand, consumption of ground beef, breaded chicken, fish sticks and processed meats appeared to be unrelated to age.

Table 3.5 shows the percentage of women having consumed certain imported meat and meat substitutes during the month preceding the survey and the consumption frequency. Over half (55%) of women had eaten pork chops, breaded chicken, fish sticks, ground beef and processed meats, and most had eaten them one to three times a month. As for meat substitutes, over half of the women had eaten eggs one to three times a week during the month preceding the survey and 16% had eaten them one to three times a day. Canned baked beans and peanut butter were less popular. Peanut butter was eaten more frequently among the younger women; no woman over age 50 reported having eaten this food.

**TABLE 3.5**

**Percentage of women having consumed certain meats and meat substitutes during the month preceding the survey [Inuit, 1992]**

| MEAT AND MEAT SUBSTITUTES | % INDIVIDUALS HAVING CONSUMED | % AMONG THE INDIVIDUALS HAVING CONSUMED | |
|---|---|---|---|
| | | 1-3 T./MO. | 1-3 T./WEEK |
| GROUND BEEF | 61.5 | 56.0 | 42.4 |
| CORNED BEEF, CANNED | 33.3 | 71.4 | 28.6 |
| CHICKEN (BREAST) | 83.8 | 48.3 | 48.4 |
| BREADED CHICKEN | 54.8 | 55.7 | 43.0 |
| PORK (CHOPS) | 71.0 | 60.2 | 38.3 |
| BREADED FISH STICKS | 22.1 | 78.2 | 21.8 |
| CANNED SALMON | 45.8 | 82.0 | 18.0 |
| WIENERS | 61.1 | 51.8 | 42.2 |
| PACKAGED PROCESSED MEAT | 52.2 | 63.6 | 35.2 |
| PEANUT BUTTER | 28.7 | 41.5 | 43.9 |
| BAKED BEANS (CANNED) | 29.6 | 56.8 | 38.1 |
| EGGS | 87.6 | 25.5 | 51.1 |

## 3.1.5 Sugar and fats

### 3.1.5.1 Butter, margarine, fats and oils

As reported for the SQN survey (1990), although *Canada's Food Guide to Healthy Eating* offers no precise guidelines as to quantity when it comes to fats (butter, margarine, other fats and oils), sugars (sugar, syrups, jams and sweeteners) and candy, it is still useful to consider consumption of these items because they are used daily and are the subject of numerous educational messages.

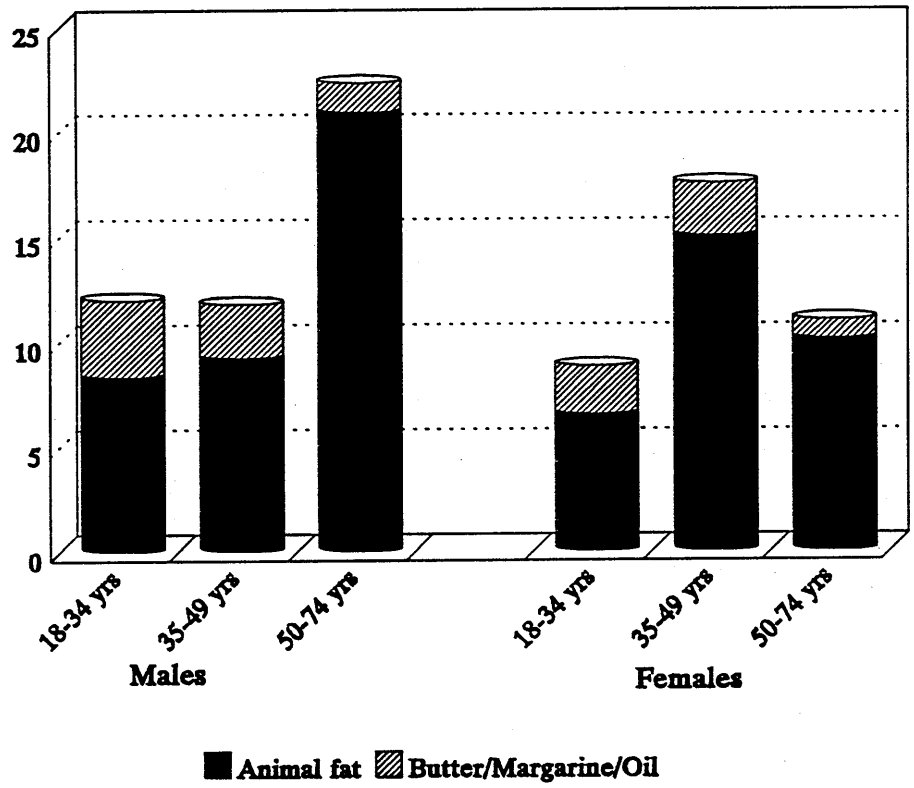
Unlike in the Québec population, the main fats in the Inuit diet are not limited only to butter, margarine and oils, but also include animal and game fat. The day before the survey, for all ages and both sexes, the mean number of animal and game fat equivalents consumed (excluding butter) was higher than that of imported fats (Graph 3.7). (It should be noted that any reference to animal fat includes the lard used in making bannock and pan-frying meat.)

Among men, the average intake of animal and game fat increased with age, reaching 104.5 g or nearly 21 equivalents in the 50-74 age group. The amount of imported fats consumed seemed to diminish gradually with age, but the total quantity of fat ingested remained highest among older men. This is consistent with the INDIGRAS composite index of fat consumption, where younger Inuit have a lower index, reflecting a lower fat intake (Delisle *et al.*, 1994). Women in the 35-49 age group showed the highest consumption of animal and game fat (a mean of 75 g or around 15 equivalents) and their total fat ingestion (17.5 equivalents) was also higher than women in other age groups. Animal and game fat and lard represented at least one third of intakes for the various age groups in both sexes, except for women aged 35 to 49, where it supplied around one quarter of total intake. Among women age 50 and over, lard represented, on average, half the quantity of animal and game fat ingested, mainly because of a high consumption of bannock. Over half (59%) of the population reported having eaten lard the day before the survey. Of these persons, proportionally more were men and women aged 50 to 74 (at least 80% of this age group). The average quantities of lard ingested ranged from 20.3 to 51.8 g, with older men at the higher end of the scale. Only 21% of the Inuit taking part in the survey had eaten fat from game (**blubber** and ***misirak***), with proportionally fewer women aged 18 to 34 (13%) having consumed these foods. Beluga blubber was eaten more often (12%) than other game fat. Details of game fat consumption are presented in section 3.6.

## GRAPH 3.7

**Number of fat equivalents consumed the day before the survey, according to age and sex [Inuit, 1992]**

(1 equivalent = 5 g of fat)




On average, butter was the most widely used imported fat among the Inuit the day before the survey. However, the diet of men aged 35 to 49 contained comparable mean amounts of butter, margarine and oil. More than one third (35%) of the individuals had eaten butter the day under study, with mean intake ranging from 9.4 to 19.9 g, depending on age and sex. Men in the 18-34 age group reported the highest consumption, and women of the same age the lowest. Roughly one quarter of the individuals had eaten soft margarine the day before the survey, and 20% had consumed vegetable oil. Mean quantity of margarine was between 5 and 10 g and that of oil, between 4.2 and 14.5 g, depending on age and sex.

Proportionally more Inuit along the Hudson coast (64%) than along the Ungava coast (51%) had consumed lard the day before the survey, but the mean quantity was roughly the same for both regions. On the other hand, a larger proportion of Ungava coast residents had eaten imported fats (mainly butter) than had Hudson coast residents (49% vs. 25%) and the amounts eaten were also higher along the Ungava coast (Graph 3.8). Although residents of the Ungava coast made greater use of imported fats than those living along the Hudson coast, the average total quantity of fat was similar for the two regions. These findings are consistent with previous findings on dietary behaviour (Delisle *et al.*, 1994). The consumption of dietary fat appeared to vary with the level of education. Lard consumption among less-educated individuals was 73%, against 27% among the better educated. Moreover, the mean number of animal and game fat equivalents appeared higher among the less educated (10.2 equivalents) than among the better educated (7.0 equivalents). On the other hand, a larger proportion of the better-educated individuals had eaten butter (63% vs. 28%). No significant difference in fat consumption was found between the sectors.

**GRAPH 3.8**

**Number of fat and sugar equivalents consumed the day before the survey, according to coast of residence [Inuit, 1992]**

(1 equivalent = 5 g)

### 3.1.5.2 Sugar

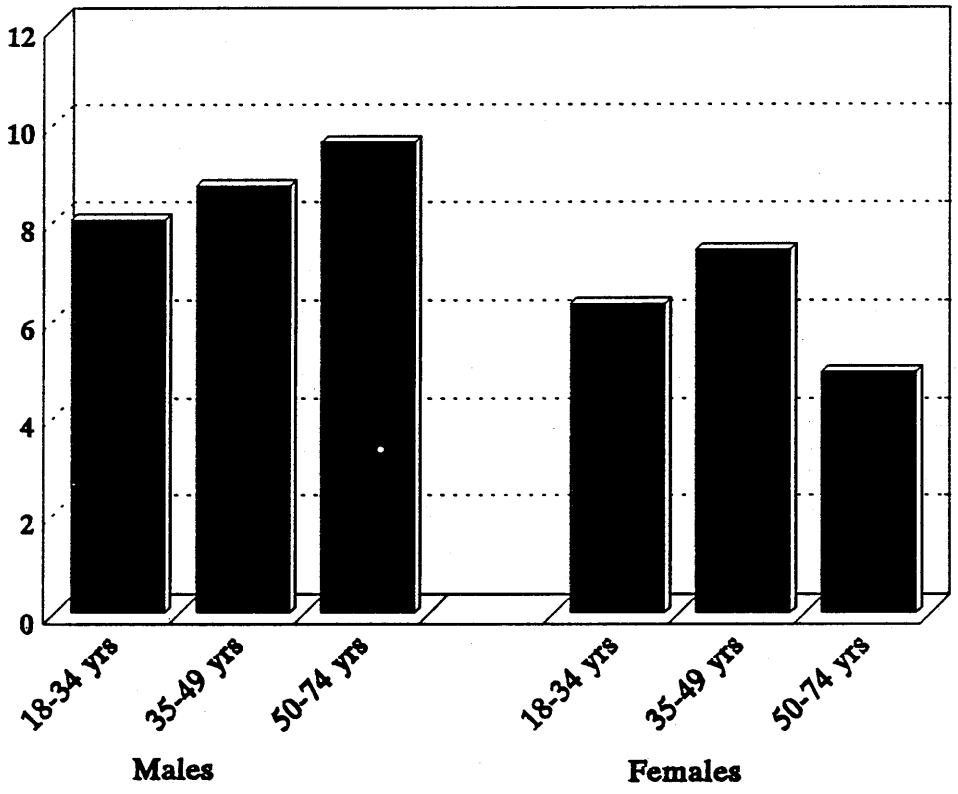
The sugar consumption profile was similar to the one for fats (Graph 3.9). Mean consumption of sugars noted the day before the survey increased with age in men and was higher in women aged 35 to 49. The average number of sugar equivalents ingested was higher in men (about 9) than in women (about 6). Granulated sugar was the main contributor to the higher consumption of sugar in older men, who used it mainly in tea. Chocolate bars were particularly popular in young people aged 18 to 34, while other types of sweets were, on average, seldom consumed in the population studied. The Inuit had not used sweeteners the day covered by the survey. The mean quantity of sugar consumed did not vary with the sector or coast of residence (Graph 3.8). However, individuals with a higher level of

education had consumed, on average, more sugar (10.1 equivalents) than people with less education (6.7 equivalents).

**GRAPH 3.9**

**Number of sugar equivalents consumed the day before the survey, according to age and sex [Inuit, 1992]**

(1 equivalent = 5 g of sugar)




- **Other sugar-containing foods**

The mean quantity of soft drinks consumed by Inuit the day before the survey was about 250 g. Young people between the ages of 18 and 34 were the biggest consumers of these drinks (367 g and 331 g, on average, for men and women). The day before the recall, men aged 50 and over had consumed nearly twice as much sugar, on average, as women the same age (140 g vs. 72 g). Consumption of soft drinks was relatively frequent among the Inuit: more than one third (35%) of women aged 18 to 34 and 20% of older women had some one to three times a day, and nearly 12% of young women four or more times a day during the month preceding the survey. The popularity of soft drinks in Inuit communities in Canada and

the United States was also reported by other authors (Lawn and Langner, 1994; Kinloch, Kuhnlein, Muir, 1992; Nobmann *et al.*, 1992).

According to the findings of a study on the Inuit perception of the link between food and health, the negative influence of junk food (food said to contain empty calories) on health is less perceived by young people[1] (Delisle *et al.*, 1994). This could explain in part the higher consumption of junk food like soft drinks and chocolate bars in young people between the ages of 18 and 34. Finally, the mean consumption of diet soft drinks the day before the survey (4.1 g) was negligible in this population.

## 3.2 MEALS AND SNACKS

The concept of meal versus snack was defined earlier, but these terms were basically used in reference to the times indicated by the respondents. It should be noted that the Inuit may have a different idea of what is generally meant by meal and snack.

The mid-day meal seemed to be the most popular; approximately 95% of men and women reported having taken this meal the day before the survey. More women (82%) than men had eaten a morning meal; it was primarily young people between the ages of 18 and 34 who skipped this meal (37% had not had it). Six percent of men and 2% of women reported eating a night meal. About two thirds of the Inuit had eaten a snack in the afternoon and in the evening.

## 3.3 USE OF NUTRITIONAL SUPPLEMENTS

Among the men surveyed, only those aged 18 to 34 had used nutritional supplements during the month preceding the survey (Table 3.6). Supplements were reported more frequently by women aged 35 and up than by younger ones. Among individuals who had consumed supplements, 62% had taken vitamin C supplements. Women between the ages of 18 and 34 had taken only iron as a supplement, while those in the 50-74 age group had taken iron and calcium.

The small number of individuals having taken supplements the day before the survey does not permit detailed analysis of the findings. However, the use of nutritional supplements was appreciably the same for all individuals, regardless of schooling, sector or coast of residence.

(1) Note that in the Santé Québec Health Survey Among the Inuit of Nunavik, 1992, younger people included subjects between the ages of 15 and 24.

**TABLE 3.6**

**Percentage of individuals having consumed at least one type of supplement during the month preceding the survey, according to age and sex [Inuit, 1992]**

| AGE (YEARS) | 18-34 | 35-49 | 50-74 | ALL AGES | TOTAL |
|---|---|---|---|---|---|
| MEN | 4.6 | 0.0 | 0.0 | 1.5 | 2.7 |
| WOMEN | 0.8 | 6.9 | 4.4 | 4.0 | |

## 3.4 ENERGY AND NUTRIENT INTAKES AMONG THE INUIT

This section focuses on the energy and nutrient intakes estimated from the 24-hour Recall. While intakes for all nutrients are presented in Tables 3.7 and 3.8, the discussion below covers only those nutrients for which intakes seem marginal (vitamins A, C, D, folic acid and calcium) and nutrients that are particularly interesting because they are found primarily in traditional foods (e.g. iron, zinc and vitamin $B_6$). Note that alcohol is not included in these tables, the mean intakes observed being low (between 1 and 4 g).

Mean and median intakes observed in the Inuit population according to age and sex are presented in Table 3.7. However, only median intakes are analyzed, as they provide a better illustration of the trend underlying the data collected. (Mean intakes are presented for information purposes only). Table 3.8 shows the nutritional density of the population's diet, i.e. the nutrient intakes per 1,000 kilocalories. Because total energy consumption varies with age and sex, it was found relevant to assess the nutritional quality of a diet by expressing intakes in this form. Given that expressing the nutritional intake per 1,000 kcal partly attenuates the importance of extreme quantities, the mean (as opposed to median) intake per 1,000 kcal was used.

General information on energy and nutrient intakes according to certain sociodemographic characteristics (age, sex, geographic sector and level of education) is presented first, followed by the breakdown according to proteins, carbohydrates, lipids and alcohol (section 3.5), and the contribution of foods to energy and nutrients (section 3.6). The comparisons presented here should be approached with circumspection. The differences noted in the text may, in some cases, make no significant statistical difference given the variability of the nutritional data at hand. This is particularly the case, for example, with intakes in vitamin A.

## TABLE 3.7

### Mean and median energy and nutrient intakes the day before the survey, according to age and sex [Inuit, 1992]

| | | MEN | | | WOMEN | | |
|---|---|---|---|---|---|---|---|
| AGE | | 18-34 | 35-49 | 50-74 | 18-34 | 35-49 | 50-74 |
| N | | 92 | 64 | 41 | 103 | 70 | 63 |
| ENERGY (kcal) | mean | 2366 | 2188 | 2557 | 1851 | 1885 | 1590 |
| | median | 2221 | 1958 | 2507 | 1709 | 1810 | 1509 |
| PROTEIN (g) | mean | 104 | 110 | 151 | 84.5 | 100 | 82.3 |
| | median | 85.8 | 99.7 | 136 | 69.5 | 92.2 | 71.0 |
| LIPIDS (g) | mean | 98.0 | 96.8 | 120 | 75.7 | 92.2 | 72.8 |
| | median | 90.7 | 83.7 | 110 | 64.7 | 81.2 | 57.1 |
| SAT. FATTY ACIDS (g) | mean | 31.5 | 28.2 | 34.6 | 23.5 | 24.8 | 22.4 |
| | median | 27.0 | 24.6 | 26.7 | 20.5 | 19.7 | 18.6 |
| MONOUNSAT. F.A. (g) | mean | 42.8 | 40.9 | 58.1 | 34.6 | 44.2 | 33.5 |
| | median | 34.8 | 33.5 | 45.2 | 25.4 | 30.7 | 25.5 |
| POLYUNSAT. F.A. (g) | mean | 13.2 | 13.0 | 14.3 | 10.4 | 11.2 | 9.53 |
| | median | 11.6 | 11.4 | 12.9 | 8.70 | 10.6 | 8.96 |
| LINOLENIC ACID (g) n-3 | mean | 2.57 | 3.67 | 4.48 | 1.88 | 3.23 | 2.42 |
| | median | 1.64 | 1.98 | 2.67 | 1.30 | 1.57 | 1.57 |
| LINOLEIC ACID (g) n-6 | mean | 8.61 | 8.31 | 9.44 | 7.43 | 6.98 | 6.35 |
| | median | 6.83 | 5.92 | 8.32 | 6.41 | 6.19 | 5.04 |
| CHOLESTEROL (mg) | mean | 398 | 380 | 531 | 336 | 317 | 285 |
| | median | 264 | 321 | 459 | 252 | 289 | 213 |
| CARBOHYDRATES (g) | mean | 256 | 202 | 220 | 208 | 175 | 151 |
| | median | 216 | 174 | 209 | 188 | 146 | 134 |
| DIETARY FIBRE (g) | mean | 8.20 | 7.20 | 6.18 | 7.51 | 7.02 | 4.95 |
| | median | 6.08 | 4.82 | 5.01 | 6.52 | 6.24 | 3.37 |
| CALCIUM (mg) | mean | 554 | 454 | 452 | 402 | 361 | 316 |
| | median | 341 | 325 | 398 | 347 | 309 | 265 |
| MAGNESIUM (mg) | mean | 224 | 223 | 209 | 183 | 182 | 155 |
| | median | 188 | 187 | 194 | 175 | 166 | 135 |
| PHOSPHORUS (mg) | mean | 1297 | 1351 | 1729 | 1059 | 1159 | 967 |
| | median | 1160 | 1176 | 1475 | 909 | 1018 | 830 |
| POTASSIUM (mg) | mean | 2426 | 2457 | 2304 | 2106 | 2017 | 1576 |
| | median | 2096 | 2394 | 1984 | 1851 | 1742 | 1551 |

... continued on next page ...

| | | MEN | | | WOMEN | | |
|---|---|---|---|---|---|---|---|
| AGE | | 18-34 | 35-49 | 50-74 | 18-34 | 35-49 | 50-74 |
| N | | 92 | 64 | 41 | 103 | 70 | 63 |
| IRON (mg) | mean | 16.8 | 19.3 | 28.9 | 14.4 | 19.0 | 17.0 |
| | median | 13.0 | 12.8 | 15.8 | 10.1 | 13.7 | 13.2 |
| ZINC (mg) | mean | 11.4 | 10.9 | 11.6 | 8.60 | 11.6 | 7.50 |
| | median | 9.11 | 9.71 | 6.89 | 7.66 | 8.20 | 6.23 |
| SODIUM (mg) | mean | 2733 | 2695 | 3111 | 2275 | 2001 | 1884 |
| | median | 2204 | 2123 | 2196 | 1691 | 1705 | 1214 |
| VITAMIN A (µgER) | mean | 651 | 753 | 753 | 802 | 678 | 429 |
| | median | 390 | 372 | 186 | 299 | 402 | 202 |
| CAROTENE (µgER) | mean | 203 | 261 | 152 | 202 | 164 | 133 |
| | median | 37 | 15 | 3.88 | 28 | 17 | 1.84 |
| TOTAL VITAMIN D (µg) | mean | 3.64 | 3.24 | 3.85 | 2.48 | 3.09 | 2.27 |
| | median | 1.94 | 3.12 | 1.15 | 1.78 | 2.00 | 1.37 |
| NATURAL VITAMIN D (µg) | mean | 2.01 | 2.14 | 3.44 | 1.44 | 2.30 | 1.64 |
| | median | 0.92 | 1.76 | 0.99 | 0.79 | 1.25 | 1.00 |
| ADDED VITAMIN D (µg) | mean | 1.63 | 1.10 | 0.41 | 1.04 | 0.79 | 0.63 |
| | median | 0.05 | 0.45 | 0.00 | 0.39 | 0.34 | 0.00 |
| VITAMIN E (mgET) | mean | 6.70 | 7.88 | 7.81 | 7.04 | 6.56 | 4.12 |
| | median | 5.49 | 4.61 | 4.59 | 5.06 | 3.89 | 2.31 |
| VITAMIN C (mg) | mean | 82.4 | 42.4 | 34.5 | 69.0 | 55.8 | 24.6 |
| | median | 37.0 | 20.9 | 7.8 | 29.9 | 17.5 | 7.6 |
| THIAMINE (mg) | mean | 1.55 | 1.65 | 2.02 | 1.22 | 1.41 | 1.09 |
| | median | 1.31 | 1.40 | 1.42 | 1.00 | 1.36 | 0.87 |
| RIBOFLAVIN (mg) | mean | 2.08 | 2.14 | 2.90 | 1.67 | 1.87 | 1.56 |
| | median | 1.65 | 1.87 | 2.03 | 1.40 | 1.73 | 1.34 |
| NIACIN (mgEN) | mean | 43.9 | 47.3 | 64.5 | 37.9 | 33.2 | 35.2 |
| | median | 38.5 | 41.0 | 55.0 | 30.5 | 38.1 | 28.4 |
| VITAMIN $B_6$ (mg) | mean | 1.44 | 1.44 | 1.51 | 1.19 | 1.12 | 0.95 |
| | median | 1.26 | 1.24 | 1.04 | 1.04 | 1.01 | 0.83 |
| FOLIC ACID (µg) | mean | 162 | 172 | 174 | 142 | 159 | 122 |
| | median | 134 | 137 | 151 | 122 | 138 | 110 |
| VITAMIN $B_{12}$ (µg) | mean | 9.35 | 17.3 | 19.4 | 10.9 | 16.3 | 12.0 |
| | median | 5.46 | 7.72 | 9.54 | 5.41 | 7.08 | 6.12 |
| PANTOTHENIC ACID (mg) | mean | 7.69 | 7.60 | 12.6 | 6.72 | 9.32 | 6.54 |
| | median | 4.98 | 6.39 | 7.11 | 4.48 | 6.04 | 4.15 |
| CAFFEINE (mg) | mean | 242 | 398 | 354 | 263 | 364 | 278 |
| | median | 179 | 284 | 284 | 149 | 237 | 237 |

## TABLE 3.8

### Mean nutrient intakes/1,000 kilocalories the day before the survey, according to age and sex [Inuit, 1992]

| | MEN | | | WOMEN | | | |
|---|---|---|---|---|---|---|---|
| AGE | 18-34 | 35-49 | 50-74 | 18-34 | 35-49 | 50-74 | TOTAL |
| N | 92 | 64 | 41 | 103 | 70 | 63 | 433 |
| PROTEINS (g) | 43.9 | 50.4 | 59.2 | 45.7 | 53.1 | 51.8 | 48.3 |
| LIPIDS (g) | 41.42 | 44.23 | 46.88 | 40.87 | 48.90 | 45.80 | 43.28 |
| SAT. FATTY ACIDS (g) | 13.32 | 12.89 | 13.52 | 12.69 | 13.17 | 14.09 | 13.16 |
| MONOUNSAT. F.A. (g) | 18.06 | 18.70 | 22.72 | 18.68 | 23.44 | 21.10 | 19.54 |
| POLYUNSAT. F.A. (g) | 5.56 | 5.94 | 5.60 | 5.64 | 5.94 | 5.99 | 5.70 |
| LINOLENIC ACID (g) n-3 | 1.08 | 1.68 | 1.75 | 1.01 | 1.71 | 1.53 | 1.31 |
| LINOLEIC ACID (g) n-6 | 3.64 | 3.80 | 3.69 | 4.02 | 3.70 | 4.00 | 3.79 |
| CHOLESTEROL (mg) | 168 | 173 | 208 | 182 | 168 | 179 | 177 |
| CARBOHYDRATES (g) | 108 | 92 | 86 | 113 | 93 | 95 | 102 |
| DIETARY FIBRE (g) | 3.46 | 3.29 | 2.42 | 4.06 | 3.72 | 3.11 | 3.48 |
| CALCIUM (mg) | 234 | 207 | 177 | 217 | 192 | 199 | 213 |
| MAGNESIUM (mg) | 95 | 102 | 82 | 99 | 96 | 97 | 96 |
| PHOSPHORUS (mg) | 548 | 617 | 676 | 572 | 615 | 608 | 588 |
| POTASSIUM (mg) | 1025 | 1123 | 901 | 1138 | 1070 | 991 | 1057 |
| IRON (mg) | 7.09 | 8.83 | 11.29 | 7.76 | 10.08 | 10.70 | 8.49 |
| ZINC (mg) | 4.80 | 4.98 | 4.53 | 4.65 | 6.15 | 4.71 | 4.88 |
| SODIUM (mg) | 1155 | 1232 | 1216 | 1229 | 1061 | 1185 | 1184 |
| VITAMIN A (µgER) | 275 | 344 | 294 | 433 | 359 | 270 | 335 |
| CAROTENE (µgER) | 86 | 119 | 60 | 109 | 87 | 83 | 94 |
| TOTAL VITAMIN D (µg) | 1.54 | 1.48 | 1.50 | 1.34 | 1.64 | 1.43 | 1.48 |
| NATURAL VITAMIN D (µg) | 0.85 | 0.98 | 1.34 | 0.78 | 1.22 | 1.03 | 0.95 |
| ADDED VITAMIN D (µg) | 0.69 | 0.50 | 0.16 | 0.56 | 0.42 | 0.40 | 0.53 |
| VITAMIN E (mgET) | 2.83 | 3.60 | 3.05 | 3.80 | 3.48 | 2.59 | 3.26 |
| VITAMIN C (mg) | 34.83 | 19.36 | 13.48 | 37.25 | 29.59 | 15.47 | 29.18 |
| THIAMINE (mg) | 0.66 | 0.75 | 0.79 | 0.66 | 0.75 | 0.69 | 0.69 |
| RIBOFLAVIN (mg) | 0.88 | 0.98 | 1.13 | 0.90 | 0.99 | 0.98 | 0.94 |
| NIACIN (mgEN) | 18.55 | 21.60 | 25.21 | 20.48 | 22.94 | 22.13 | 20.85 |
| VITAMIN $B_6$ (mg) | 0.61 | 0.66 | 0.59 | 0.64 | 0.60 | 0.60 | 0.62 |
| FOLIC ACID (µg) | 69 | 78 | 68 | 77 | 85 | 77 | 74 |
| VITAMIN $B_{12}$ (µg) | 3.95 | 7.90 | 7.57 | 5.90 | 8.63 | 7.53 | 6.09 |
| PANTOTHENIC ACID (mg) | 3.25 | 3.47 | 4.92 | 3.63 | 4.94 | 4.11 | 3.78 |
| CAFFEINE (mg) | 102 | 182 | 138 | 142 | 193 | 175 | 141 |

## 3.4.1 Energy and macronutrients[1]

**• Difference according to sex**

Median intakes in energy, **macronutrients** and caffeine, as estimated from the 24-hour Recall, were generally higher among men than women (Table 3.7). On the other hand, intakes in macronutrients per 1,000 kcal were similar for both sexes, except perhaps for vitamin C, dietary fibre and caffeine, which were slightly more concentrated in the diet of women (Table 3.8).

**• Difference according to age**

It is interesting to note that the Inuit median energy intakes did not diminish linearly with age as is generally found in food surveys for the Canadian population. Median energy intakes in men between the ages of 50 and 74 estimated the day before the survey were higher than for other age groups, but did not seem excessive (Table 3.7). It appears that proteins and lipids were the main factors in the higher energy intakes of men in this age group (Table 3.8).

Among women, the situation was different. For one thing, energy intakes were lower in women over the age of 50 (Table 3.7). For another, women in the 35-49 age group tended to have higher median intakes in proteins and lipids than women in other age groups.

Although median energy intakes were lower in women aged 50 and over, their diet was comparable to that of other women in terms of nutritional density. In fact, it was the younger women's diet which was less concentrated in proteins and lipids. In both men and women, the concentration in vitamin C and dietary fibre diminished with age.

**• Differences according to coast and sector of residence**

The day before the survey, median intakes in energy, proteins and lipids varied little from one coast of residence to the other (Hudson and Ungava) (Appendix 5, Table A-3.1). Median intakes in carbohydrates were, however, slightly higher on the Ungava coast.

As for the sector of residence (division based on ease of access and living conditions), residents of sector A tended to have slightly higher median intakes in energy, proteins and lipids than residents of sector B (Appendix 5, Table A-3.2).

(1) For simplicity's sake, caffeine is included in this section even though it is not a macronutrient.

- **Differences according to level of education**

Median energy intakes were found to be higher among the better-educated Inuit, apparently because of their higher intakes in carbohydrates (Appendix 5, Table A-3.3). However, these results must be interpreted with caution since the level of education remains unknown in 17% of cases and few individuals had completed high school (35). In any event, the energy and nutrient intakes of the Inuit for whom the level of education is unknown were similar to those of other individuals (data not presented).

## 3.4.2 Micronutrients

- **Differences according to sex**

In keeping with the trends observed for macronutrients, median intakes in **micronutrients** were, for the most part, higher in men than in women the day before the survey. It is interesting to note, however, that the women's diet was higher in vitamin A, vitamin $B_{12}$ and carotene in the 18-34 age group, higher in vitamin C in the 35-49 age group and higher in carotene in the 50-74 age group than the men's diet in the same age groups (Table 3.8).

- **Differences according to age**

In both men and women, median intakes in carotene and vitamin C (estimated the day before the survey) gradually diminished with age. Lower median intakes in micronutrients were apparent in certain age groups, notably for iron in women between the ages of 18 and 34, and for zinc, vitamin A and total vitamin D in men and women between the ages of 50 and 74.

Nutritional density findings (Table 3.8) suggest that the diet's concentration in calcium (among men) and vitamin C (in both sexes) diminished with age. In contrast, density in iron, thiamine, riboflavin, niacin, natural vitamin D and pantothenic acid rose with age. This trend was more marked in men, however.

- **Differences according to coast and sector of residence**

The day before the survey, median intakes in nutrients were similar on both coasts (Hudson and Ungava), with the exception of intakes in carotene, vitamin C and folic acid, which were slightly higher on the Ungava coast, reflecting greater consumption of fruit and vegetables, as mentioned earlier (Appendix 5, Table A-3.1).

It was also found that individuals in sector A tended to have slightly higher median intakes for most nutrients than residents of sector B. Median intakes in potassium, sodium, vitamin C and carotene in sector A were particularly high when compared with those in sector B (Appendix 5, Table A-3.2).

- **Differences according to level of education**

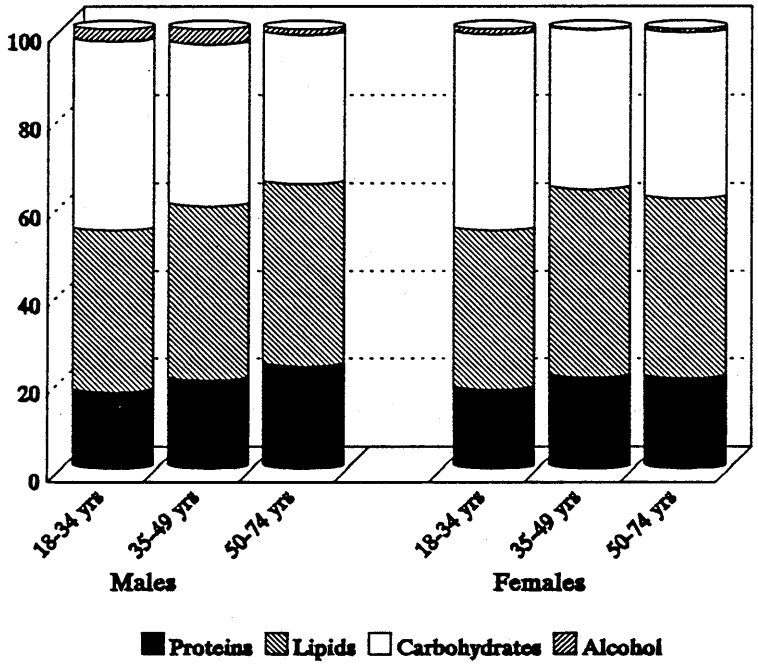
Median intakes in vitamin C and carotene observed the day before the survey increased gradually with the level of education (Appendix 5, Table A.3.3). In addition, the Inuit with a post-secondary level of education had higher median intakes of calcium, potassium, total vitamin D and vitamin A than those who had left school earlier. Finally, median intakes of vitamin $B_{12}$ were higher among less educated individuals, suggesting higher consumption of foods from animal sources.

## 3.5 SOURCES OF ENERGY

Graph 3.10 shows the percentage of energy intake from proteins, carbohydrates, lipids and alcohol, while Table 3.9 shows the energy contribution of saturated, monounsaturated and polyunsaturated fatty acids.

**GRAPH 3.10**

**Proportion of energy intake from macronutrients the day before the survey, according to age and sex [Inuit, 1992]**



The day before the survey, the mean contribution of carbohydrates (42%) to total energy in the Inuit population under study was somewhat lower than that reported (47%) in the survey of the Québec population (SQN, 1990) and tended to be higher among younger than older Inuit (Graph 3.10). On the other hand, the percentage of energy from proteins (20%) and lipids (37%) was, on average, higher in the Inuit population than in the Québec population (16% and 34% for proteins and lipids respectively). The survey conducted by Lawn and Langner (1994) in the N.W.T. revealed protein intakes ranging from 17 to 22% depending on the community, while lipid supplied from 29 to 34% of energy in the Santé Québec health survey (SQN, 1990). The average contribution of proteins to energy rose gradually with age in men (from 18 to 25%), a trend that was not found in women.

Even though the average contribution of lipids to energy intake noted the day before the survey was higher among the Inuit, the contribution of saturated fatty acids (Table 3.9) tended to be slightly lower among them (12% on average) than among southern Quebecers (13%). Conversely, monounsaturated fatty acids supplied, on average, more energy among the Inuit (16%) than among Quebecers (13%), while the contribution of polyunsaturated fatty acids was comparable in both populations (5%). Thus, according to the data collected for this study, the Inuit diet was richer in lipids than that of southern Quebecers, although less concentrated, on average, in saturated fatty acids and richer in monounsaturated fatty acids. Linoleic acid (n-6) and particularly linolenic acid (n-3) are polyunsaturated fatty acids that often attract particular attention in the Inuit diet, mainly because of their role in preventing cardiovascular disease. The day before the survey, median intakes in n-3 among the Inuit population varied between 1.3 and 2.7 g depending on age and sex; they rose gradually with age among men and were higher in women aged 35 and over than among the younger ones. Median intakes in n-6 were higher than in n-3, and varied between 5.0 and 8.3 g on the day covered by the study.

## TABLE 3.9

**Proportion of energy intake supplied by fatty acids the day before the survey, according to age and sex [Inuit, 1992]**

| FATTY ACIDS/ ENERGY | MEN | | | WOMEN | | | TOTAL |
|---|---|---|---|---|---|---|---|
| AGE | 18-34 | 35-49 | 50-74 | 18-34 | 35-49 | 50-74 | |
| N | 92 | 64 | 41 | 103 | 70 | 63 | 433 |
| SATURATED FATTY ACIDS | 11.3 | 11.4 | 11.4 | 11.1 | 11.3 | 12.1 | 11.3 |
| POLYUNSAT. FATTY ACIDS | 4.8 | 5.3 | 5.1 | 5.0 | 5.0 | 5.3 | 5.0 |
| MONOUNSAT. FATTY ACIDS | 15.7 | 16.3 | 17.2 | 15.6 | 17.9 | 17.0 | 16.2 |

According to Health and Welfare Canada (SBESC, 1990), the ratio of n-6 : n-3 fatty acids should be between 4 : 1 and 10 : 1 to ensure, among other things, a degree of protection against cardiovascular disease. In the Inuit population studied, this ratio (based on median intakes), varied between 3 : 1 and 5 : 1. However, as pointed out by Kuhnlein, Kubow and Soueida (1991), since the benefits of the Inuit diet on health, based on traditional foods, seems to be well established, the slightly lower ratio (n-6 : n-3) observed among the Inuit may be offset by the fact that their type of diet is lower in saturated fatty acids and higher in monounsaturated fatty acids than the Western-type diet.

The contribution of alcohol to the energy intake of the Inuit on the day covered by the study was slightly higher in men than in women, although marginal for both. However, a single 24-hour Recall probably does not reflect the usual consumption of alcohol among the Inuit, as indicated by Nobmann *et al.* (1992), who observed that consumption of alcohol among Natives may have been underestimated because the survey days did not coincide with episodes of "binge drinking," a frequent occurrence among Native populations.

Lipids and proteins made a greater contribution, on average, to energy intakes on the Hudson coast than on the Ungava coast (Appendix 5, Graph A-3.1). The difference in lipid levels may stem from a higher contribution of monounsaturated fatty acids to energy intakes along the Hudson coast (17%) than in the Ungava region (15%). However, the contribution of carbohydrates to energy was higher in the Ungava region than along the Hudson.

An analysis of the findings by sector of residence (Appendix 5, Graph A-3.1) shows few differences, except that in sector A, lipids contributed slightly more and carbohydrates slightly less to energy than in sector B.

As for the level of education, the main difference had to do with the contribution of carbohydrates to energy, which appeared lower in less educated individuals (40%) than in more educated ones (about 45%). On the other hand, alcohol supplied more of the energy intake among individuals who had completed high school (2%) than among those who had not (less than 1%).

- **Breakdown of individuals according to their consumption of lipids**

Table 3.10 indicates that the day before the survey, nearly a third of individuals below the age of 35 and about a quarter of individuals over that age had lipid intakes supplying less than 30% of their energy. On the other hand, 34% of the Inuit surveyed had lipid intakes supplying more than 40% of energy, and about 23% of individuals derived more than 45% of their energy from lipids. It appears that, in the 50-to-74 age group, more women than men had lipid intakes supplying over 40% of energy.

## TABLE 3.10

**Breakdown of individuals according to their consumption of total lipids the day before the survey, according to age and sex (%) [Inuit, 1992]**

| % LIPIDS | MEN | | | WOMEN | | | TOTAL |
|---|---|---|---|---|---|---|---|
| AGE | 18-34 | 35-49 | 50-74 | 18-34 | 35-49 | 50-74 | |
| N | 92 | 64 | 41 | 103 | 70 | 63 | 433 |
| < 30 | 33.7 | 23.3 | 24.9 | 31.8 | 24.1 | 27.2 | 29.4 |
| 30 - 35 | 16.1 | 19.4 | 15.3 | 25.4 | 14.9 | 21.1 | 19.5 |
| 36 - 40 | 17.3 | 11.8 | 26.4 | 19.4 | 16.0 | 6.8 | 16.8 |
| 41 - 50 | 19.6 | 25.5 | 16.7 | 8.9 | 22.5 | 27.1 | 18.0 |
| > 50 | 13.3 | 20.0 | 16.7 | 14.4 | 22.5 | 17.9 | 16.2 |

Although half of the Inuit surveyed reported deriving less than 11% of their energy from saturated fatty acids, 21% of them had intakes higher than 15% (Table 3.11). Among southern Quebecers, 12% were found to derive more than 15% of their energy from saturated fatty acids (SQN, 1990).

## TABLE 3.11

**Breakdown of individuals according to their consumption of saturated fatty acids the day before the survey, according to age and sex (%) [Inuit, 1992]**

| % SATURATED FATTY ACIDS | MEN | | | WOMEN | | | TOTAL |
|---|---|---|---|---|---|---|---|
| AGE | 18-34 | 35-49 | 50-74 | 18-34 | 35-49 | 50-74 | |
| N | 92 | 64 | 41 | 103 | 70 | 63 | 433 |
| < 11 | 48.0 | 51.2 | 43.7 | 53.2 | 54.4 | 51.4 | 50.6 |
| 11 - 15 | 29.2 | 26.1 | 35.7 | 28.2 | 25.1 | 23.4 | 28.1 |
| > 15 | 22.8 | 22.7 | 20.6 | 18.6 | 20.4 | 25.2 | 21.3 |

More than half the Inuit had intakes in polyunsaturated fatty acids supplying less than 5% of energy, with a higher proportion of men than women in this category (Table 3.12). However, none of the women over the age of 35 had intakes in polyunsaturated fatty acids supplying more than 11% of energy, compared with 3% of men between the ages of 35 and 49 and 2% between the ages of 50 and 74.

**TABLE 3.12**

**Breakdown of individuals according to their consumption of polyunsaturated fatty acids the day before the survey, according to age and sex (%) [Inuit, 1992]**

| % POLYUNSAT. FATTY ACIDS | MEN | | | WOMEN | | | TOTAL |
|---|---|---|---|---|---|---|---|
| AGE | 18-34 | 35-49 | 50-74 | 18-34 | 35-49 | 50-74 | |
| N | 92 | 64 | 41 | 103 | 70 | 63 | 433 |
| < 5 | 62.9 | 51.2 | 56.5 | 51.9 | 48.7 | 45.5 | 54.5 |
| 5 - 11 | 32.7 | 45.7 | 41.4 | 47.3 | 51.3 | 54.5 | 43.4 |
| > 11 | 4.4 | 3.1 | 2.1 | 0.8 | 0.0 | 0.0 | 2.1 |

The contribution of lipids to energy varied with the coast of residence. A higher proportion of Ungava (58%) than Hudson (42%) residents had lipid intakes contributing less than 35% of energy. Conversely, the percentage of individuals with lipid intakes supplying more than 45% of energy was higher in the Hudson region (30% vs. 14% in Ungava). Other trend: a higher proportion of Hudson than Ungava residents showed intakes in saturated fatty acids supplying more than 15% of energy and intakes in polyunsaturated fatty acids supplying more than 5% of energy.

## 3.6 CONTRIBUTION OF FOODS TO NUTRIENTS

### 3.6.1 Energy, macronutrients, dietary fibre and caffeine

- **Energy**

Median energy intakes among male Inuit on the day before the survey (between 1,958 and 2,507 kcal, depending on the age group) were slightly lower than those reported by Québec males (1,992 to 2,790 kcal), with the exception of older Inuit, whose median intakes were higher. Median intakes among Inuit women were similar to those reported by southern Québec women, even slightly higher (1,810 kcal among the Inuit vs. 1,617 in the southern population) in women between the ages of 35 and 49. As will be seen further on, sources of energy were quite different between the two populations because of the popularity and availability of traditional foods in Inuit communities.

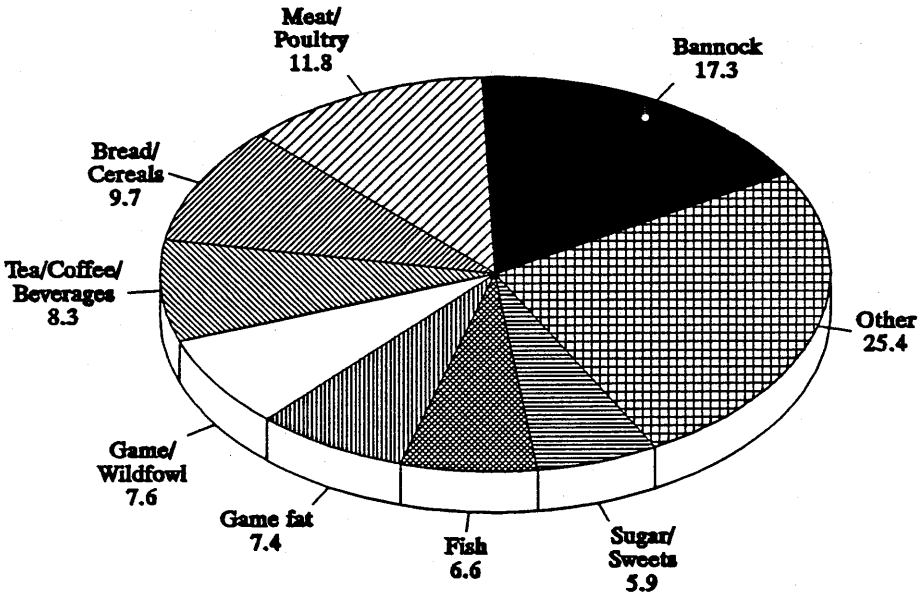
The main food sources of energy reported by the Inuit population for the day before the survey were, in decreasing order of importance: bannock, meat and poultry, bread and cereals, beverages (tea, coffee, fruit beverages and soft drinks), game and wildfowl, the fat of animals (including game), fish, sugar and sweets (Graph 3.11). For men over the age

of 50, game and fish contributed more to energy than meat and poultry (25% vs. 8%) (Graph 3.12). In addition, bread and cereals, as well as beverages, were less popular among men and women over the age of 50 than among other age groups.

As reported earlier, the contribution of alcoholic beverages to energy intake was marginal on the day under study. Beer headed the list of alcoholic beverages, while quantities of wine, liqueurs and spirits were negligible. The mean quantity of beer appeared to be higher for men in the 35-49 age group (199 g) than in all other age groups, including women (5 to 103 g).

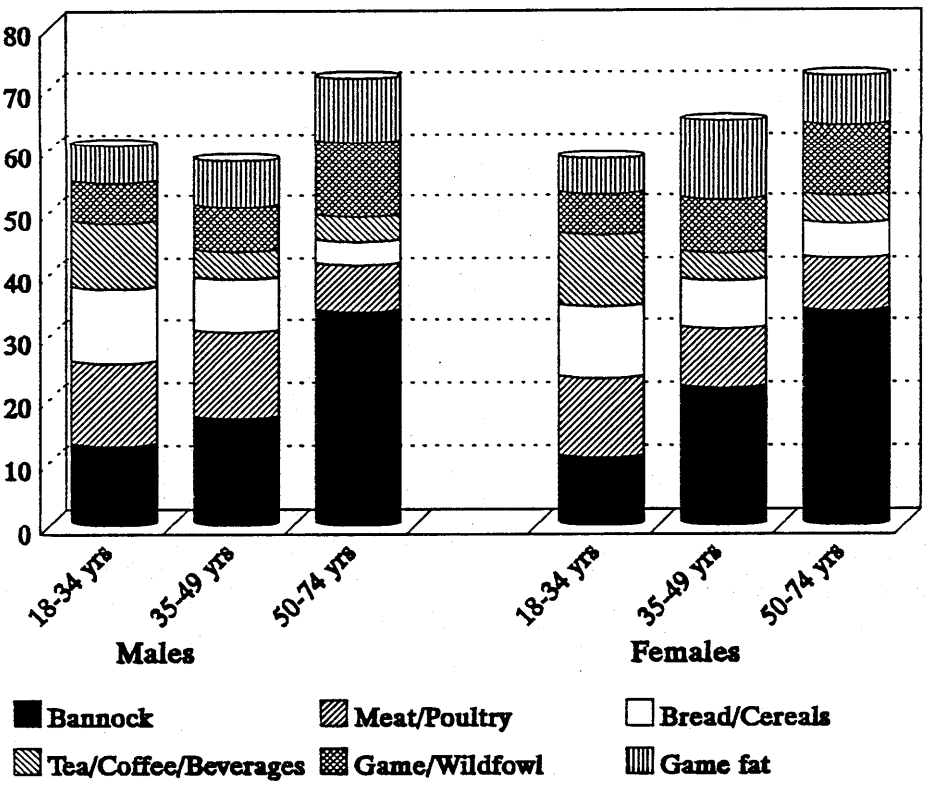
**GRAPH 3.11**

**Contribution of food groups to energy intake the day before the survey (%) [Inuit, 1992]**



## GRAPH 3.12

**Contribution of some food groups to energy intake the day before the survey, according to age and sex (%) [Inuit, 1992]**




It is interesting to note that the contribution of certain food groups to energy intake varied with the coast of residence (Appendix 5, Graph A-3.2). Inhabitants of the Hudson coast seemed to depend more on traditional foods to meet their energy needs than Ungava residents, who were more dependent on imported foods. For example, the main sources of energy among Hudson residents included bannock, meat and poultry, game and wildfowl. On the Ungava coast, the main sources of energy tended to be bread and cereals, bannock, tea, coffee and other beverages, and meat and poultry. On the Hudson coast, bread and cereals and beverages ranked sixth and seventh as sources of energy. Fish supplied about twice as much energy on the Hudson coast as on the Ungava coast. Future studies, standardized according to age, will make it possible to ascertain whether this difference between the two coasts correlates with age. The Hudson coast has a higher proportion of individuals between the ages of 50 and 74 (20%) than the Ungava coast (15%), and traditional foods are known to be particularly popular among older people. Except for beverages (tea, coffee, fruit

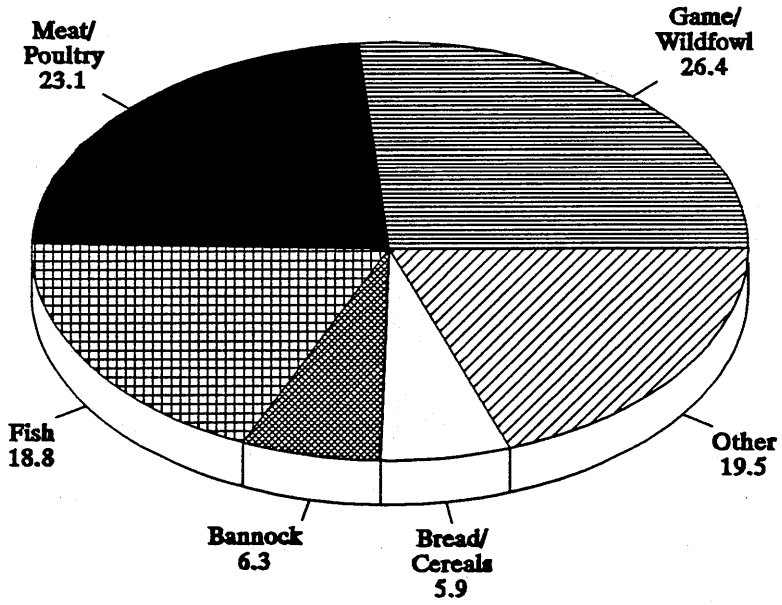
beverages and soft drinks), which were the second largest source of energy among inhabitants of sector B and thus supplied more calories (11%) than in sector A (7%), the findings show little difference between the two sectors of residence.

- **Proteins**

According to the data from the 24-hour Recall, median intakes in proteins among Inuit men between the ages of 50 and 74 (136 g) and women between the ages of 35 and 40 (92 g) were higher than in the Québec population. These differences were for the most part tied to a higher consumption of meat (including game) and fish among the Inuit, as described in section 3.1.4. The main sources of proteins in the Inuit community surveyed were, in almost equal proportions, game and wildfowl, meat and poultry, and fish (Graph 3.13). The order of importance of protein sources was practically the same for both coasts, regardless of the sector of residence or level of education. However, among individuals with a higher level of education, meat and poultry made a greater contribution to the protein intake (32%) than game (10%). Moreover, in the more accessible sector of residence (A), "meat and poultry" and game made almost equal contributions to the protein intake. Among Inuit aged 50 and over, the contribution of game and fish was clearly higher than that of meat and poultry, reflecting once again the importance of traditional foods in the Inuit diet, particularly among the older segment of the population. Bannock and "bread and cereals" also ranked among the main sources of proteins, but their contribution was relatively lower than that of meat, i.e. 6% each. Bannock was less popular among people with a higher level of education, who preferred bread and cereals.

## GRAPH 3.13

**Contribution of food groups to protein intake the day before the survey (%) [Inuit, 1992]**

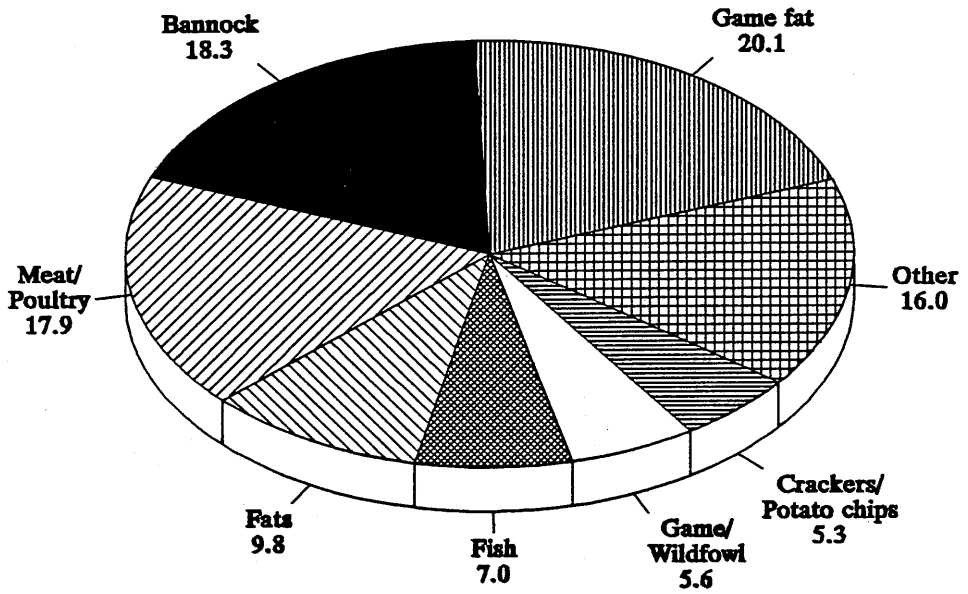



- **Lipids**

As mentioned in section 3.5, the mean contribution of total lipids to energy intake the day before the survey was considerable (37%). Consumption of lipids was relatively high for all age groups and both sexes, but especially for men and women aged 35 and over. The fat of game animals, bannock (which is made with lard), fatty fish (especially Arctic char) and pork (included in meat/poultry) together supplied nearly half (49%) the lipid intakes (Graph 3.14). Among men in the 50-74 age group and women over the age of 35, these same foods represented at least 64% of total lipid intakes. Imported fats (including butter, with 4%) represented less than 10% of the intakes. Potato chips were among the top five contributors to lipid intakes (5%).

## GRAPH 3.14

**Contribution of food groups to lipid intake the day before the survey (%) [Inuit, 1992]**




Food sources of saturated fatty acids were virtually the same as sources of total lipids, but the order of importance differed. Bannock was the main source of saturated fatty acids, supplying between 15 and 47% of intakes depending on age and sex. It was also the main source of polyunsaturated fatty acids (17%). The fat of game animals and butter contributed almost equally to the intake in saturated fatty acids (about 9%), with butter being more popular among young men. Fatty fish (> 6% of fat) was a more important source of monounsaturated and polyunsaturated fatty acids (6% and 10% of intakes, respectively) than saturated fatty acids (3%). However, among men and women aged 18 to 34, potato chips contributed more (between 15 and 20%) polyunsaturated fatty acids than fatty fish.

Median cholesterol intakes among the Inuit the day before the survey ranged from 213 to 459 mg, depending on the age group and sex, while intakes for the southern Québec population were between 162 and 332 mg. Inuit men over the age of 50 had particularly high median intakes (459 mg), especially when compared with those estimated for Quebecers of the same age (approximately 280 mg). The prevalent consumption of game and fish rich in fat may explain these high intakes. Among young Inuit between the ages of 18 and 34, who had the lowest median intakes (even lower than Quebecers of the same age), eggs supplied at least one quarter of the cholesterol intakes. However, since eggs were not eaten on a daily

basis and because there is a wide variation in the consumption of game and fish, cholesterol intakes could vary considerably from one day to the next, and it is therefore difficult to draw conclusions from the cholesterol intakes estimated during the survey. Basiotis *et al.* (1987) estimated that it would take a survey spanning 13 to 15 days to obtain a valid measurement of the mean cholesterol intake for a group of individuals.

The main sources of lipids observed in the surveys are probably the best indicators of differences between the regions (Appendix 5, Graph A-3.3). For example, on the Ungava coast, fats such as butter, margarine and oils contributed on average 15% (16.2 g) of lipids against 6% (9.2 g) on the Hudson coast. Among residents of the Hudson region, bannock and game fat accounted for a comparable lipid contribution (about 20%), while on the Ungava coast, game fat was a bigger contributing factor (20%) than bannock (13%).

Be that as it may, the contribution of various foods to lipids varied little between sectors of residence, with the exception of game fat, which was a greater factor in sector B (25%) than in sector A (18%) (Appendix 5, Graph A-3.3).

The level of education apparently had some effect on the type of fat consumed. Individuals with only a primary school education used less butter, margarine and oils than those with a secondary or post-secondary education (7% of intakes vs. 12 and 14% respectively) (Appendix 5, Graph A-3.4). Bannock was the primary source of lipids (27%) among people with a low level of education. In the better-educated individuals, pastries were consumed in sufficient quantity to rank among the four main sources of lipids (7%).

The differences observed in sources of lipids depending on the coast of residence and level of education also apply to sources of saturated fatty acids. For example, on the Hudson coast, bannock supplied 21% of saturated fatty acids vs. 13% on the Ungava coast.

Sources of polyunsaturated fatty acids were more or less the same regardless of the coast, sector of residence or level of education, except for margarine and oils, which accounted for higher intakes among better-educated individuals (13% and 19% for secondary and post-secondary graduates) than among those who had less education (9%).

As mentioned in section 3.5, linoleic acid (n-6) and especially linolenic acid (n-3) are nutritionally important because of their role in preventing cardiovascular disease. Arctic char was the main supplier of n-3 fatty acids (42% of intakes), followed by the fat of domestic and wild animals (18%) and butter, margarine and oils (13%). Among men between the ages of 18 and 34, animal fat contributed as much to the n-3 intakes as fish (about 25%), while women in the same age group derived more of these acids from commercial products such as butter, margarine and oils than from animal fat (15% vs. 8%).

Median intakes in n-6 fatty acids were higher than in n-3. Bannock (23%), meat and poultry (19%) and fats (13%) were the main sources. Among men aged 18 to 49 and women aged 18 to 34, meat and poultry ranked on a par with bannock.

- **Carbohydrates**

The day before the survey, median intakes in carbohydrates among the Inuit surveyed were lower than in the rest of Québec. This difference was more marked in men under the age of 50. The Inuit are large consumers of bannock, a considerable source of carbohydrates. In fact, bannock, beverages (including soft drinks and fruit beverages), bread/cereals, and sugar/sweets were the four main sources of carbohydrates in the Inuit diet (Graph 3.15). As is the case for energy, bannock contributed more to carbohydrate intakes than bread/cereals among people over the age of 50 while the reverse was true for younger people. Among the latter, the contribution of beverages was quite high (about 26% of carbohydrates). Nonetheless, the contribution of carbohydrates to the Inuit's energy intake (42%) is still lower than in the rest of the Québec population (47%).

The above-mentioned food categories were among the four main sources of carbohydrates regardless of the coast, sector or level of education, except for bannock, which ranked only seventh (5%) and vegetables, which ranked fourth (11%), among the better educated. In those with a lower level of education, bannock was clearly the main source of carbohydrates. Finally, soft drinks and fruit beverages were the main source of carbohydrates on the Ungava coast and in sector B, thus confirming the importance of these foods as sources of energy in these regions.

- **Dietary fibre**

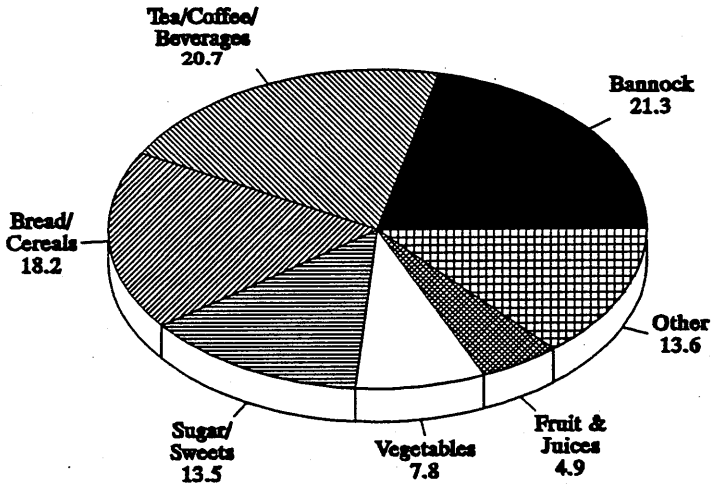
In addition to regulating digestive and intestinal functions, dietary fibre may prevent cardiovascular ailments and some types of cancer (SBESC, 1990). The day before the survey, the Inuit had consumed little in the way of dietary fibre, and their median intakes were about twice as low as in the rest of Québec. Bannock, vegetables and bread/cereals were the main sources of fibre and together supplied about 75% of the fibre intakes (Graphs 3.15A and 3.15B). Fruit and fruit juices supplied 9% of dietary fibre. The contribution of various foods to fibre intakes varied with age (Graph 3.16). Vegetables were less popular among people over the age of 50 and supplied only between 13 and 17% of fibre intakes, compared with 22-28% in people below that age. On the other hand, vegetables seemed to make a greater contribution to fibre intakes than bannock on the Ungava coast (28% vs. 18%), in sector A (28% vs. 24%) and among individuals with a secondary (28% vs. 17%) and post-secondary (34% vs. 4%) level of education.

Legumes, which are an important source of fibre, were seldom eaten by the Inuit. Baked beans (homemade or canned) were the only legumes rich in fibre eaten the day before the survey.

## GRAPH 3.15A

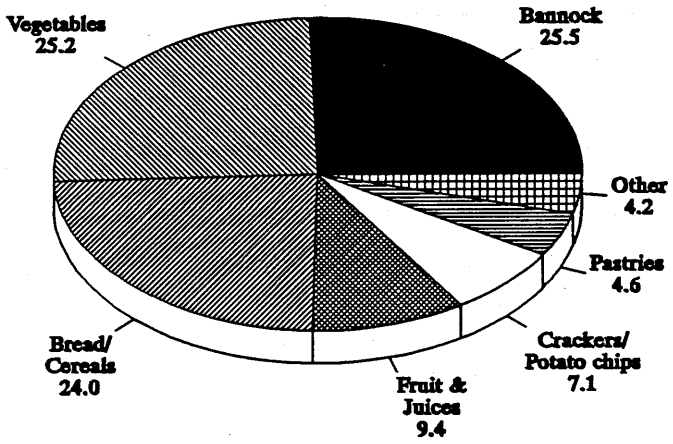
**Contribution of food groups to carbohydrate intakes and dietary fibre the day before the survey (%) [Inuit, 1992]**

### Carbohydrates



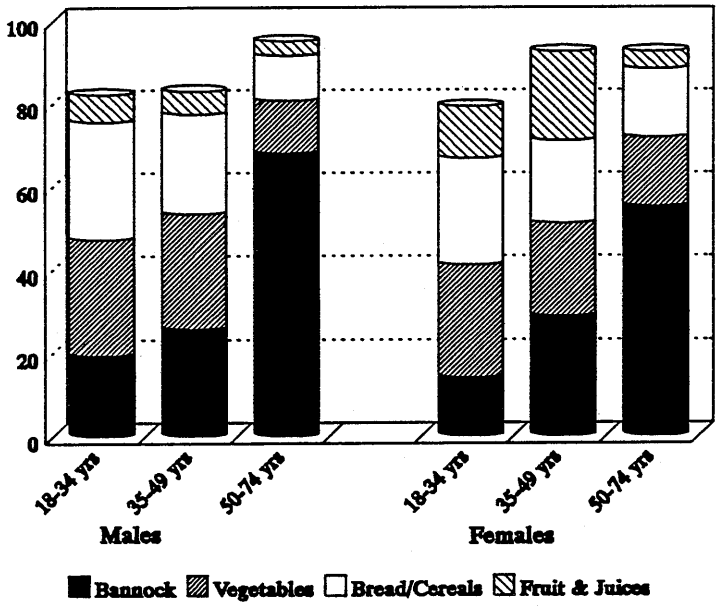

## GRAPH 3.15B

### Dietary fibre



## GRAPH 3.16

**Contribution of some food groups to dietary fibre intakes the day before the survey, according to age and sex (%) [Inuit, 1992]**




- **Caffeine**

Some harmful effects on health have been observed due to a high intake of caffeine. Thus, it is recommended that caffeine intake be limited to the equivalent of four cups of coffee a day (SBESC, 1990). The day before the survey, the median intake in caffeine found among Inuit men and women of all ages was lower than the recommended upper limits (about 320 mg or the equivalent of four cups of coffee a day). Tea supplied more than half the caffeine intake (54%), while coffee supplied on average 38%. Coffee was not very popular among Inuit over the age of 50, who preferred tea. Regular (i.e. non-diet) soft drinks supplied on average 7% of the intake. Finally, the largest quantity of soft drinks was consumed by young people between the ages of 18 and 34, supplying between 11 and 13% of their total caffeine intake.

No appreciable difference was noted in median caffeine intakes in terms of level of education, coast or sector of residence.

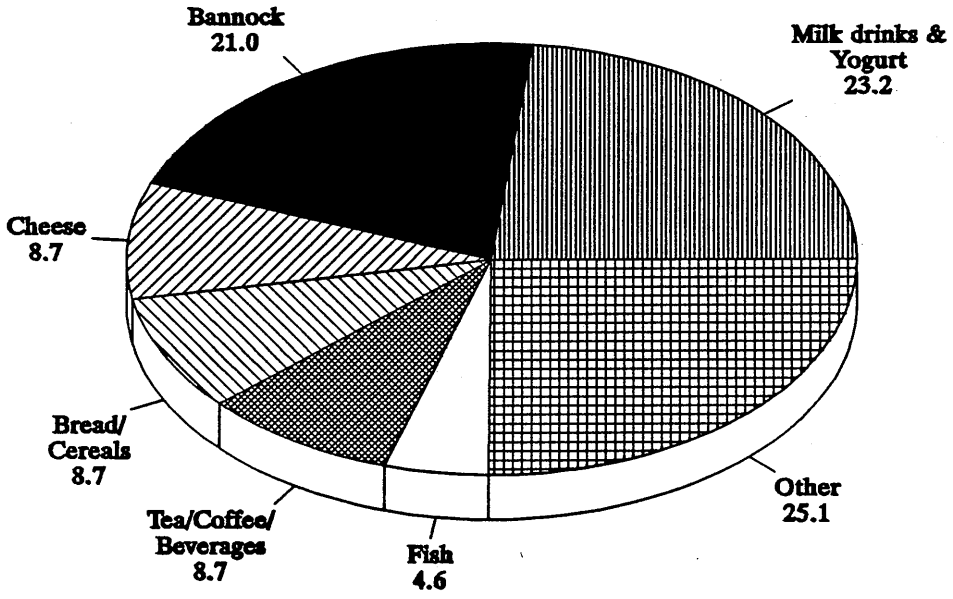
## 3.6.2 Micronutrients

- **Calcium**

Calcium is essential for the development of bones and teeth, and plays an active part in various metabolic processes such as transmission of nerve signals, blood coagulation, contraction of muscles and hormonal functions (SBESC, 1990). On the whole, median calcium intake on the day of the survey was low, i.e. half of that estimated for southern Québec. Particularly low among women over the age of 50 (265 mg), calcium intake was lower than recommended for all age groups and both sexes. The main sources of calcium in the population surveyed were "milk drinks and yogurt" and bannock (Graph 3.17). Cheese, along with bread and cereals and beverages (tea, coffee, soft drinks and fruit beverages), each supplied on average, 9% of the calcium intake. As shown in Graph 3.18, bannock was an appreciable source of calcium for people between the ages of 50 and 74 (53%), while milk drinks and yogurt were a more important source for people between the ages of 18 and 34 (31%).

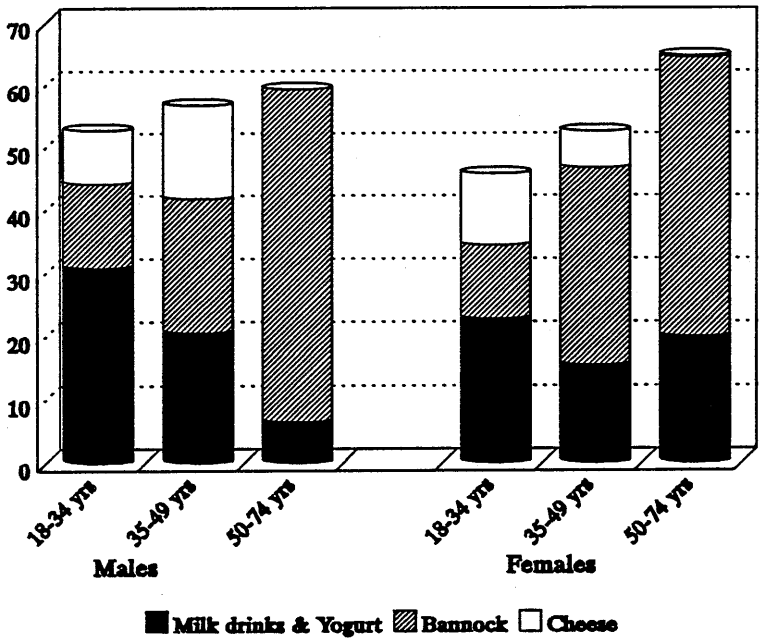
**GRAPH 3.17**

**Contribution of food groups to calcium intake the day before the survey (%) [Inuit, 1992]**



## GRAPH 3.18

**Contribution of some food groups to calcium intake the day before the survey, according to age and sex (%) [Inuit, 1992]**




Median calcium intakes were similar on both coasts (Ungava and Hudson) and for both sectors of residence (A and B). However, they were higher among individuals with a post-secondary education (657 mg) than among people with a lower level of education (about 330 mg). Milk drinks and yogurt contributed nearly 30% of the calcium intake among the better-educated population, compared with 17% among individuals with a primary school education (Appendix 5, Graph A-3.6). Among the latter, bannock supplied on average 33% of the calcium intake. The contribution of cheese was twice as high among individuals with a secondary or post-secondary education (about 13%) as among individuals with a primary level (5%).

- **Iron**

Among other things, iron plays a role in the circulation and storage of oxygen. A severe iron deficiency is characterized by anemia and may be associated with a seriously diminished ability to work and a reduction in productivity. In children, this may translate into a reduced attention span and learning disabilities (SBESC, 1990). In the population surveyed, median intakes in iron the day before the survey seemed to meet the Canadian recommendations, varying between 10.1 and 13.7 mg in women and 12.8 and 15.8 mg in men. Game and wildfowl, which are traditional foods among the Inuit, were without doubt the main source of iron (Graphs 3.19A and 3.19B), supplying between 54% and 61% of the intakes in women and men over the age of 50. Bannock ranked second among sources of iron for individuals aged 35 and over, while bread and cereals, especially white bread, were a more important factor among people between the ages of 18 and 34. Game and bannock each supplied on average more than half (57%) of the Inuit's iron intake. Fish and seafood, for their part, made an appreciable contribution to the Inuit's iron intake (6% on average) because of the quantities consumed.

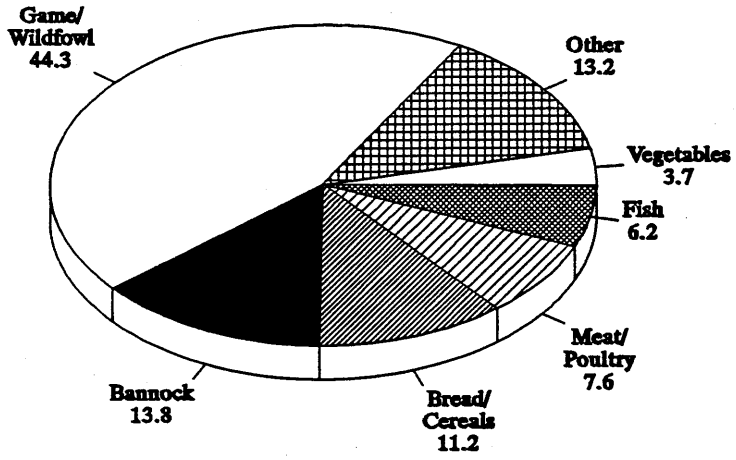
Food sources of iron were similar on both coasts (Hudson and Ungava), except for the fact that "bread and cereals" made more significant contributions in the Ungava region (15%) than along Hudson Bay (9%). Residents of the more accessible sector (A) were slightly more dependent on meat and poultry as a source of iron than those of the more remote sector (B), but in both sectors, particularly sector B, game and wildfowl were undeniably the main source of iron.

Individuals with less education were more dependent on game (which supplied on average 51% of their iron intakes) than more educated individuals (26 to 36%).

## GRAPH 3.19A

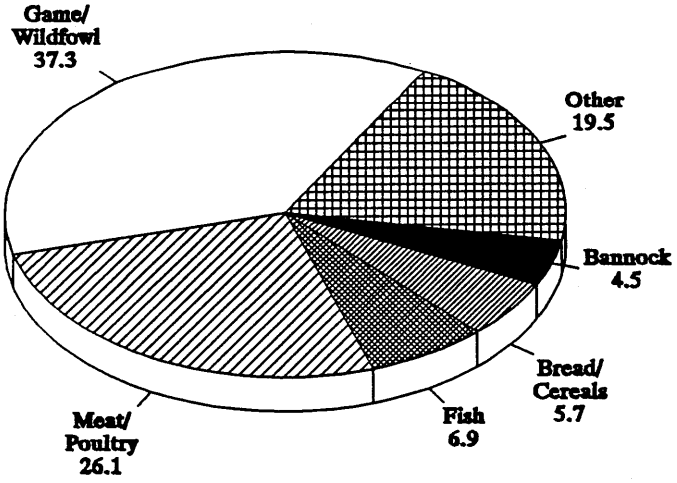
**Contribution of food groups to iron and zinc intakes the day before the survey (%) [Inuit, 1992]**

### Iron




## GRAPH 3.19B

### Zinc



- **Zinc**

Zinc deficiency can be responsible for retarded growth, inadequate response of the immune system, lack of appetite and impaired sense of taste (SBESC, 1990). Median zinc intakes the day before the survey seemed rather low, varying between 6.9 and 9.7 mg in men and between 6.2 and 8.2 mg in women. The lowest intakes were found in individuals between the ages of 50 and 74. "Game and wildfowl" and "meat and poultry" were the two main sources of zinc (Graph 3.19) regardless of sex, age, coast or sector of residence. In the "meat and poultry" group, chicken and ground beef were the main sources of zinc (particularly among people aged 18 to 34). In individuals with a higher level of education, "meat and poultry" were the main sources of zinc (37%), while game was far behind (15%). The contribution of fish and seafood to zinc intake varied between 5 and 10% depending on the coast, sector of residence and level of education. Overall, bread and cereals contributed marginally to zinc intakes among the Inuit surveyed (6%).

- **Vitamin A**

Vitamin A is essential for healthy epithelial tissues, bone growth, eyesight and reproduction (SBESC, 1990). Median intakes in vitamin A estimated for the day before the survey were low (about twice as low as those estimated for southern Québec), particularly for men and women over the age of 50. However, it is generally recognized that since vitamin A intakes vary widely from one day to the next, an estimate based on a single day of observation is hardly representative of an individual's customary intake. For this reason, any reference to vitamin A intakes based on the 24-hour Recall must be viewed with reservations.

Game fat, vegetables, and meat and poultry were the three main sources of vitamin A in the Inuit population on the day covered by the survey (Graph 3.20). In older men and in women between the ages of 35 and 49, the contribution of game fat to vitamin A intakes was predominant (nearly half of the intakes), while in men between the ages of 35 and 49 and in younger women vegetables were a more important source (Graph 3.21). In one Baffin Island Inuit community, the fat of narwhal and ringed seal accounted for more than a third of the recommended nutritional intakes for women between the ages of 19 and 40 (Kinloch, Kuhnlein and Muir, 1992).

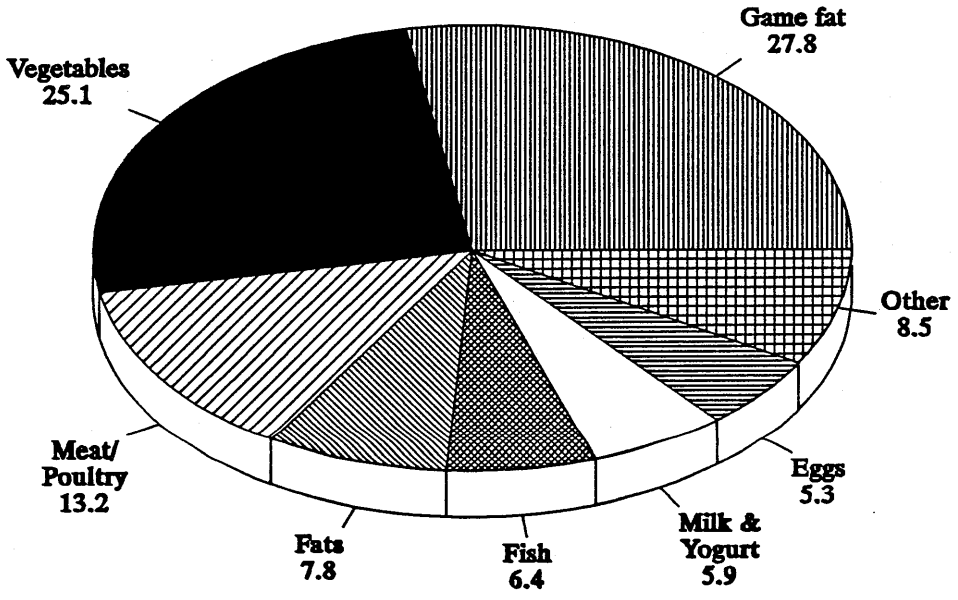
Low consumption of milk and margarine, which contain added vitamin A, and particularly the limited consumption of vegetables, seem to explain for the most part the low vitamin A intakes observed. In the Québec population, vegetables supplied on average 53% of the vitamin A intakes, compared with 25% among the Inuit. Dairy products and fats such as butter and margarine supplied respectively 9% and 8% of vitamin A (vs. 16 and 10% for southern Québec). Finally, organ meats, which are an excellent source of vitamin A, were seldom eaten by the Inuit. Ringed seal liver, for instance, was eaten only by men in the 35-49 age group and by younger women, contributing 12% and 29% respectively of their intakes in vitamin A on the day covered by the survey. It is possible that liver is seldom eaten

because of the publicity surrounding the potential risk of contamination of liver (that of seal in particular) by environmental pollutants.

These findings suggest a low contribution of dairy products and imported fats to vitamin A intakes among the Inuit of Nunavik. Somewhat different findings were obtained by Verdier *et al.* (1987), who noted that the main sources of vitamin A in an Inuit community of Arctic Bay (N.W.T.) came from commercial foods (milk, butter, margarine, enriched lard, eggs), despite the importance of traditional foods in that community's diet. On the other hand, Lawn and Langner (1994) reported that traditional foods (game meat and fish) and vegetables were the main sources of vitamin A (accounting for more than 50% of intakes) in the majority of the Inuit communities surveyed. The significant contribution of game fat and imported meats to vitamin A observed in the present survey was not apparent in their study.

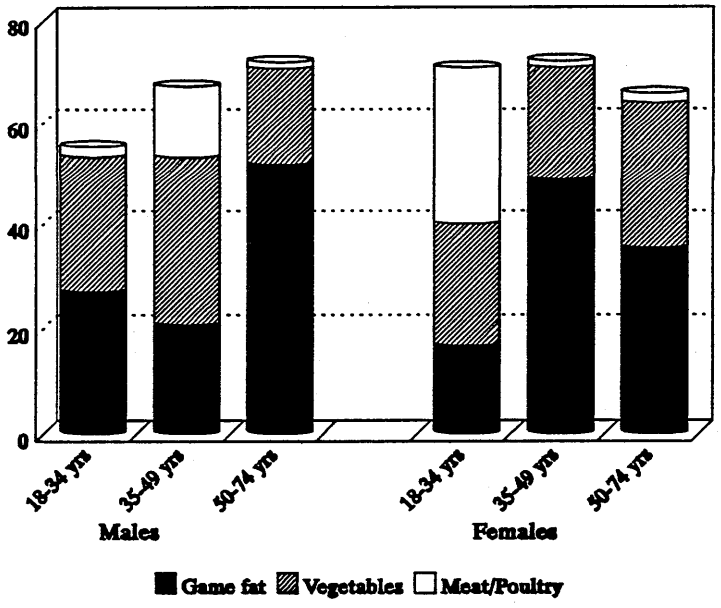
**GRAPH 3.20**

**Contribution of food groups to vitamin A intake the day before the survey (%) [Inuit, 1992]**



## GRAPH 3.21

**Contribution of some food groups to vitamin A intake the day before the survey, according to age and sex (%) [Inuit, 1992]**




In the Inuit population surveyed, vitamin A was found mainly in the form of ß-carotene in vegetables, which contributed on average more than a quarter (28%) of vitamin A intakes the day before the survey. The best sources of carotene were carrots (56% of carotene intakes or 16% of vitamin A intakes). Carrots were practically the only source of carotene for individuals aged 50 to 74, supplying more than 70% of their intake. The popularity of carrots is also evident in the findings of the Frequency Questionnaire, with more than two thirds of Inuit women reporting they had eaten fresh carrots the month preceding the survey. Tomatoes contributed about 5% of intake, while broccoli, cabbage, green peas, squash and leafy vegetables, which are seldom eaten by the Inuit, contributed little to carotene intake (between 4 and 5% overall). The low consumption of these vitamin-rich vegetables is probably due to the fact that they are not readily available in the Nunavik region. Fruit rich in carotene such as cantaloupe and peaches contributed marginally (less than 1%) to carotene intakes. As for fruit juices, they supplied on average 4.4 mg of carotene (2% of the Inuit's intake during the day preceding the survey).

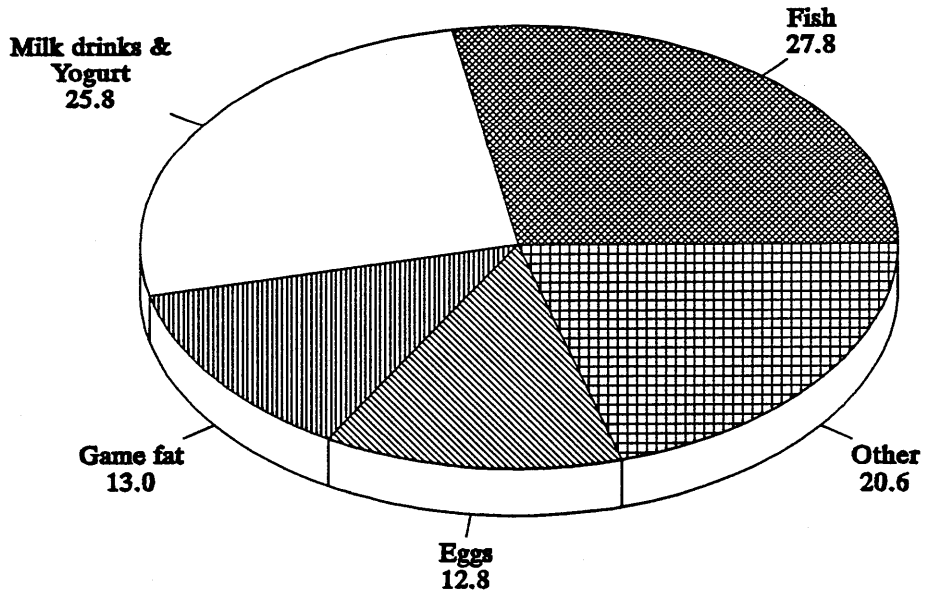
Independently of the coastal region, sector of residence or level of education, game was an undeniable source of vitamin A, varying from 18 to 38% (Appendix 5, Graphs A-3.7 and A-3.8). However, vegetables tended to outrank game fat as a source of vitamin A among the residents of the Ungava region and sector A, particularly in the case of individuals with a post-secondary education. If we refer to Section 3.1.2.3, the vegetables consumed seemed more varied in Ungava and sector A, particularly among the better-educated individuals. In addition, among the latter, fats (butter, margarine and oil), milk drinks and yogurt, eggs and fish each supplied on average more vitamin A (between 4 and 9%) than meat and poultry (1.4%).

- **Vitamin D**

Vitamin D helps metabolize calcium and phosphorus, which are essential for bone mineralization and other cell processes (SBESC, 1990). Median vitamin D intakes estimated from the 24-hour Recall were particularly low among older men and women (1.2 and 1.4 $\mu$g respectively). Unlike in Southern Québec, where it is added to certain foods, vitamin D in Nunavik is found mainly in its natural state, i.e. in fish and animal fat. Despite the contribution of these foods, vitamin D intakes were low. Milk, an excellent source of vitamin D, contributed on average only one quarter of the intake, because it is seldom consumed. Fish, particularly those containing more than 6% lipids, like Arctic char, were the primary source of vitamin D among the Inuit, followed closely by milk drinks and yogurt (Graph 3.22). Among men aged 18 to 34, milk drinks and yogurt were an even greater source of vitamin D than fish. On average, fish supplied more than half (55%) of total vitamin D intakes in men between the ages of 50 and 74.

## GRAPH 3.22

**Contribution of food groups to total vitamin D intake the day before the survey (%) [Inuit, 1992]**




Residents of the Ungava Coast, as well as individuals with a secondary or post-secondary education, depended on milk to a greater extent than fish, and tended to have higher vitamin D intakes than other individuals. No significant difference was associated with the sector of residence (A or B). As well, eggs supplied at least 10% of the vitamin D intake, and butter and margarine between 8 and 13%, regardless of the region or level of education.

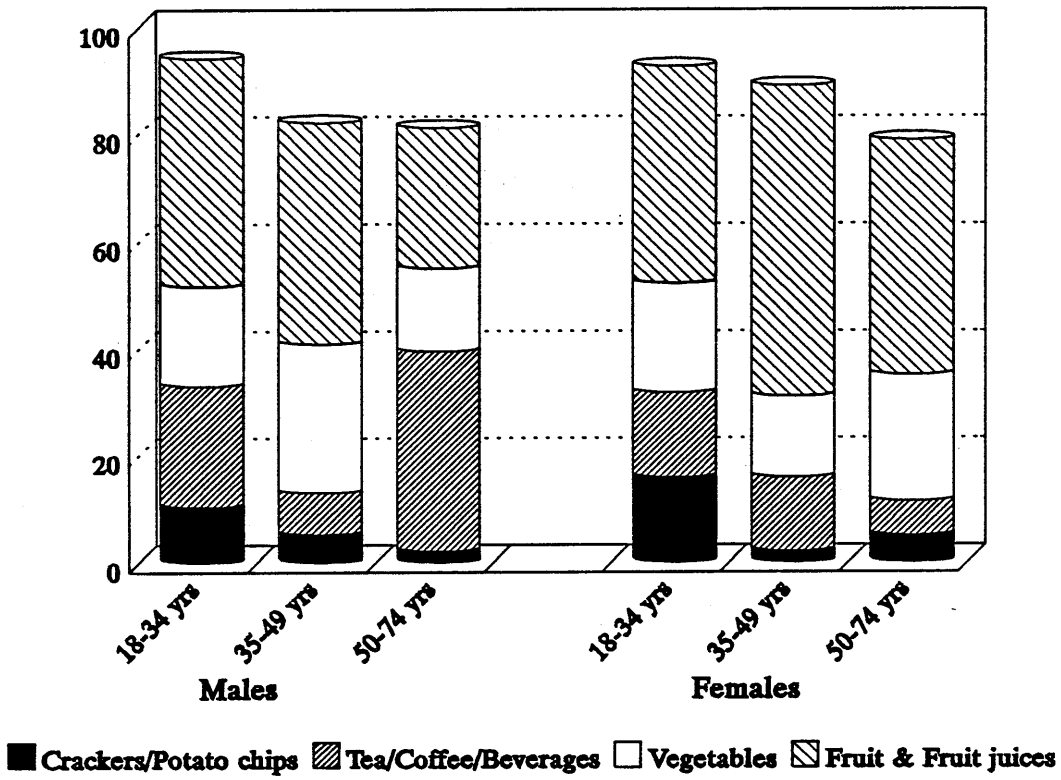
- **Vitamin C**

Vitamin C prevents scurvy, a disease characterized by degeneration of collagen-based tissues and hemorrhaging of capillary vessels. It is known that smokers have greater vitamin C needs (SBESC, 1990) than non-smokers. The median vitamin C intake on the day preceding the survey among Inuit aged 35 or over, and particularly those over the age of 50 was low, owing to the small consumption of fruit, fruit juices and vegetables. Nonetheless, fruit and fruit juices contributed, on average, 43% of the vitamin C intake, nearly 34% of which came from juice alone. Citrus fruit (orange, lemon and grapefruit) supplied on average 3.4 mg of vitamin C, or slightly over 5% of the total intake. Overall, these findings compare with those of the survey conducted among the Québec population (SQN, 1990), in which the contribution of fruit and fruit juices came to 42%. The contribution of fruit-flavoured drinks

was found to be relatively high (18%) among the Inuit; these drinks ranked as the second-largest source of vitamin C, except in men between the ages of 50 and 74, where it was the main source (37% of intake) (Graph 3.23).

**GRAPH 3.23**

**Contribution of some food groups to vitamin C intake the day before the survey, according to age and sex (%) [Inuit, 1992]**




Fruit drinks supplied nearly a third of the vitamin C intake in sector B and a quarter of it on the Ungava coast, compared with 11% for sector A and the Hudson coast. Among the better-educated Inuit, fruit drinks contributed only 6% of the intake, which compares with 4% reported for the Québec population in general.

Vegetables supplied less vitamin C among the Inuit (20%) than among Quebecers (42%). Among vegetables, potatoes (excluding potato chips), tomatoes and tomato juice were the principal sources of vitamin C. On the other hand, given their popularity, particularly among young people between the ages of 18 and 34, potato chips contributed more than 10% to the vitamin C intake, i.e. the same quantity supplied by potatoes in their boiled, roasted or fried

form. This does not mean, however, that potato chips are a good source of vitamin C. Their consumption has to be quite high to supply an appreciable quantity of vitamin C, and they are a major source of lipids. Lawn and Langner (1994) reported that 12 to 18% of vitamin C is supplied by potato chips in some of the Inuit communities in the Northwest Territories.

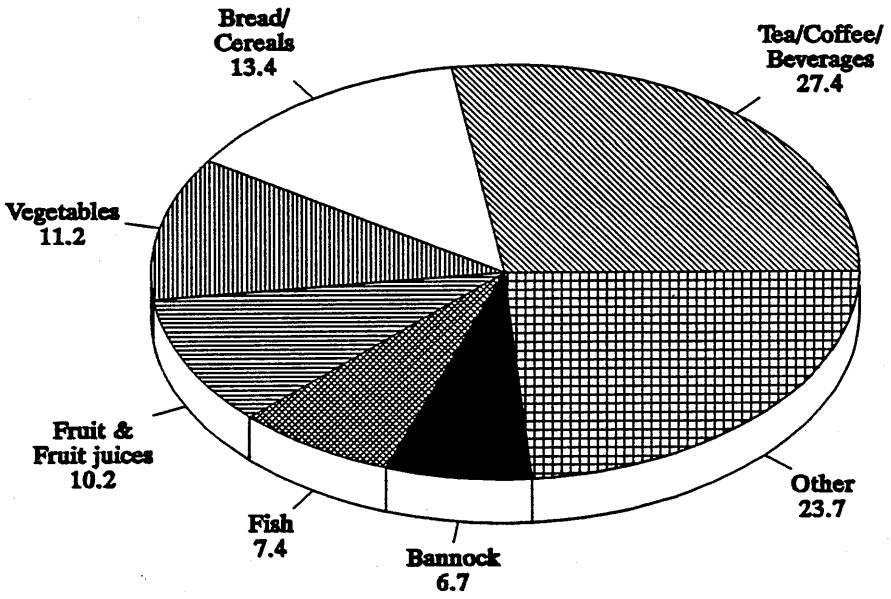
On the Hudson coast and among Inuit with a secondary level education, potato chips accounted for about 15% of vitamin C intake. In sector B, where the availability of certain imported foods is more of a problem, fruit and vegetables contributed less to the overall intake (47%) than in sector A (71%). However, because fruit drinks supplied about a third of the overall intake, the estimated quantity of vitamin C during the 24-hour Recall was about the same in both sectors.

- **Folic acid**

Folic acid is essential for normal growth, healthy tissues and normal development of the nervous system and the fetus (SBESC, 1990). As is the case with vitamin C, median intakes in folic acid among the Inuit studied was low due to scant consumption of vegetables, fruit and whole-grain cereal products. Surprisingly, tea was the main source of folic acid among the Inuit the day before the survey (Graph 3.24). Among individuals aged 50 and over, tea supplied nearly half (about 46%) of the intake. Bread, mostly the white variety, and cereals, vegetables (primarily potatoes) and fruit (especially fruit juices) supplied between 10 and 13% of the intake and were more of a contributing factor among people below the age of 50. Bannock was the second source of folic acid among Inuit over the age of 50 (about 13% of mean intake).

**GRAPH 3.24**

**Contribution of food groups to folic acid intake the day before the survey (%) [Inuit, 1992]**




Sources of folic acid were basically the same regardless of the coast and sector of residence, tea being the main source in all cases, followed by bread and vegetables. Among individuals with a higher level of education, however, vegetables and fruit were the main sources (about 20% for each group), while tea contributed only 11%. Beer supplied 7% of the folic acid intake among individuals with a higher level of education.

- **Vitamin $B_6$**

Vitamin $B_6$ is involved in the metabolism of proteins and is essential for growth (SBESC, 1990). Median intakes in vitamin $B_6$ were low among the Inuit, particularly among women. Even though the Inuit ate large quantities of meat, which is a major source of vitamin $B_6$, their diet included few whole-grain cereal products or raw fruit or vegetables, which are also good sources of vitamin $B_6$. In the Inuit population studied, "meat and poultry", "game and wildfowl" and fish (particularly those containing more that 6% fat) supplied between 16 and 23% of intakes. Inuit between the ages of 18 and 34 depended mainly on imported meat and poultry (about one quarter of the intake), while those aged 50 and over were more dependent on fish (over one third of the intake). Potato chips supplied about 5% of the intake in individuals aged 18 to 24.

There were no significant differences in sources of vitamin $B_6$ between the coasts, sectors of residence or levels of education, except for the fact that game meat made a lesser contribution (under 5%) among better-educated Inuit. However, their consumption of vegetables and fruit tended to be higher than that reported by the less educated. Beer also made a sizable contribution to vitamin $B_6$ intake: 5% among individuals with a primary level education and 8% among those with a post-secondary education. About 6% of the vitamin $B_6$ intake was supplied by beer on the Ungava coast, compared with less than 1% (0.6%) on the Hudson coast.

- **Thiamine, riboflavin and niacin**

These vitamins are involved in carbohydrate metabolism and are necessary for use of energy. They also ensure normal development of the nervous system (SBESC, 1990). The day before the survey, intakes of thiamine, riboflavin and niacin were mostly associated with consumption of meat, poultry, fish and game, all of which are major sources of these vitamins. Traditional foods played an important role, contributing between one third and one half of the intakes in all three vitamins. Bannock and bread and cereals made roughly the same contribution: about 15% of the intake in thiamine, and 7 to 8% of the intake in riboflavin and niacin. Intakes were similar on both coasts, regardless of the sector of residence or level of education.

- **Other vitamins and minerals**

Vitamin $B_{12}$, like iron, comes primarily from animal sources. The Inuit diet being rich in meat, median intakes of vitamin $B_{12}$ were quite high the day before the survey. The same was true of phosphorus, whose presence in foods is naturally associated with proteins. However, because the Inuit diet includes few calcium-rich foods, the calcium to phosphorus ratio was between 0.3 and 0.4. The recommended ratio is around 0.8 (SBESC, 1990). The implication of the calcium to phosphorus ratio, as found among the Inuit, deserves better attention, as a diet rich in phosphorus and particularly low in calcium can have deleterious effects on bone mass.

Magnesium is found primarily in legumes, seeds and vegetables. Since the Inuit had consumed little of these foods the day covered by the study, median intakes in magnesium were low for all age groups and sex distinctions (between 135 and 194 mg). Among the Inuit, tea and game meat were among the main sources of magnesium, providing 12% of intakes each. Together, bannock and white bread provided about 12% of intakes.

# 3.7 TRADITIONAL FOODS AND FOODS IMPORTED FROM SOUTHERN QUÉBEC

## 3.7.1 Nutritional contribution of traditional and imported foods

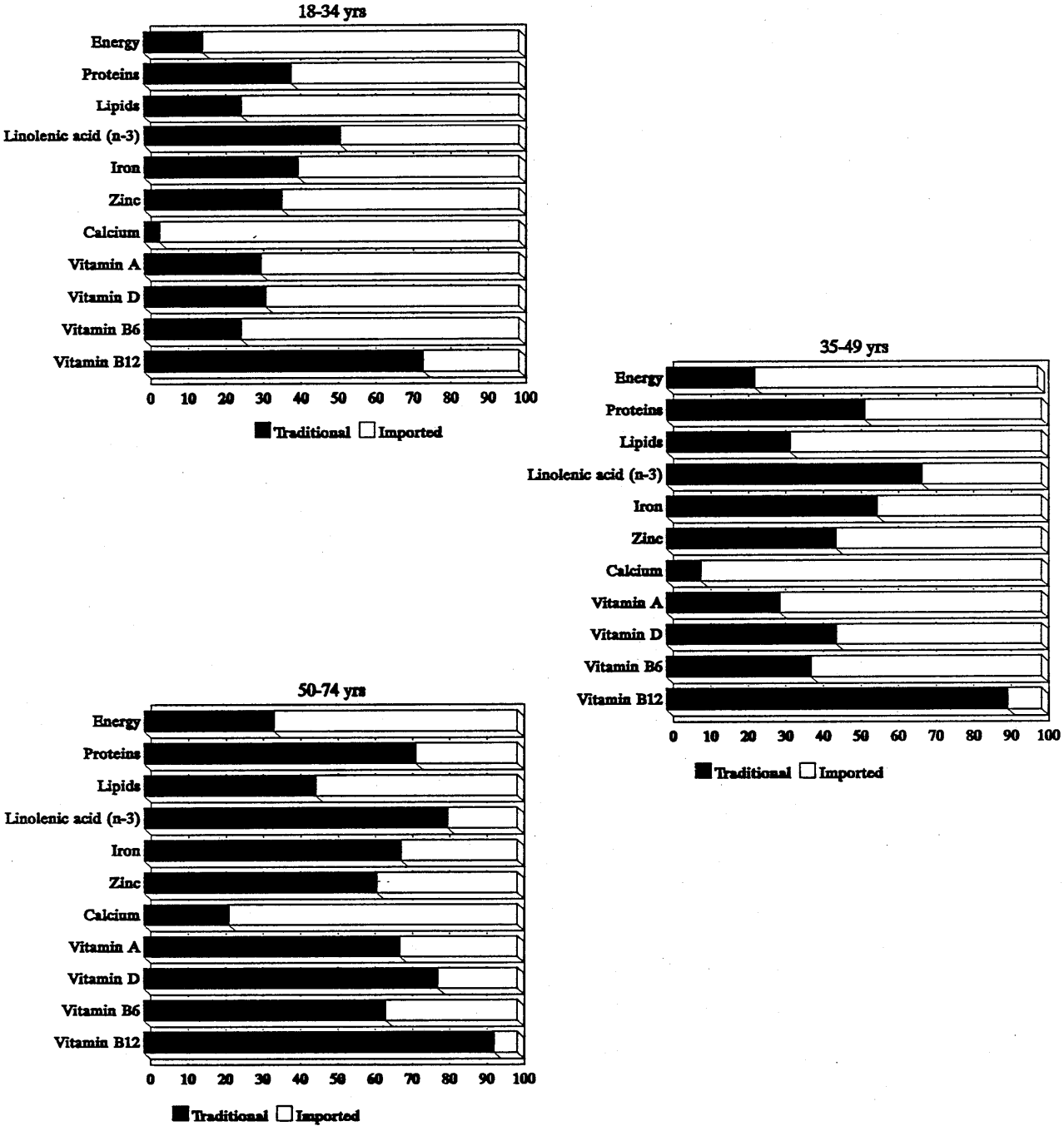
Graphs 3.25A and 3.25B show the contribution of traditional[1] and imported foods to energy and nutritional intakes by age and sex, the day before the survey. The mean contribution of traditional foods to energy and nutrients increased with age in both men and women. For example, traditional foods supplied on average less than 20% of the energy in young people between the ages of 18 and 34, whereas they supplied up to 35% of the energy among men between the ages of 50 and 74. More than 40% of the intake in several nutrients, including proteins, linolenic acid (n-3), iron, zinc, vitamin D, niacin, riboflavin and vitamin $B_{12}$, were derived from traditional foods. In individuals between the ages of 50 and 74, traditional foods supplied more than 50% of the intakes in cholesterol, phosphorus, vitamins D, E and $B_6$. The nutritional contribution of traditional foods reported by Lawn and Langner (1994) in their study of N.W.T. Inuit communities was comparable to that estimated in the present study, with the exception of proteins and iron, which accounted for as much as 60% of intakes in some communities.

Although there is no doubt that traditional foods play an important role in the diet of the Nunavik Inuit, in particular among individuals over the age of 50, this study underscores the major role played by imported foods in the Inuit diet. The day before the survey, these foods contributed more than 80% of the energy among young people and even among the older ones. They were also a considerable source of micronutrients, supplying more than 80% of the calcium, vitamin C and folic acid, and at least 50% of the zinc, vitamins A and D, thiamine, niacin, riboflavin and vitamin $B_6$. However, foods said to consist of empty calories also figured among store-bought products, supplying nearly 20% of the energy and close to 40% of carbohydrates.

(1) The term "traditional food" as used here designates only animal foods. Plants other than wild berries, are not, for all practical purposes, part of the Inuit diet.

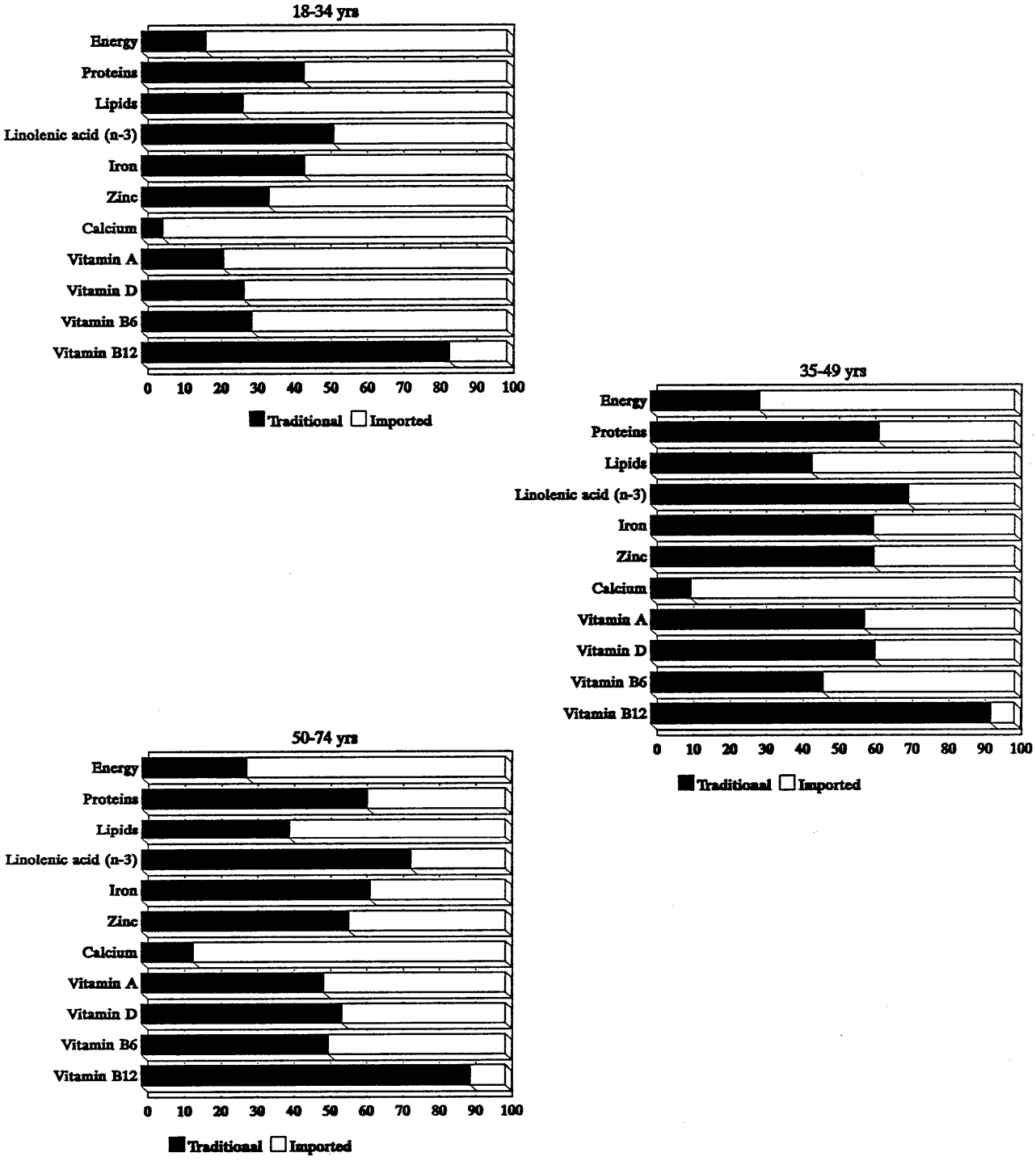
## GRAPH 3.25A

### Contribution of traditional and imported foods to intakes of energy and nutrients the day before the survey [Men] (%) [Inuit, 1992]



## GRAPH 3.25B

## Contribution of traditional and imported foods to intakes of energy and nutrients the day before the survey [Women] (%) [Inuit, 1992]



## 3.7.2 Consumption of traditional foods

**• Risks of contamination**

Based on the data collected during the 24-hour Recall, traditional foods play a relatively important role in the Nunavik Inuit diet. However, because these foods have been associated with certain contamination risks, their frequency of consumption deserves special attention.

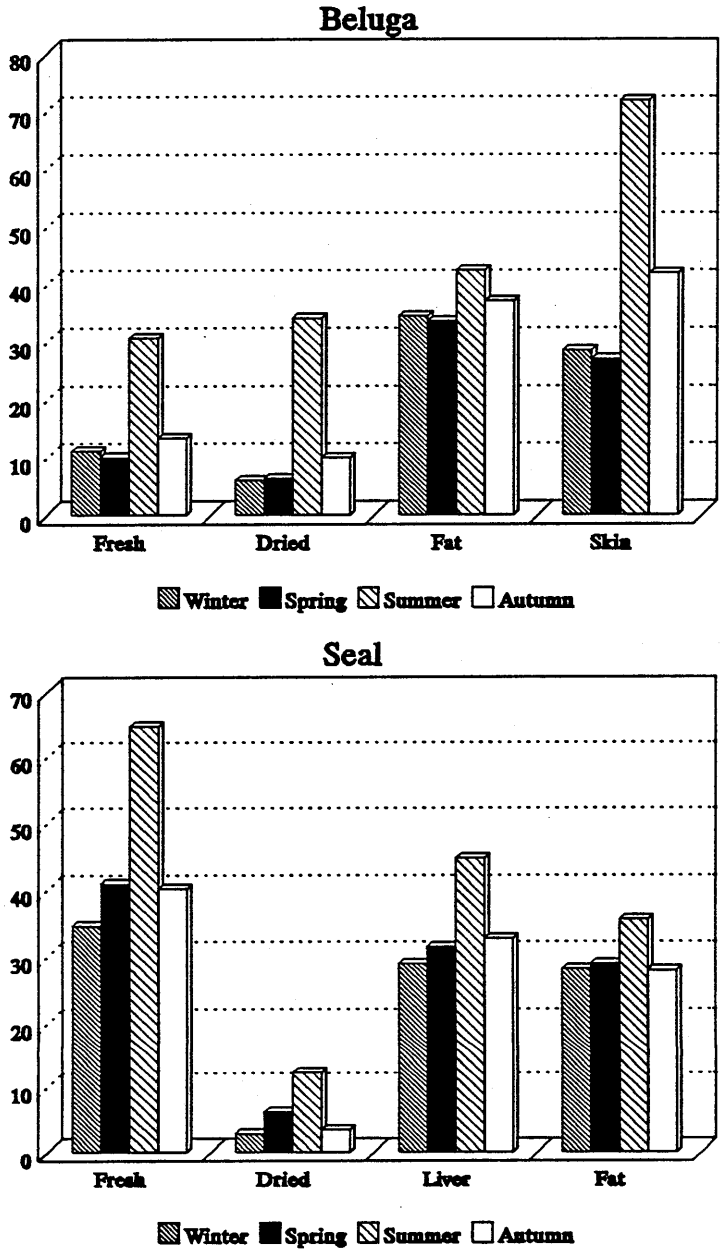
Organochlorines and **heavy metals** are the two main classes of contaminants that pose a problem for human health (Dewailly *et al.*, 1994). Organochlorines are stored in fatty tissues and are therefore found in greater concentrations in animals such as marine mammals, which have large quantities of adipose tissue. The main food sources that may contain heavy metals such as mercury and lead are fish and the organs of cervids and marine mammals. Theoretically, by eating these foods, the Inuit run the risk of exposure to contaminants, and this risk increases with the frequency and quantity of consumption (*ibid.*).

**• Seasonal variations in frequency of consumption**

Consumption of traditional foods can be influenced by the seasons: some foods are eaten only during a particular season, while others are eaten equally throughout the year. These seasonal variations were apparent in the answers to the Frequency Questionnaire covering consumption of certain foods for each season of the year preceding the survey. Graphs 3.26 (A,B,C) show the percentage of Inuit having consumed traditional foods at different seasons. The consumption of fresh caribou meat, fresh Arctic char, and seal and beluga blubber was more or less the same year round. Seal and beluga meat, beluga skin, fresh salmon and dried Arctic char were more likely to be eaten in summer. Wildfowl was available mainly in spring, and walrus and whale somewhat more in autumn, but the latter were eaten only rarely. It would seem that in winter, the Inuit depend for the most part on caribou meat, Arctic char, ptarmigan and (to a lesser extent) seal meat and fermented seal and beluga blubber. The Kuhnlein and Soueida study (1992) conducted in a Baffin Island Inuit community indicated that the most frequently consumed traditional foods on an annual basis were ringed seal, caribou and Arctic char, which partly agrees with the findings of the present study. This information was obtained from Inuit women by means of six 24-hour Recalls. Contrary to the findings of the Baffin Island study, narwhal, molluscs and walrus were not consumed frequently in the Nunavik region.

## GRAPH 3.26A

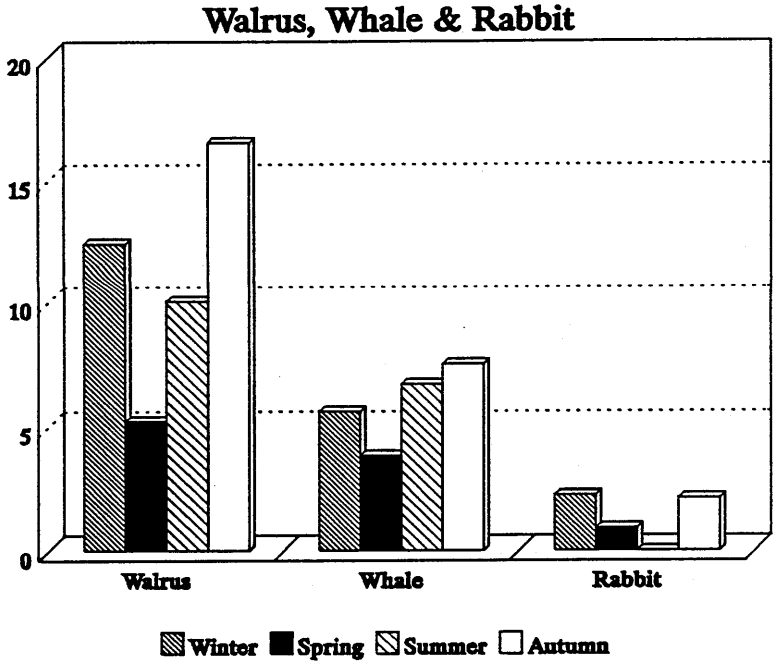
**Percentage of individuals having consumed traditional foods at different seasons[1] (Beluga and Seal) during the year preceding the survey [Inuit, 1992]**

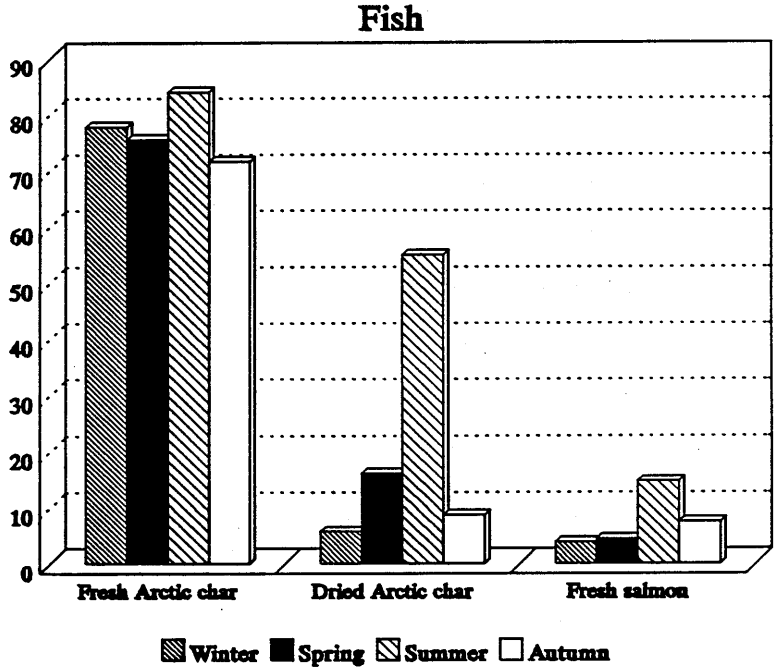



(1) **DEFINITION OF SEASONS (GRAPHS 3.26A, 3.26B AND 3.26C) :**

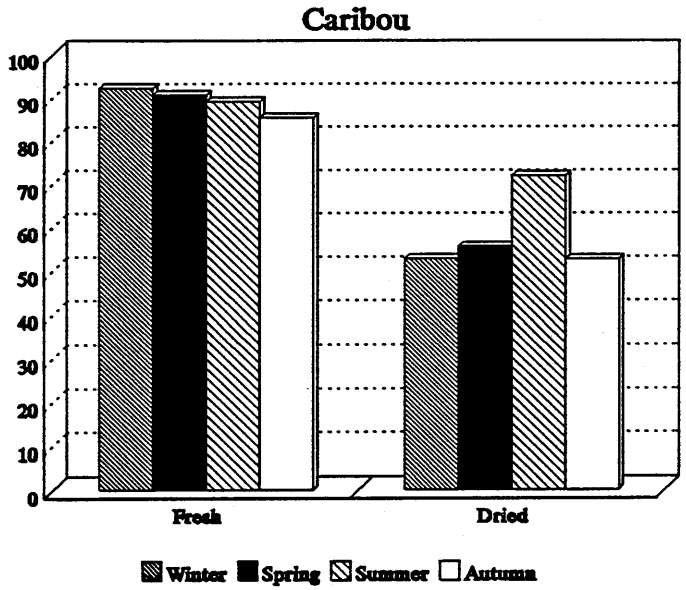
**Winter:** second half of November to March
**Spring:** April to June
**Summer:** July and August
**Autumn:** September to half of November

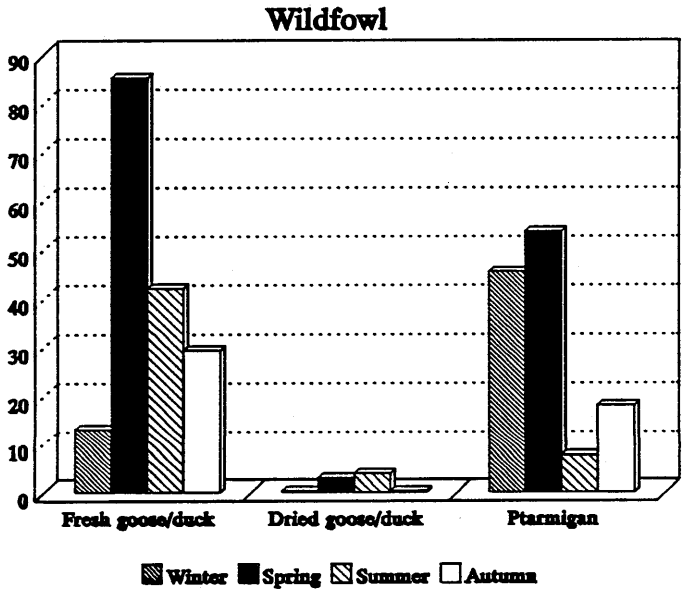
## GRAPH 3.26B


Walrus, Whale & Rabbit
20
15
10
5
0
Walrus
Whale
Rabbit
Winter
Spring
Summer
Autumn


Fish
90
80
70
60
50
40
30
20
10
0
Fresh Arctic char
Dried Arctic char
Fresh salmon
Winter
Spring
Summer
Autumn

## GRAPH 3.26C


Caribou
100
90
80
70
60
50
40
30
20
10
0
Fresh
Dried
Winter
Spring
Summer
Autumn


Wildfowl
90
80
70
60
50
40
30
20
10
0
Fresh goose/duck
Dried goose/duck
Ptarmigan
Winter
Spring
Summer
Autumn

The frequency with which these foods were consumed also deserves attention. Table 3.13 indicates frequency of traditional food consumption among women, during the season of peak consumption and for the year as a whole, based on the frequency of consumption for each season. In decreasing order of importance, the foods most frequently consumed by women during the previous year were fresh caribou meat (98%), fresh duck or goose meat (94%), fresh Arctic char (94%), beluga skin (91%), ptarmigan (85%), dried caribou meat (84%), fresh seal meat (82%), seal liver (64%), dried Arctic char (63%), beluga *misirak* (53%), seal blubber (49%) and seal *misirak* (41%). Fresh and dried beluga meat were consumed by 36% and 39% of women respectively. About 30% of women had eaten walrus meat during the previous year, and half that many had eaten whale. Age was not a significant factor (findings not presented) although fewer women between the ages of 18 and 34 had eaten walrus and seal blubber than women in other age groups. Beluga and seal *misirak*, seal meat and dried Arctic char were also less popular among younger women.

It is interesting to note that these findings generally concur with those of the 24-hour Recall. During the day before the recall, caribou meat was clearly the most popular traditional food, having been consumed by about 37% of Inuit, followed by fatty fish (especially Arctic char) (33%). These foods were also among the most popular according to the Frequency Questionnaire. However, in a study conducted by Freeman, Wein and Keith (1992) in the N.W.T. (Aklavik), mammals (especially caribou and beluga) were the most often mentioned food group, followed by fish and birds; caribou was by far the food most frequently consumed by the households surveyed. As for game fats, about 20% of Inuit had eaten some the day before the survey, with beluga blubber heading the list (12%), followed closely by seal blubber (9%). Consumption of these animal fats showed little variation across age and sex, with the exception of women between the ages of 18 and 34, who were less numerous in this regard. This lower popularity of animal fats among younger women was also evident in the Frequency Questionnaire results.

# TABLE 3.13

## Breakdown of women according to seasonal[1] and annual consumption frequency (n=228) (n, %) [Inuit, 1992]

| | | Never | < 1t./month | 1-3 t./month | 1-3 t. /wk | 4-6 t./wk | 7 + /wk |
|---|---|---|---|---|---|---|---|
| Beluga, (fresh, frozen, cooked) | Summer | 158 (69.4) | 25 (10.9) | 29 (12.7) | 12 (5.4) | 1 (0.3) | 3 (1.3) |
| | Year | 146 (64.1) | 55 (24.3) | 17 (7.6) | 8 (3.6) | 0 | 1 (0.4) |
| Dried beluga | | | | | | | |
| | Summer | 150 (65.9) | 25 (10.7) | 30 (13.2) | 18 (7.9) | 2 (1.0) | 3 (1.3) |
| | Year | 139 (61.0) | 53 (23.3) | 28 (12.5) | 8 (3.3) | 0 | 0 |
| Beluga, blubber & *misirak* | Summer | 131 (57.5) | 16 (7.1) | 31 (13.8) | 32 (13.9) | 7 (3.2) | 10 (4.5) |
| | Year | 108 (47.4) | 37 (16.4) | 31 (13.6) | 35 (15.3) | 6 (2.8) | 10 (4.5) |
| Beluga, skin | | | | | | | |
| | Summer | 64 (28.2) | 44 (19.1) | 74 (32.4) | 38 (16.8) | 3 (1.2) | 6 (2.4) |
| | Year | 21 (9.4) | 126 (55.5) | 50 (22.1) | 29 (12.7) | 0 | 1 (0.4) |
| Seal (fresh, frozen, cooked) | Summer | 80 (35.4) | 36 (15.7) | 78 (34.3) | 31 (13.6) | 1 (0.3) | 2 (0.7) |
| | Year | 41 (18.1) | 121 (53.0) | 50 (22.1) | 16 (6.9) | 0 | 0 |
| Dried seal | | | | | | | |
| | Summer | 200 (87.8) | 4 (1.8) | 10 (4.3) | 13 (5.8) | 0 | 1 (0.3) |
| | Year | 193 (84.5) | 18 (7.7) | 14 (6.2) | 4 (1.7) | 0 | 0 |
| Seal liver | | | | | | | |
| | Summer | 126 (55.3) | 41 (17.9) | 49 (21.3) | 13 (5.5) | 0 | 0 |
| | Year | 83 (36.4) | 104 (45.8) | 38 (16.4) | 2 (1.0) | 1 (0.3) | 0 |
| Seal, blubber & *misirak* | Summer | 147 (64.5) | 27 (11.7) | 30 (13.0) | 22 (9.8) | 0 | 2 (1.0) |
| | Year | 117 (51.5) | 62 (27.1) | 33 (14.5) | 13 (5.9) | 0 | 2 (1.1) |
| Walrus | | | | | | | |
| | Autumn | 190 (83.5) | 16 (6.9) | 15 (6.7) | 5 (2.2) | 0 | 2 (0.7) |
| | Year | 159 (69.6) | 53 (23.1) | 12 (5.4) | 4 (1.9) | 0 | 0 |
| Caribou (fresh, frozen, cooked)[2] | Year | 5 (2.0) | 15 (6.5) | 50 (22.0) | 129 (56.8) | 16 (7.0) | 13 (5.7) |
| Dried caribou | | | | | | | |
| | Summer | 64 (28.2) | 20 (8.8) | 59 (26.0) | 66 (29.1) | 8 (3.5) | 10 (4.3) |
| | Year | 37 (16.1) | 57 (24.9) | 60 (26.5) | 69 (30.2) | 3 (1.5) | 2 (0.8) |
| Goose/duck (fresh, frozen, cooked) | Spring | 34 (14.9) | 18 (8.0) | 46 (20.3) | 68 (30.0) | 15 (6.5) | 46 (20.3) |
| | Year | 14 (6.2) | 51 (22.4) | 81 (35.6) | 78 (34.1) | 3 (1.4) | 1 (0.3) |
| Arctic char (fresh, cooked) | Summer | 37 (16.1) | 10 (4.4) | 40 (17.8) | 100 (43.9) | 23 (9.9) | 18 (7.9) |
| | Year | 15 (6.5) | 21 (9.4) | 64 (28.1) | 100 (43.9) | 21 (9.1) | 7 (2.9) |
| Dried Arctic char | | | | | | | |
| | Summer | 103 (45.1) | 34 (15.1) | 31 (13.7) | 48 (20.9) | 3 (1.5) | 9 (3.8) |
| | Year | 83 (36.6) | 73 (31.9) | 50 (21.9) | 21 (9.1) | 0 | 1 (0.5) |
| Salmon (fresh, frozen, cooked) | Summer | 194 (85.3) | 15 (6.4) | 10 (4.3) | 9 (4.0) | 0 | 0 |
| | Year | 180 (78.8) | 33 (14.5) | 10 (4.6) | 5 (2.2) | 0 | 0 |

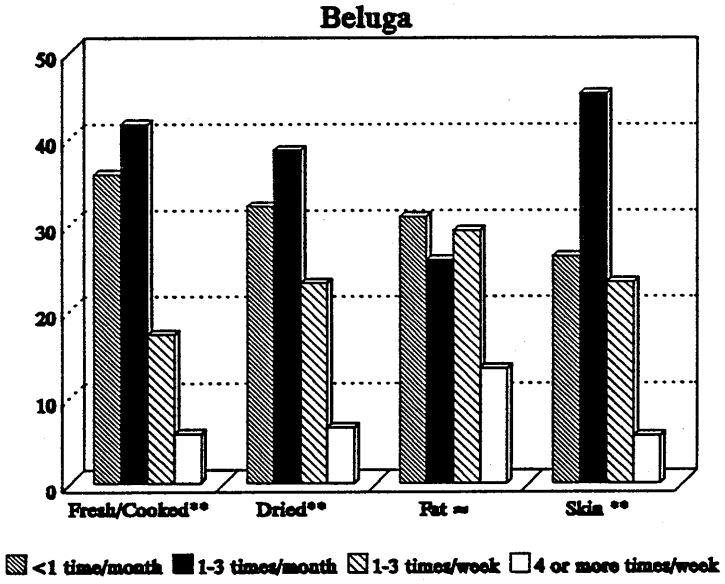
[1] Peak season for consumption frequency.
[2] No significant seasonal variation.

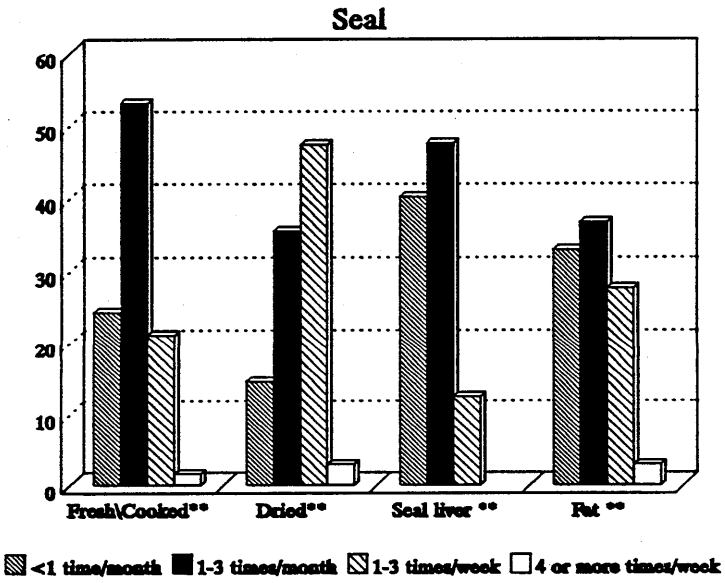
Depending on the survey instruments, however, there were a few differences for certain foods. For example, 42% of women reported having eaten beluga skin in autumn according to the Frequency Questionnaire, whereas, according to the 24-hour Recall, none of the women and less than 1% of the men had eaten any the day preceding the survey. As well, only 9% of individuals had eaten seal meat the day before the survey. Since the survey was held in autumn (September to mid-November), and seal meat and beluga skin are eaten primarily in summer, it was not surprising to find a few differences in consumption levels. Furthermore, even though consumption of certain foods was reported by several people in the Frequency Questionnaire, it is quite possible that these foods were not mentioned during the 24-hour Recall if they were consumed only once to three times a month, as is the case for a number of foods.

Graphs 3.27 (A,B,C) show the breakdown of individuals having consumed traditional foods during the previous year, according to frequency. For marine mammals, including beluga, seal, walrus and whale, frequency usually ranged from one to three times a month. However, beluga blubber and seal blubber, which are the edible parts of the animal most likely to contain contaminants like organochlorines, were eaten with relative frequency by a number of individuals. Findings show that 42% of women had eaten beluga blubber at least once a week in summer, and 13% of them reported having eaten it four or more times a week. Seal blubber was eaten once to three times a week by about 28% of women. Seal liver, theoretically a source of cadmium, was eaten by 48% of women one to three times a month in summer and by 12% of them one to three times a week. Fish, a potential source of **methylmercury**, was eaten more frequently than marine mammals. For example, among women who ate fresh Arctic char, more than half (52%) had done so one to three times a week during summer and 21% had done so four or more times a week. As for pink salmon, 27% had eaten it one to three times a week during summer. Caribou meat (excluding the organs) is not theoretically a source of contaminants; nearly three quarters (71%) of women had eaten such meat at least once a week during the year, of whom 13% had done so four or more times a week.

## GRAPH 3.27A

**Breakdown of individuals having consumed traditional foods during the previous year, according to consumption frequency[1] (Beluga and Seal) (%) [Inuit, 1992]**

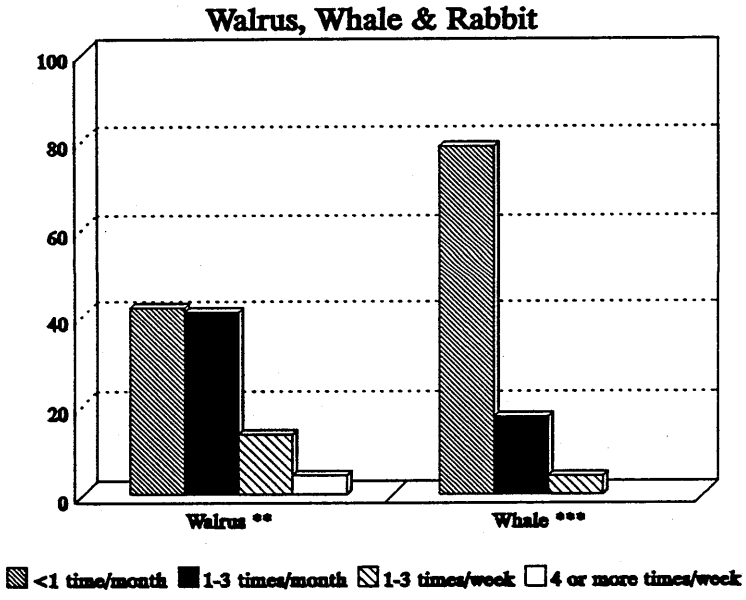


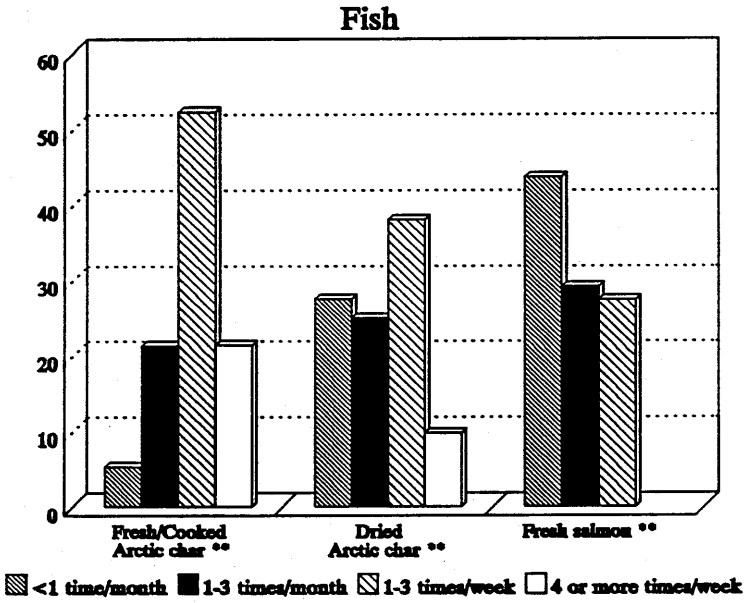




(1) For Graphs 3.27A, 3.27B and 3.27C, unless consumption of the food ranged equally across the year ≈, findings are given for the season in which frequency was highest:

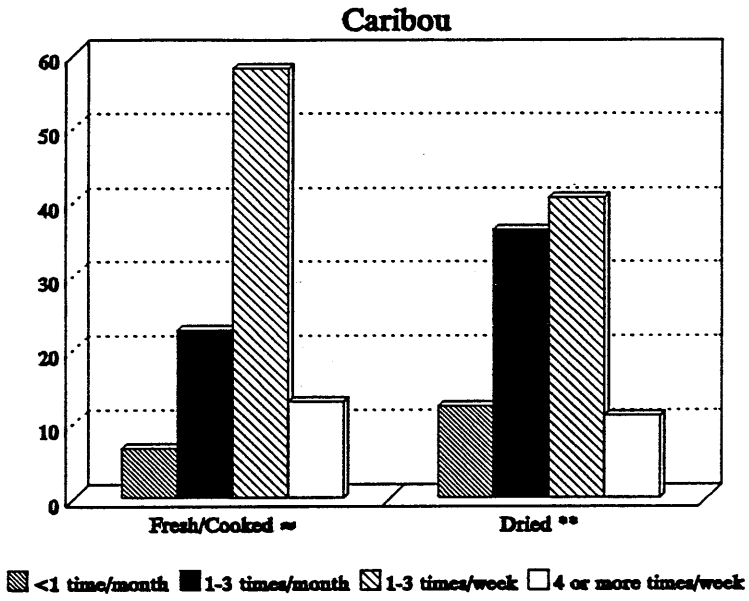
* spring ** summer *** autumn

## GRAPH 3.27B


Walrus, Whale & Rabbit
100
80
60
40
20
0
Walrus **
Whale ***
<1 time/month
1-3 times/month
1-3 times/week
4 or more times/week


Fish
60
50
40
30
20
10
0
Fresh/Cooked Arctic char **
Dried Arctic char **
Fresh salmon **
<1 time/month
1-3 times/month
1-3 times/week
4 or more times/week

## GRAPH 3.27C


Caribou
60
50
40
30
20
10
0
Fresh/Cooked ≈
Dried **
<1 time/month
1-3 times/month
1-3 times/week
4 or more times/week

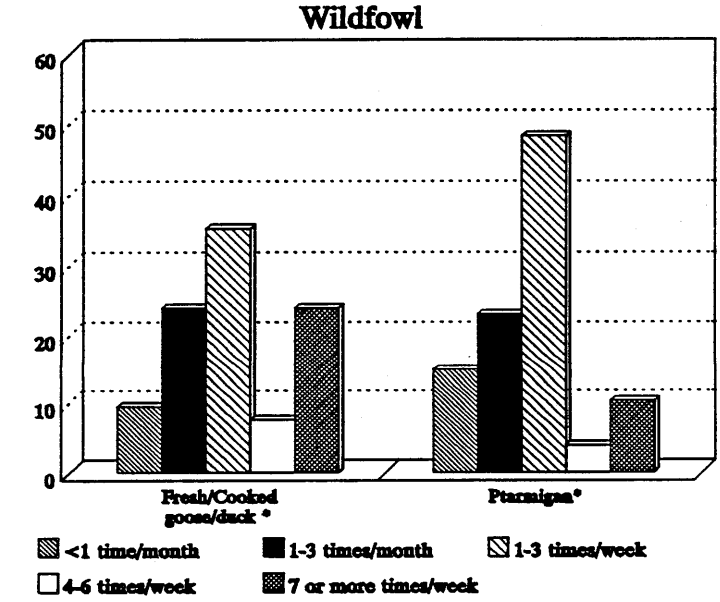

Wildfowl
60
50
40
30
20
10
0
Fresh/Cooked goose/duck *
Ptarmigan*
<1 time/month
1-3 times/month
1-3 times/week
4-6 times/week
7 or more times/week

Table 3.14 indicates the mean quantities of some traditional foods consumed by women, as reported in the Frequency Questionnaire. The mean quantities of caribou meat (139.9 g), seal, (123.3 g) and Arctic char (125.0 g) equalled about two servings of meat, whereas mean quantities of beluga were higher, equalling about four servings (235.2 g on average). The mean quantity of seal liver (82.5 g) equalled slightly more than one serving. Beluga blubber was generally consumed in smaller quantities than seal blubber, and the mean quantity of seal blubber consumed tended to be slightly higher among older women. The mean quantities reported for beluga skin (266 g and varying from 16.5 to 1562 g), suggest that these quantities were overestimated, possibly because the food model was ill-suited to estimating the quantity of skin consumed. The quantities of seal and beluga blubber estimated in this study compare with those reported by Kinloch, Kuhnlein and Muir (1992) in one Baffin Island community. However, the quantities of meat were slightly higher in the present study. Since the estimates of Kinloch *et al.* (1992) are based on six 24-hour Recalls, they are probably more representative of usual intakes among the Inuit.

**TABLE 3.14**

**Mean quantities (in grammes) of traditional foods consumed by women during the year preceding the survey (n) [Inuit, 1992]**

| Traditional foods | Age group | | | |
|---|---|---|---|---|
| | 18-34 | 35-49 | 50-74 | Total |
| Beluga (fresh, cooked) | 251.1 (31) | 239.8 (29) | 185.9 (22) | 235.2 (82) |
| Beluga, blubber | 11.8 (46) | 12.9 (39) | 12.0 (36) | 12.1 (121) |
| Seal (fresh, cooked) | 128.1 (79) | 128.9 (58) | 103.8 (55) | 123.3 (192) |
| Seal, blubber | 30.8 (38) | 34.6 (44) | 44.6 (41) | 35.4 (123) |
| Seal, liver | 85.3 (60) | 78.6 (47) | 79.0 (40) | 82.5 (147) |
| Arctic char (fresh) | 130.4 (91) | 131.3 (69) | 99.8 (56) | 125.0 (216) |
| Caribou (fresh, cooked) | 146.9 (98) | 138.6 (69) | 118.1 (56) | 139.9 (223) |

- **Frequency of consumption according to coast and sector of residence**

A higher proportion of women living on the Ungava coast than along the Hudson had eaten traditional foods during the year preceding the survey, including seal meat and blubber (especially in summer), beluga skin, whale and walrus (especially in winter and summer), dried caribou meat, ptarmigan and fish. Conversely, a higher percentage of women living on the Hudson coast had eaten beluga meat and blubber (especially in summer), seal liver, walrus (in autumn) and duck and goose meat.

The remoteness factor also influenced consumption of traditional foods: a greater proportion of women in sector B than in sector A had eaten marine mammal meat and blubber (except seal blubber) and Arctic char, while salmon was more popular in sector A. The consumption of wildfowl in both sectors varied with the seasons. This difference between the two sectors did not emerge in the analysis of the 24-hour Recall data. Finally, according to the study on food perceptions and behaviours (Delisle *et al.*, 1994), provisions of seal (but not beluga) were more frequent in sector B than sector A, as reported by individuals who did the cooking.

## 3.8 COMPARISON BETWEEN FINDINGS OF THE 1992 HEALTH SURVEY AMONG THE INUIT AND NUTRITION CANADA ESKIMO SURVEY OF 1971

In comparing the results of the two studies, a measure of caution is called for since the Eskimo's Nutrition Canada survey (SBESC, 1975; 1976) included the Inuit of four communities in Canada and the sample was very small (including 194 men and non-pregnant women aged 20 and over). Further, consumption estimates in the two studies, based on the 24-hour Recall, do not necessarily reflect the customary diet. Finally, in the 1975 and 1976 Canada Nutrition reports, the findings are expressed only in the form of mean values, which can be strongly influenced by extreme values.

Nonetheless, the data collected suggest that eating habits in terms of number of servings from the different food groups have changed little in recent years. For example, according to the 1971 (SBESC, 1976) 24-hour Recall findings, adults had eaten, on average, about 0.3 servings of dairy products, compared with 0.5 servings the day before the present survey. Mean consumption of vegetables was estimated at about 60 grammes in 1971 and nearly 100 grammes in 1992. The estimated average consumption of fruit was similar for both periods. However, in the 1971 survey (SBESC, 1976), the fruit group included vitamin C-enriched fruit drinks, whereas they were excluded in the 1992 survey. The mean consumption of meat and meat substitutes estimated in 1971 (SBESC, 1976) was comparable to that observed in 1992 among women, but relatively higher in 1992 among men under the age of 50, indicating that sources of meat changed considerably in the interim. In 1971 (SBESC, 1976), mean quantities of game meat (especially caribou) consumed on the day under study varied between 200 and 460 g depending on age and sex, whereas the quantities reported for the day preceding the 1992 study were between 70 and 190 g. As well, Inuit below the age of 50 nowadays seem to consume considerably more store-bought meat than in the past. During the 1971 24-hour Recall (SBESC, 1976), mean consumption of soft drinks was about 300 to 390 g among men aged 20 to 54 and women aged 20 to 39. In the 1992 survey, mean intakes were 330 to 370 g among young people between the ages of 18 and 34, but considerably lower (162 g) among men between the ages of 35 and 49.

In terms of nutrients, mean energy intakes among Inuit men over the age of 50 and among women were lower in 1971 than among the Inuit population surveyed in 1992. Further, the mean contribution of lipids to energy intake was lower in the 1971 survey (SBESC, 1975), ranging from 23 to 30%, while it varied between 36 and 43% in the 1992 survey. However, the percentage of calories from proteins varied from 21 to 35% in 1971 (SBESC, 1975), and from 17 to 23% in 1992. These changes in the contribution of lipids and proteins over the past twenty years are probably attributable to a higher consumption of store-bought meat and prepared meals and to a lower consumption of game meat. In addition, the mean contribution of carbohydrates to energy intake was slightly lower in the more recent study, varying from 40 to 51% in 1975 against 34 to 45% in 1992. The data collected in these two surveys, although limited, suggest that energy intakes for certain subgroups of the population have increased over the past twenty years, due mainly to a higher consumption of lipids from fattier meat, prepared meals and junk food, at the expense of traditional foods.

The 1992 study was not intended to serve as an official comparison between the estimated nutritional intakes of the Inuit population and the recommended intakes. However, the findings suggest that intakes in calcium, vitamins A, C and D, and folic acid, as estimated from the 24-hour Recall, are low for most age groups. The same conclusions were drawn in the Eskimo's Nutrition Canada report for the survey conducted in 1971 (SBESC, 1975).

## 3.9 DISCUSSION AND CONCLUSIONS

This food survey is the first of its kind to have been conducted with a representative sample of the adult Inuit community of Nunavik. The 24-hour Recall made it possible to estimate this community's energy and nutritional intakes the day before the survey, and the Frequency Questionnaire administered to women only (aged 18 to 74, none of whom was pregnant or nursing) provided a more accurate profile of the customary Inuit diet. It must be noted, however, that the survey methods used may not be the most appropriate with respect to the Inuit lifestyle. Despite growing similarities in eating habits between southern Quebecers and the Inuit, the latter's lack of familiarity with this type of interview may have influenced the quality of the information collected. Nonetheless, approached with the right measure of caution, this study enables us to draw a few general conclusions on food consumption among the Inuit of Nunavik.

First, there is reason to believe that the 1992 survey on food consumption over the course of one day underestimated the usual energy intake. The survey on the health of the Inuit suggests that 21% of Inuit are overweight (body mass index (BMI) between 25 and 27 $kg/m^2$) and 19% are obese (Delisle *et al.*, 1994). But median energy intakes estimated the day before the survey were not excessive and compared with those reported for the Québec population (SQN, 1990) and other Inuit communities in Canada (Lawn and Langner, 1994). The survey

of Quebecers (SQN, 1990) does report this divergence between the energy intakes of Quebecers and their theoretical needs, and assumes that mean intakes were underestimated.

For certain age and sex subgroups (middle-aged women, older men), median intakes in proteins and lipids were higher among the Inuit than for the Québec population, whereas intakes in carbohydrates and dietary fibre were low for all subgroups surveyed. This difference can be principally explained by a diet rich in meat, poultry and fish (including game) and rather low in fruit and vegetables.

As observed in other studies conducted among Inuit communities (Wein, 1986; Schaefer and Steckle, 1980), median intakes in calcium, vitamins A, D and C, and folic acid the day before the survey were rather low due to scant consumption of dairy products, fruit and vegetables. On the other hand, median intakes in iron were quite high (except for women under the age of 35), owing to a high consumption of meat.

Fish oils contain appreciable quantities of n-3 fatty acids. Thus, the 1992 survey showed a median intake in n-3 fatty acids slightly higher among the Inuit than among the southern population (except for younger men), which translates into better protection against cardiovascular disease.

At this point, a few comments about the consumption of bannock, the equivalent of bread among the Inuit, and its undeniable role in their diet are in order. Bannock was the primary source of energy, carbohydrates, dietary fibre, saturated fats, polyunsaturated fatty acids, and linoleic acid, the second source of lipids and the fourth source of proteins on the day before the survey. Among men and women over the age of 50, about a third of the energy and lipids came from bannock. Because bannock is consumed in large quantities and frequently, the population should be encouraged to bake it in the oven rather than pan-frying it, which requires large quantities of lard. Some Inuit subgroups had high intakes of lipids, which is why reducing consumption of lard would promote a better energy balance. Bannock could also be prepared with milk instead of water only, as is already being done in some Inuit communities. This would help increase calcium intakes, which were relatively low in this community the day before the survey. However, increase in calcium intakes should not come solely from greater consumption of dairy products, but also from eating more legumes and other vegetables rich in calcium, and by rediscovering the old habit of chewing the spongy part of mammal bones (Schaefer and Steckle, 1980). As well, a recent study conducted in Baffin Island revealed that the skin of the Arctic char was an excellent source of calcium (268 mg of calcium per 100 g of skin) (Kinloch, Kuhnlein and Muir, 1992).

The Santé Québec survey also underscored the influence of sociodemocratic factors like age, sex and level of education on the Inuit's eating habits. In general, the data collected during the 24-hour Recall suggest that the popularity of traditional foods increases with age whereas

that of imported foods diminishes among both men and women. As far as the level of education is concerned, the reverse trend was evident, but since this is an age-related factor, its real influence remains to be confirmed. Freeman, Wein and Keith (1992) also found that age was a positive factor but that level of education was a negative factor in the consumption of traditional foods in a Northwest Territories community (Aklavik). The team of Moffatt, O'Neil and Young (1991), who conducted the study in the district of Keewatin (N.W.T.), reported that the source of meat varied depending of the age group: the younger people often bought meat from the store, while the older members of the community obtained it from hunting and fishing, which is consistent with the findings of the present survey.

Geographical differences in food and nutritional intakes were also reported. Thus, residents of the Ungava coast seemed to depend more on imported foods than on traditional foods when compared with residents of the Hudson coast. Ungava residents consumed more dairy products, fruit and vegetables, cereal products, (other than bannock), imported fats, beverages and soft drinks than Hudson inhabitants.

When placed in their historical and cultural context, the differences observed between the two coasts of residence become clearer (Proulx, 1994). In the past, Hudson inhabitants displayed greater autonomy and some were more reluctant to embrace change, as witness their refusal to sign the "James Bay and Northern Québec Agreement" in 1975 for hydroelectric development of the territory; in this they showed less openness to Southern Québec than their Ungava neighbours. On the other hand, Ungava natives soon felt the consequences of openness to progress and, with Kuujjuaq as the administrative capital of the region, communities were rapidly exposed to the influence of the rest of the province and the outside world.

The study however revealed little difference in food intakes according to administrative sector, a breakdown that makes it possible to distinguish among villages depending on ease of access and living conditions. Nonetheless, the diet in sector A seemed more varied, which probably reflects greater accessibility, and the population consumed more vegetables, less game fat, bannock, soft drinks and fruit drinks than in sector B. In the latter, soft drinks and fruit beverages were the second largest source of energy and number one source of carbohydrates. The findings of the Frequency Questionnaire also suggest that women in sector B ate meat and marine mammal fat with greater frequency than women in sector A.

In both the present study and the survey conducted by Nutrition Canada in 1971 (SBESC, 1975; 1976), it appears that the contribution of the various food groups in energy and nutrient intakes has remained relatively stable for men and women in most age groups. However, the consumption of traditional foods has dropped considerably over the past twenty years, in contrast to imported meats. A more sedentary lifestyle and greater access to imported products has displaced the traditional diet in favour of a Western diet. Because

imported foods are a growing factor in the Inuit diet, it is important to ensure that the foods available are nutritious, accessible to all and available year round. On the other hand, there is a need to educate the population about sensible choices, since it is often through lack of knowledge that people chose less nutritional foods. Subsidies for air transportation of perishable foods are one example of a project whose goal was to reduce the price of store-bought foodstuffs and make them more readily accessible to consumers, but it would seem that the project did not have the expected effect in certain regions (Lawn and Langner, 1994).

Fear of contaminants may have played a role in reducing the consumption of traditional foods over the past few years (Dewailly *et al.*, 1994). Nevertheless, traditional foods remain an important source of nutrients for the Inuit, and health care practitioners should identify those foods that deserve greater attention because of the frequency and quantity of consumption. They could then make recommendations aimed at reducing the risks and optimizing the benefits of a diet based on traditional foods. According to one study on contaminants, it was the organs of marine mammals, and their fat and skin that were most likely to be contaminated (Kinloch *et al.*, 1992). For example, narwhal contributed 40% of all contaminants. The findings of the present study suggest that narwhal was not eaten in Nunavik communities during the year preceding the survey, and that the organs of mammals were rarely eaten. On the other hand, the fat and skin were consumed frequently, especially by women aged 35 and over. Women of childbearing age must be urged to reduce their exposure to contaminants to avoid damaging the fetus; they should be particularly wary of eating the skin and fat of marine mammals. Since these foods make a major contribution to the intake of several nutrients (linolenic acid, zinc, magnesium, vitamin A), reduced consumption should be compensated by the addition of substitute foods. Finally, it is reassuring to note that caribou, Arctic char and wildfowl, which were the most frequently consumed traditional foods among the Inuit surveyed, did not seem to be major sources of contaminants. Consumption of these foods should therefore be supported and encouraged, as they supply an appreciable quantity of nutrients and reflect Inuit cultural identity.

## 3.10 SUGGESTIONS FOR FUTURE ANALYSES

This chapter summarily describes the diet of the Nunavik Inuit. The available data could be used for a much more in-depth analysis. The following are suggested avenues of research:

- Establish the link between nutritional intakes and the time of the month in which the survey took place. Since a large number of Inuit households depend on social assistance, it is likely that the period of the survey has an influence on the quantity, quality and source of the foods consumed.

- Examine the relation between traditional diets, as estimated from the Frequency Questionnaire, and the blood concentrations of various contaminants. Use the

results of the Frequency Questionnaire for this purpose, not the 24-hour Recall, which focuses only on one day.

- Check to what extent the data on perceptions and dietary behaviour corroborate the data from the 24-hour Recall and the questionnaire.

- As mentioned in the report, analyze the data (controlling for age and sex), to check whether the relations between food and nutritional intakes and the sociodemographic variables (coast and sector of residence, and level of education) are not due to combined factors (age and sex).

- Apart from the sociodemographic data considered in this report, the relation between the Inuit's food and nutritional intakes and the makeup/structure of households could also be examined. There is a possibility that the food intakes of individuals from large or lone-parent families are different from those of individuals from a smaller family or a two-parent family.

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# APPENDIX 1

# THE 24-HOUR RECALL APPOINTMENT CARD

**Santé Québec INUIT Health Survey**

HOME VISIT for the NUTRITION PART

NAME: _____

Thank you for your collaboration in the Santé Québec INUIT Health Survey. Your participation is essential since you have been randomly chosen to represent peoples of your sex and age.

WE HAVE AN APPOINTMENT AT YOUR HOME ON:

DATE: ___ / ___ / ___ TIME: _____

We look forward to seeing you.

Nurse: _____

ᑯᐸᐃᒋ ᖃᓄᐃᖅᑎᑦᓯᓕᕆᓂᖅ ᐃᓄᐃᑦ
ᖃᓄᐃᖅᑎᑦᓯᓂᖅᓴᓂ ᖃᐅᔨᓴᓂᖓ

ᐊᓂᔮᒧᑦ ᐅᓪᓗᐊᓂᓕᒃ ᓂᕆᑦ ᒥᑦᓱᓄᑦ

ᐊᑎᖏ:_____

ᓇᑯᓴᐅᒍᑦ ᐃᑲᔪᒋᓪᓚᕆᔭᕐᓇᖅᑐᑦ ᑯᐸᐃᒋᒥ
ᖃᓄᐃᖅᑎᑦᓯᓂᖅᓴᓂ ᐃᓄᐃᑦ ᖃᓄᐃᖅᑎᑦᓯᓂᖅᓴᓂᓪᓂ
ᖃᐅᔨᓴᓂᓂᖃᖏᓪᓗᒍᑦ. ᐃᓕᐅᕈᒪᐊᖃᖏᑐᑦ ᖃᐅᔨᓴᓂᓂᒍᑦ
ᖃᐅᔨᓴᓂᑕᐅᓕᖓᔪᓄᑦ ᐃᓕᐅᕈᔪᑦᓴᓕᐊᑐᒍᓱᒋᔭᐅᓂᖅᑐᑦ
ᑭᓚᑐᓴᑎᑭᐅᓂᐊᓂᑐᓄᑦ ᐃᓅᖃᖏᑎᑎᓄᑦ
ᐊᓯᔪᑎᐅᖃᖏᑎᑎᓄᑦ ᐊᓂᓕᐅᖃᖏᑎᑎᓄᒍᓱᓂᑦ
ᐅᑭᐅᖃᖏᑎᑦᓯᒋᓗᒃ.

ᐃᓕᓴᓯᒪᓂᐊᖃᓕᕐᓂᒍᑦ ᐃᒪᐃᓐᓄᐊᓕᓴᐅᑦ:

ᐅᓐᓄᖃ:__/__/__ ᑲᐃᕿᓐᓇᒋᓯᖃ:_____

ᐃᓕᓴᓂᓂᒃ ᑕᑯᓇᓚᐅᑦ ᕿᓇᓗᓂᕐᓂᒍᑦ.

ᑯᓐᓂᐊᓯᐅᓂᑎ:_____

# APPENDIX 2

# THE 24-HOUR RECALL

## ORIGINAL VERSION

ONLY THE ENGLISH/*INUKTITUT* BILINGUAL VERSION OF THE INSTRUMENTS WAS USED TO COLLECT THE DATA.

# SANTÉ QUÉBEC INUIT HEALTH SURVEY

Participant number: 7 [ ][ ][ ][ ][ ]  nur. [ ][ ]  BIRTH YR [ ][ ]  MONTH [ ][ ]  DAY [ ][ ]  sex [ ]  If woman: [ ]
1= pregnant
2= breast feeding
3= not pregnant nor breast feeding
8= DNK

Date interview: [ ][ ] month [ ][ ] day

Language [ ]

24-HOUR DIET RECALL

On what day of the week is the follow-up done? _____

| HOURS 00:00 24:00 | E | M | S | FOOD DESCRIPTION | 3 OF SERVING | SERVING DESCRIPTION | |
|---|---|---|---|---|---|---|---|
| | | | | | | MODEL | THICKNESS |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |

Have you prepared yourself most of these meals ? YES [ ] NO [ ]

Check column E (√) when foods were eaten in a restaurant, at a cafeteria, or taken out already prepared.

If food was eaten during a meal, enter in column M (M, for a first meal, M2, for a second, etc.).

If food was eaten during a snack, enter in column S (S1, for a first snack, S2, for a second, etc.).

# FREQUENCY OF NUTRITION SUPPLEMENT

| NUTRITION SUPPLEMENT | DIN # | QUANTITY | FREQUENCY | | | |
|---|---|---|---|---|---|---|
| | | | YESTERDAY | DAY | WEEK | MONTH |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Respondent helped by a third party? YES ☐ NO ☐

## RECIPE # 1

Name of recipe : _____

Total number of servings : _____

| DESCRIPTION OF RECIPE AND COOKING METHODS | QUANTITY |
|---|---|
| | |
| | |
| | |
| | |
| | |
| COOKING METHODS : | |
| | |
| | |
| | |

## RECIPE # 2

Name of recipe : _____

Total number of servings : _____

| DESCRIPTION OF RECIPE AND COOKING METHODS | QUANTITY |
|---|---|
| | |
| | |
| | |
| | |
| | |
| COOKING METHODS : | |
| | |
| | |
| | |

# APPENDIX 3

# FOOD FREQUENCY QUESTIONNAIRE

## ORIGINAL VERSION

ONLY THE ENGLISH/*INUKTITUT* BILINGUAL VERSION OF THE INSTRUMENTS WAS USED TO COLLECT THE DATA.

ᖃᐅᔨᓴᐅᑎᖏᑦ ᓇᓗᐊᑎᖏᓐᓄᑦ:
Reference Number: _____

# ᑯᐱᐣ ᐃᓄᖏᑦ ᐊᓐᓂᑦᑕᐃᓕᓪᓚᑦ ᓂᕈᑦᓱᐊᓐᓄ ᖃᐅᔨᓴᖏᑦᑕᐅᔪᑎᖏᑦ
# QUEBEC INUIT HEALTH AND NUTRITION SURVEY

## II. ᓂᕈᑎᖅᑐᔪᐊᖏᑐᐃᑦ
## Food Frequency

ᐊᐱᖏᓱᒪᓕᒋᑦ ᐃᓕᖏᓂᓂᒃ ᖃᓄᐃᑎ ᓂᓪᓗᐊᓐᖓᔪᐊᓂᖏᓪᓕᖅᓱᖏᓂ ᐅᐸᓪᓂ ᐃᒥᓱᓂᕆᐃᑦ ᐃᓕᖏᓂᓂᒃ ᓂᕈᑦ (ᐃᓄᓕᖏᑕᒃ ᐊᓕᒪ ᓂᐅᐃᖏᐃᓂᑕᖏᒃ ᓂᕈᑎᓂᒃ). ᓱᑲᓪᓕᒥᒃ, ᖃᐅᔨᓴᖅᑭᒪᖏᓐᓄᑦ ᐃᓄᓕᖏᑕᒃ ᓂᓪᓕᒪᓂᐅᓂᖏᓪᓕᖅᑎᑦ ᑕᒪᒃᑯᐊ ᐅᐱᖏᓐᓄᓪᓕᐊᓕᒋᑦ ᐅᑭᐅᖏᓐᓄᓪᓕᐊᓕᒋᑦ ᒪᓕᒃᓱᒋᑦ. ᑭᓇᓕᓕᒫᒃ ᐊᐱᖏᓱᓕᓐᓄᓐᓄ ᐊᑐᓂᑦ ᐃᓄᐃᑦ ᓂᕈᑦᑕᒥᑦ ᒥᒃᓴᓕᑦ (ᐊᑎᓐᓄᐃ ᑐᓂᓂᐊᓐᓄᖅᑎᑦ ᐊᐱᖏᓱᑎᐅᔪᒪᖏᑦ).

I would like to ask you some questions about how often you eat or drink certain foods (country and store-bought foods). First, I would like to know if you ate some country foods over the past 4 seasons. I will ask a series of questions for each country food (please give the card to the interviewee).

ᐱᒋᐊᑎᖅᓄᖏᑦᑕᓕᕆᐊᖅ ᖃᓄᓚᖏᒃ ᖃᐅᔪᖏᒃ (ᓄᑦ ᐅᕐᓂᓗ ᖁᐊᖅ ᐅᕐᓂᓗ ᐃᓚᓱᒪᔪᖅᓄᖅᓚᓱᒪᔪᓱᓗ).
Let's start with BELUGA (fresh or frozen or cooked).

| | |
|---|---|
| 1. ᖃᓄᓚᓕᐊᓂᑐᓄᐅᑦᑕᖏᑦ ᖃᐅᔪᖏᒃ ᐅᑎᑐᒍᓄᐅᑐᑎᑦ? | ᑎᑎᖏᓚᓗ ᐊᓕᔪᖅ ᐅᕐᓂᓗ ᐊᐅᓗ ᓱᑲᓪᓕᖏᒃ. ᐊᐅᓚᐅᒃᑯᑦ, ᑭᒧᓪᓕᓕᓄᑦ ᑎᑎᖏᓚᔪᓄᑦ ᓂᕈᑦᓱᐊᓐᓄᖅᑎᑦ) |
| 1. Did you eat BELUGA over the past year? | **Enter YES or NO in the first column. (If NO, go to the next country food)** |
| 2. ᐊᑦ ᓯᐊᖏᑦᑐᑦ, ᓂᓪᓕᐅᓄᖏᑦ ᖃᐅᔪᖏᒃ ᐅᓪᓂ... | ᖃᒥᖃᓚᔪ ᐅᕐᓂᓗ ᑕᓄᖏᓄᓂᓂᒃ ᓇᓪᓕᐊᖏᔪᓄᓕᒃ ᐃᓂᓕᓄᖏᓕᓕᔪ. ᑕᒪᓕ ᓱᑲᓪᓕᖏᑦ ᓂᕈᑎᓂᒃ, ᓇᓚᓇᐃᓕᖏᓱᒪᖏᓚᔪ ᑕᓄᖏᓕᓕ ᓇᓪᓕᐊᖏᔪᓄᓕᒃ ᐊᐱᖏᓱᑕᐅᓂᑦ. ᓇᓚᓇᐃᓕᖏᓱᐊᖏᑦᑐᑦ, ᐊᓪᓕᓚᔪ ᐊᓪᓕᐊᓂᓄᓕᒋᑦ ᐊᓕᒪᓚᖏᓱᔪᔪ ᑕᓄᖏᓄᓕᒃ ᐊᓕᒪᓚ ᖁᓇᐃᑐᒥᒃ ᓂᓪᓗᐊᖏᔪᓄᓕᒃ ᐊᐱᖏᓱᑎᓂ ᓇᓚᓇᐃᔪᔪ. |
| 2. If YES, did you eat BELUGA in ... | **You can check one or several seasons in the appropriate columns. At this point for the first food, give the definition of seasons to the interviewee. If his/her definition differs, please record them on this sheet by circling/adding the months and use his/her definition for this part of the food frequency questionnaire.** |

ᐅᑭ ᐅᑭᐅᖅ
WIN Winter
ᐅᐱ ᐅᐱᖏᓱᖅ
SPR Spring
ᐊᐅ ᐊᐅᓴᖅ
SUM Summer
ᐅᑭᐊ ᐅᑭᐊᓱᖅ
FAL Fall
ᐃᖏᖅᐅᒪᖏᓐ
DNK Do not know (or cannot recall)

ᖃᐅᔨᓪᓚᐅᑎᖏᑦᑐᖅ ᓇᓴᐅᑎᖏᓐᓄᑦ:
**Reference Number:** _____

. ᖃᓄᑎᒥ ᓂᓚᔨᓪᓘᓐᓃᑦ ᖃᓄᐊᓕᕆᔨᒃᑯᑦ ᑕᒪᓐᓇᐅᑎᑦᓯᔪ ᑕᐃᒪᓐ ᐅᓐᓂᒃᑯᑦ ᓄᓇᕗᒻᒥᐅᑦ?
. How often did you eat BELUGA during that or those season(s)?

ᐊᓪᓚᕆᔨᒃᑯᑦ ᐊᓐᓄᓚᔪᓐ "ᖃᓄᑎᒥᓚᐅᑦ"

**Enter the chosen letter under the column "How often"**

. ᐊᑕᐅᖅᐊᖅᑎᓪᓗ ᐅᓐᓄᒥ
. once a day
. ᐊᒥᓚᐃᓐᓇᓪᓗ ᐅᓐᓄᒥ
. several times a day
. ᐊᑕᐅᓚᐊᖅᑎᓪᓗ ᓚᖓᐃᓐᓇᓚᖅᑐᓂᑦ ᐱᓕᓚᐅᓚᖅᑎᒥ
. once or twice a week
ᐱᖓᓚᐃᓐᓇᓪᓗ ᓚᖓᐃᓐᓇᓚᖅᑐᓂᑦ ᐱᓕᓚᐅᓚᖅᑎᒥ
. three or four times a week
ᐊᑕᐅᓚᐃᓐᓇᓪᓗ ᑕᖅᑎᒥ
. once a month
. once or twice during that season
. ᐃᖅᑲᐅᒪᖅᑎᒥ
. cannot recall

. ᑕᒪᓐᓇ ᐊᑐᓚᓪᓗ "ᐱᐅ-3", ᖃᓄᑎᒥᓂᔪᐊᖅ ᖃᓄᓕᒫᓚᐅᑦ ᓂᓚᐃᒪᓚᐅᑦ?

. Using this model "PO-3", what is your usual serving when you eat BELUGA?

ᑭᒃᓯᔪᓐᓇᖅ ᐊᓐᓄᓕᕐᓗ ᐊᑕᖓᓂ "ᓂᓚᔪᐊᖅᓯᔪᐊᓯᑦ"
ᖃᐅᔨᓴᓕᐃᒃ: ᖃᐅᔨᓚᖅᑭᑐᐊᖅᑦ, ᑐᓴᕐᓂᑐᑐᐃᓐᓇᖅᑐᓂᒃ ᐊᓐᓄᓚᔪᓐᓇᓪᓗ "ᐅᖃᐅᓯᓚᑦᓂᒃᑯᑦ" ᐊᓐᓄᓚᔪᓐᓇᖅᓂ.
**Enter the number under the column "Usual serving"**
**NOTE: If there is any doubt, please enter the information under the "Comments" column.**

## ᓄᓇᕗᑦᑐᓂᒃᑯᓐᓇᖅᑐᖅ:
## Definition of Seasons:

ᑭᐅᖅᑕᖅ: ᖁᓕᓚᓂ-ᓄᐃᒪᓚ, ᑎᓯᒪᓚ, ᐅᓄᐊᓚ, ᐃᖅᑐᐊᓚ ᐊᓚᒃ ᒪᖅ
**WINTER:** Mid-November, December, January, February and March

ᐱᖅᓚᒥ: ᐊᐃᑐᖅ, ᒪᐃ ᓴᖅ
**SPRING:** April, May and June

ᑭᐅᔾᒥ: ᔭᓪᐃ ᐊᓚᒃ ᐊᒋᖅ
**SUMMER:** July and August

ᑭᐊᓕᖅᑕᖅ: ᓴᖅᑕᕐᓂ, ᐊᖅᑐᕐᓂ ᖁᓕᓚᓂᖅ-ᓄᐃᒪᓚ
**FALL:** September, October to mid-November

ᖃᐅᔨᓪᓚᐃᔪᖅᑎᑦᑕᖅ ᓇᓴᐅᑎᖅ:
Reference Number: _____

| | Country Food | YES or NO | SEASON WIN | SPR | SUM | FAL | DNK | How often | Usual serving | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ᖃᓪᓗᓈᖅ ᓄᑖᖅ, ᓴᐃᑦᑐᖅ ᖃᓄᐊᕐᔪᐊᖑᓂᖅ)<br>Beluga (fresh, frozen or cooked) | | | | | | | | PO-3 | |
| 2 | ᖃᓪᓗᓈᐱᓂᖅ (ᓂᒃᑯ)<br>Beluga (dried) | | | | | | | | PO-3 | |
| 3 | ᖃᓪᓗᓈᐱᓂᐅᑦ ᑎᖏᑐᓗ<br>Beluga liver | | | | | | | | PO-3 | |
| 4 | ᖃᓪᓗᓈᐱᓂᐅᑦ, ᐅᖅᓯᖏᓗ (ᒥᓯᖅᓴᓐ) -<br>Beluga, blubber (including misirak) | | | | | | | | ᖃᓄᐃᑎᒃ<br>CUP | |
| 5 | ᖃᓪᓗᓈᐅᑦ ᓚᒃᑕᖏᓗ<br>Beluga skin | | | | | | | | PO-3 | |
| 6 | ᓇᖅᓯᖅ ᓄᑖᖅ, ᓴᐃᑦᑐᖅ ᖃᓄᐊᕐᔪᐊᖑᓂᖅ)<br>Seal (fresh, frozen or cooked) | | | | | | | | PO-3 | |
| 7 | ᓇᖅᓯᖅ (ᓂᒃᑯ)<br>Seal (dried) | | | | | | | | PO-3 | |
| 8 | ᓇᖅᓯᐱᓂᐅᑦ ᑎᖏᑐᓗ<br>Seal liver | | | | | | | | PO-3 | |
| 9 | ᓇᖅᓯᐱᓂᐅᑦ ᐅᖅᓯᖏᓗ (ᒥᓯᖅᓴᓐ)<br>Seal fat (including misirak) | | | | | | | | PO-3 | |
| 10 | ᑐᒃᑐᐱᓂᖅ ᓄᑖᖅ, ᓴᐃᑦᑐᖅ ᖃᓄᐊᕐᔪᐊᖑᓂᖅ)<br>Caribou (fresh, frozen or cooked) | | | | | | | | PO-3 | |
| 11 | ᑐᒃᑐᐱᓂᖅ (ᓂᒃᑯ)<br>Caribou (dried) | | | | | | | | PO-3 | |
| 12 | ᓚᒃᑕᖅ<br>Muktuk | | | | | | | | PO-3 | |
| 13 | ᐅᒃᓪᖅ<br>Rabbit | | | | | | | | PO-3 | |
| 14 | ᖃᓪᓗᓈᖅ, ᐊᓪᓚᖓᔪᐊᖅ<br>Whale, Narwhal | | | | | | | | PO-3 | |
| 15 | ᐊᐃᐱᖅ<br>Walrus | | | | | | | | PO-3 | |
| 16 | ᓂᕐᓂᖅ ᐊᓕᓗ ᒥᑎᖅ ᓄᑖᖅ, ᓴᐃᑦᑐᖅ ᖃᓄᐊᕐᔪᐊᖑᓂᖅ)<br>Geese and Ducks (fresh, frozen or cooked) | | | | | | | | PO-3 | |
| 17 | ᓂᕐᓂᖅ ᐊᓕᓗ ᒥᑎᖅ (ᓂᒃᑯᖅ)<br>Geese and Ducks (dried) | | | | | | | | | |
| 18 | ᐊᖏᓕᖅ<br>Ptarmigan | | | | | | | | ᐊᑐᓂᑦ<br>EACH | |

ᖃᐅᔨᓴᓕᐅᕐᓂᖅ ᐊᓯᐅᓂᖅ:
Reference Number: _____

| | ᐃᓄᐃᑦ ᑲᑎᒪᔨᖃᑦᑕᕐᓂᖅ Country Food | ᐊ ᑲᑎᒪᓂᖅ ᐊᐅᒃ YES or NO | ᑲᑎᒪᔨᖃᑦᑕᕐᓂᖅ SEASON | | | | | ᖃᓄᐃᓕᐅᕐᓂᖅ How often | ᑕᐃᒪᐃᓐᓇᖅ ᐱᓕᕆᔨ Usual serving | ᑎᑎᕋᕐᓂᖅ Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | ᑭᑭ WIN | ᑯᐱ SPR | ᐊᐅ SUM | ᑭᑭᐊ FAL | ᐃᓕᓴᕐᓂᖅ DNK | | | |
| 19 | ᐃᖃᓗᒃ ᓴᓪᓚᖅ, ᖁᔭᓐ ᖃᓄᐃᓕᐅᕐᓂᖅ<br>Arctic Char (fresh, frozen or cooked) | | | | | | | | PO-3 | |
| 20 | ᐃᖃᓗᐊᕐᓂ (ᐱᖁᔨ)<br>Arctic Char (dried) | | | | | | | | PO-3 | |
| 21 | ᐃᒪ ᓴᓪᓚᖅ, ᖁᔭᓐ ᖃᓄᐃᓕᐅᕐᓂᖅ<br>Salmon (fresh, frozen or cooked) | | | | | | | | PO-3 | |
| 22 | ᐃᒪ (ᐱᖁᔨ)<br>Salmon (dried) | | | | | | | | PO-3 | |
| 23 | ᑐᑭᓯᐊᓪᓚᑦ ᖃᓄᐊᑐᑐᐃᓐᓇᐊᓪᓚᑦ<br>Wild berries | | | | | | | | ᖃᓪᓗᓂ CUP | |

ᖃᓄᐊ ᐊᐃᑦᑐᖅᓯ ᓂᓗᓂᑦ ᐊᐱᖓᓂᖅ, ᖃᐅᔨᔪᒪᔾᖅᓄᑦ ᓂᓗᓯᐅᖏᓐᓄᑦᑎᓪᓗᑦ ᓂᐅᐊᖑᐃᒋᓂᖅ ᓂᐅᐊᖑᑕᐃᓂᖅᓂᒃ ᓂᖅᓂᒃ ᑕᖅᑭᐅᓯᐅᖏᓐᓂᒃ ᑭᓱᐊᓂ.
For this second part of the food frequency questionnaire, I would like to know if you ate those store-bought foods OVER **THE PAST MONTH** only.

ᐱᒋᐊᕐᑎᓗᒍᖃᐃᐃ ᐸᑲᐃᐊᓂ (ᐊᖏᖑᑎᐅᖏᓐ).
Let's start with **CHICKEN**.

1. ᐸᑲᐃᐊᓂᔪᓯᐅᑦᐱᑦ ᑕᖅᑭᐅᓯᐅᖏᓐᔭᒥ?

1. Did you eat CHICKEN over the past MONTH?

ᓂᕆᖏᐃᐸᑦ, 0-ᓯᐊᔪᐃᐅᓚᖓᒃ ᐊᒃᓯᓗᒍ ᑕᖅᑭᒋᓱᒪᓯᒥ ᐊᒃᒪᓕᓂ ᑭᖑᓂᐊᐅ. ᐊᐃᓗᑎᑦ ᓂᖅᑕᓂᔨᒍᑦ ᐊᓱᐊᓂᑦ.
**If NO, enter zero under the Month column and go to the ne food.**

2. ᐃ ᓯᒍᐱᑦ, ᖃᓂᑎᑦ ᐸᖃᐃᐊᓂᔪᓱᒪᓕᑦ ᑕᖅᑭᐅᓯᐅᖏᓐᔭᒥ?
2. If YES, how often did you eat CHICKEN over the past month?

ᑎᑎᕐᓗᑦ ᑭᑎᓱᒍᑎᓂᑦ ᖃᓄᐃᑦᑐᐃᓂᐅᔪᒪᓕᖑᓐᓄᑦᑎᓪᓗᑦ ᐊᑲᓯᑎᑦᓯᐊᓂᖓᓐᓇᒍᑦ.
**Enter the number(s) under the appropriate columns.**

3. ᖃᑦᓱᓂᒃ ___ (ᐃᓕᓴᐃᓂᕐᔪᓂᒃ, ᐃᑭᐊᑎᓱᒪᓕᐊᓂᒃ, ᐃᒥᐅᑎᓂᒃ)
3. How many .... (pieces, slices, glasses, etc.) did you have as your usual serving?

ᓄᓇᐅᑎᒪᔨᖏᑐᒃ ᑎᑎᕐᓗᒍ ᐊᑕᓂ "ᑕᐃᒪᓕᖓᓐᓄᑦ ᓱᓕᒃ ᓯᐊᒥ.
**Enter the number(s) under the "Usual Serving" column.**

| ᓂᐅᐊᖑᐃᓂᐅᓴᐃᑦ ᓂᖅᑭᑦ ᐃᒥᒃᓴᐃᓕᓴᐅᓕᑦ<br>**Store Food or Beverage** | ᖃᓄᐃᓕᐊᑎᒥᐊᖓ ᓂᓱᓕᔪᑦᑕᑦ<br>How often did you eat... | | | ᐃᒪᐃᓕᔪᐊᑎᒥᒃ<br>Usual Serving | ᐅᖃᐅᓯᓴᐃᑦ<br>Comments |
|---|---|---|---|---|---|
| | ᑐᓕᖓ<br>Day | ᐱᓕᓱᐊᖑᓂᖓ<br>Week | ᑕᖅᑭᖓ<br>Month | | |
| 24 ᐊᖅᑭᑎᐅᔭᖓ (ᖃᓪᓕᒃᓴᓂ, ᓂᐅ ᑕᒪᖅᓱᒍ)<br>Chicken (breast, leg or whole) | | | | ᐊᐃᓐᓱᒪᓕᐊᖓ<br>piece | |
| 25 ᓴᐃᖓ ᓴᖑᔭᓐᓱᒪᓕᐊᖓ ᐊᖅᑭᑎᐅᔭᖓ<br>(ᐃᓕᒥᖏᓐᔪᒍ, ᓱᓕᐃᑕ)<br>Frozen fried breaded chicken<br>(ex: Flamingo, Schneiders) | | | | ᐊᐃᓐᓱᒪᓕᐊᖓ<br>piece | |
| 26 ᔪᐅᔪᓱᐃᓂᖓ<br>Pork chops | | | | ᐊᐅᒍᓱᒪᓕᐊᖓ<br>chop | |
| 27 ᐅᓱᔭᖓ<br>Wieners | | | | ᖃᑦᓱᓂᐅ<br>piece | |
| 28 ᐃᑭᐊᒥᓕᓂᖓ, ᓴᓚᒍᓐᓇᐅ (ᑭᒡᐅ, ᓴᓇᓚ)<br>Luncheon meats, canned (Klik, Prem) | | | | ᓴᓚᒍᓐᓇᐅ<br>can | |
| 29 ᐃᑭᐊᒥᓕᓂᖓ, ᓴᖑᓕᓐᑎᓱᒪᓕᐊᖓ<br>Luncheon meats, sliced | | | | ᖃᑦᓱᓂᐅ<br>slice | |
| 30 ᐱᓐᓂᓱᑦ, ᓴᓚᒍᓐᓇᕐᒥᖓ<br>Baked beans, canned | | | | ᓴᓚᒍᓐᓇᐅ<br>can | |
| 31 ᓂᖅᑐᐃᓐᓇᐃᑦ ᓴᓚᒍᓐᓇᕐᒥᖓ<br>Canned beef stew | | | | ᓴᓚᒍᓐᓇᐅ<br>can | |

ᖃᐅᔨᓪᓕᐅᑎᖏᑦ ᓇᓴᐅᑎᖏᑦ:
Reference Number: _____

| ᓄᐅᕐᕕᖏᓐᓄᑦ ᓄᑭᑦ ᐃᒥᒃᖏᐃᓐᓇᓂᑦ<br>Store Food or Beverage | ᖃᓄᖅᓴᐃᑎᒥᐅᑦ ᓄᓇᕗᒻᒧᑦ<br>How often did you eat... | | | ᐃᓚᐃᓐᓄᐊᑎᒥᑦ<br>Usual Serving | ᐅᖃᐅᓯᖏᐃᓐᓇᑦ<br>Comments |
|---|---|---|---|---|---|
| | ᑐᓂᖅ<br>Day | ᐱᓕᕆᔨᖅ<br>Week | ᑕᖃᖅ<br>Month | | |
| | | | | | |
| 32 ᐊᖏᖅ ᒥᑭᓪᓗᑦ<br>ᐊᒃᑭᓪᓗᑦ<br>Pizza small<br>large | | | | __ CL ᖁᒪᑦ<br>__ ᐊᐱᐅᓯᒪᓪᓗᑦ<br>__whole<br>__ wedge | |
| 33 ᐃᓕᓴᐅᒃᑯᑦ ᓄᑭᑦ ᖁᐊᖅ ᐄᐊᖅᓚᖓ ᐊᑕᐅᓴᐅᓂᖓᓪᓗᑦ<br>Ground beef or frozen hamburger patties | | | | ᐊᑕᐅᓴᖅ<br>patty | |
| 34 ᔪᐊᑦ ᐊᐢ<br>Corned beef | | | | PO-3 | |
| 35 ᑎ->ᓐ ᓴᑕᐃᑦ<br>T-Bone steaks | | | | ᓴᑕᐃᑦ<br>steak | |
| 36 ᖁᓕᓪᓚᕆᔨᑎᒍᖅ ᓵᒪᐱᓂᖅ<br>Canned pink salmon | | | | ᖁᓕᓪᓚᕆᑦ<br>can | |
| 37 ᐃᖃᓗᐊᐱᑦ ᖁᓕᓪᓚᕆᔨᑎᒍᑦ (ᐅᖅᓴᕐᐃᐃᓐ)<br>Canned sardines (ex: Brunswick) | | | | ᖁᓕᓪᓚᕆᑦ<br>can | |
| 38 ᖁᔪᖅ ᐃᖃᓗᔪᑕᑦ ᐊᒥᓕᑐᑦ<br>Frozen fish sticks | | | | ᐊᑕᐅᓴᖅ<br>stick | |
| 39 ᐱᓇᑦ ᐸᑕ<br>Peanut butter | | | | ᖃᓗᖁᑎᒃ<br>spoon | |
| 40 ᓴᓴ ᐃᑭᐊᑎᕐᓚᓪᓕᑦ<br>Cheese slices | | | | ᐊᑕᐅᓴᖅ<br>slice | |
| 41 ᓴᓴ, ᓴᑕᖅ<br>Cheese, cheddar | | | | ᐊᑕᐅᓴᖅ<br>slice | |
| 42 ᒪᓐᓂᑦ<br>Eggs | | | | ᐊᑕᐅᓴᖅ<br>egg | |
| 43 ᐸᓂᖅᑎᑕᖅ<br>Bannock | | | | ᐊᐱᐅᓯᒪᓪᓗᑦ<br>piece | |
| 44 ᓂᐊᖅᔨᓐᓄᖅ, ᖃᔪᖅᑕᖅ<br>Bread, white | | | | ᐊᑕᐅᓴᖅ<br>slice | |
| 45 ᓂᐊᖅᔨᓐᓄᖅ, ᑲᓪᓄᖅ<br>Bread, whole wheat | | | | ᐊᑕᐅᓴᖅ<br>slice | |
| 46 ᒪᓇᕐᓂ ᐊᖏᓗ ᓴᓴᓕᐅ<br>Macaroni and cheese dinner<br>(ex: Kraft Dinner ) | | | | PO-3 | |
| 47 ᐅᐊᖅᒥᐊᖅ<br>Oatmeal | | | | PO-3 | |
| 48 ᖃᐃᑦ, ᒪᓇᕐᓂ ᐊᖏᓗ ᓴᐱᒪᑎ<br>Rice, macaroni and spaghetti | | | | PO-3 | |
| 49 ᑲᐃᐅ, ᑐᓇᖅ ᐊᖏᒪ ᐸᐃᖅ<br>Cakes, donuts and pies | | | | ᐊᑕᐅᓴᖅ<br>piece | |

ᖃᐅᔨᓴᓕᐅᑎᖏᑦ ᐃᓕᐅᑎᖏᑦ:
**Reference Number:** _____

| ᓂᐅᐱᖃᓐᓇᕆᐊᖃᑦ ᓂᖅᑭᑦ ᐃᒥᒃᖏᐱᓐᓇᓂᑦ<br>**Store Food or Beverage** | ᖃᓄᖅᓴᐃᑎᒥᔪᖅ ᓂᓕᔪᓐᓇᑐᑦ…<br>How often did you eat... | | | ᐃᓚᐃᓐᓄᐊᑐᑦ<br>Usual Serving | ᐅᖃᐅᔨᖏᖅᐱᑦ<br>Comments |
|---|---|---|---|---|---|
| | ᑭᓐᓄ<br>Day | ᐱᓕᕆᔨᖅ<br>Week | ᑕᖅᑭᖅ<br>Month | | |
| 50 ᖃᖅᔨᐊᓗᒃ ᔨᑎᓴᖅ<br>Pilot biscuits | | | | ᐊᑕᐅᔨᖅ<br>biscuit | |
| 51 ᖃᖅᔨᐊᓗᓄᐱᑦ<br>Cookies | | | | ᐊᒥᐅᔨᖅ<br>cookie | |
| 52 ᐃᒥᒐᖅ (ᑯᑲᔪᓴᖏᑐᖅ, 7-ᐊᖏ)<br>Pop (ex: Coke, 7-UP) | | | | ᐃᒥᑭᑎᒃ<br>glass | |
| 53 ᑕᒃ ᐃᓱᒪᓂᐊᓕᒃ<br>Tang | | | | ᐃᒥᑭᑎᒃ<br>glass | |
| 54 ᐊᐅ ᐃᒥᒐᖅ ᐅᖏᓐᓄᓕᓚᓂᑦ ᐃᒥᒐᖅ, ᖃᐅᖅ<br>Pure apple or orange juice, frozen (ex: McCain) | | | | ᐃᒥᑭᑎᒃ<br>glass | |
| 55 ᑐᓂᓴᓗ ᑐᖃᐃ (ᐊᖏᖅᖃᒥ ᓂᓕᔪᐅᒍ<br>French fries (eaten at home) | | | | PO-3 | |
| 56 ᐸᑎᓴᑦ, ᓄᑦᑦ, ᖁᓚᒪᔪᖅ<br>Potato chips | | | | ᐊᑕᐅᔨᖅ<br>200 g bag | |
| 57 ᑲᓇᐃᓴᓴᓴᓗᓴ ᐸᓂᑐᑦ ᐅᖏᑎᑦ<br>Carnation/Shiriff mashed potatoes | | | | PO-3 | |
| 58 ᐸᑎᓴᑦ, ᓄᑦᖅ, ᖁᓚᒪᔪᖅ<br>Potatoes, fresh, cooked | | | | ᐊᑕᐅᔨᖅ<br>potato | |
| 59 ᑲᐅᓂᑦ (ᓄᑦᖅ/ᖏᓪᓗᒪᔪᓴ/ᖏᑦᖅ)<br>Carrots (fresh/canned/frozen) | | | | PO-3 | |
| 60 ᖏᓪᓗᒪᔪᓱᑎᑐᖅ, ᑐᒪᐃᑐᑦ<br>Canned tomatoes | | | | PO-3 | |
| 61 ᖏᓪᓗᒪᔪᓱᑎᑐᖅ ᑯᐊᑦ ᐱᑭᑐᐃᓂᖅ<br>Canned corn | | | | PO-3 | |
| 62 ᔨᖏᓄᐃᑦ ᖏᓪᓗᒪᔪᓱᑎᑐᖅ<br>Canned fruits | | | | ᖁᑦᓗᑎᒃ<br>cup | |
| 63 ᔨᖏᓄᖅ ᓄᑦᖅ ᐊᐅᓴᖏᑐᖅ, ᐸᓇᐅᓇᓂᓗ<br>Fresh fruits (ex: apples, bananas) | | | | ᐊᑕᐅᔨᖅ<br>fruit | |
| 64 ᐳᓴᓂᖅ (ᐊᑕᐅᔨᐃᓴᔨᒍ ᒥᔨᓴᔨᖅᓄᓴᓂᖏᖅ<br>Lard (as a spread or a dip) | | | | ᖁᓗᖏᑎᑐᐃᓕᓴᒃ<br>tbsp | |
| 65 ᑎᒥ ᐊᓴᒪᓗ ᑲᐱᒥ, ᖁᓇᐃᖏᑐᒃ ᐃᓪᓗᒥᒃ ᐊᑐᖁᑦᑕᖏᑦ?<br>**In tea and coffee, what kind of milk do you usually use?** | | | | | |
| ᐃ. ᓄᑦᖅ ᐃᓪᓗᒃ<br>a. Fresh whole milk | | | | ᖁᓗᖏᑎᑐᐃᓕᓴᒃ<br>tbsp | |
| ᐸ. ᓄᑦᑦ 2% ᐃᓪᓗᒃ/ᐸᓂᑐᖅ<br>b. Fresh 2% milk/UHT milk (Grand Pré) | | | | ᖁᓗᖏᑎᑐᐃᓕᓴᒃ<br>tbsp | |
| ᑕ. ᐸᓂᑐᖅ ᐃᓪᓗᒃ (ᑲᓇᑕ ᐳᐊᐃ)<br>c. Powdered whole milk (Canada Boy) | | | | ᖁᓗᖏᑎᑐᐃᓕᓴᒃ<br>tbsp | |

ᖃᐅᔨᒪᓂᐅᕐᓂᖅ ᐃᓕᐅᑎᓪᓗᒍ:
**Reference Number:** _____

| ᓂᐅᐊᖑᐊᓂᖅᐳᐃᑦ ᓂᕆᑦ ᐃᒥᒃᖏᐃᓐᓇᖅᑐᑦ<br>**Store Food or Beverage** | ᖃᓄᖏᖅᑐᐃᒥᕐᕕᒃ ᓂᓪᓕᖅᑐᑦ...<br>How often did you eat... | | | ᐃᒪᐃᓐᓇᐅᑎᒥᑦ<br>Usual Serving | ᐅᖃᐅᓯᖏᓐᓇᐃᑦ<br>Comments |
|---|---|---|---|---|---|
| | ᑐᓐᓇᖅ<br>Day | ᐱᓕᕆᔨᒃᑯᖅ<br>Week | ᑕᖅᑭᖅ<br>Month | | |
| b. ᑮᓂᑎᖅ ᐃᒃᓗᐊᖅ (ᑲᓇᐃᓴᖅ)<br>d. Powdered skim milk (Carnation) | | | | ᖃᓄᖅᑎᑦᑎᐊᖅ<br>tbsp | |
| ᒪ. ᑭᓂᑎᖅ ᐃᒃᓗᐊᖅ, ᑲᑭᐊᖅᑎᑦ<br>e. Evaporated milk, diluted | | | | ᖃᓄᖅᑎᑦᑎᐊᖅ<br>tbsp | |
| L ᑭᓂᑎᖅ ᐃᖅᓯᖅ, ᐃᓕᓴᕐᕕᒋᑦ<br>f. Evaporated milk, undiluted | | | | ᖃᓄᖅᑎᑦᑎᐊᖅ<br>tbsp | |
| ᓇ ᐃᒃᓗᒍᐊᖅ ᑲᐱᒪᐃᑦ<br>g. Coffeemate | | | | ᖃᓄᖅᑎᑦᑎᐊᖅ<br>tbsp | |
| ᓴ ᑎᑐᓴᖅᑭᖅ ᑲᐱᒋᔭᐅᑦ<br>h. do not drink tea nor coffee | | | | | |
| ᓭ ᐃᒃᑐᑐᓴᖅᑭᖅ ᕿᓂᑎᒋᔭᐅᑦ<br>i do not use milk nor cream | | | | | |
| 66 ᐅᓪᓗᕈᓘᓴᖅᑎᒋᔭᖅ, ᖃᓄᐃᑎᒥᐅ ᐃᒃᓚᓕᓴᕐᕕᐊᓪ?<br>**On cereals, what kind of milk do you usually use?** | | | | | |
| ᐊ. ᓄᑖᒥᐅ ᐃᒃᓚᒥᐅ<br>a. Fresh whole milk | | | | ᐃᒥᕆᑎᐅ<br>glass | |
| ᐸ. ᓄᑖᖅ 2% ᐃᒃᓗᐅ<br>b. Fresh 2% milk/UHT milk (Grand Pré) | | | | ᐃᒥᕆᑎᐅ<br>glass | |
| C ᑮᓂᑎᖅ ᐃᒃᓗᐅ (ᑲᓇC ᐳᐊᐃ)<br>c. Powdered whole milk (Canada Boy) | | | | ᐃᒥᕆᑎᐅ<br>glass | |
| b. ᑮᓂᑎᖅ ᐃᒃᓗᐅ (ᑲᓇᐃᓴᖅ)<br>d. Powdered skim milk (Carnation) | | | | ᐃᒥᕆᑎᐅ<br>glass | |
| ᒪ. ᑭᓂᑎᖅ ᐃᒃᓗᐅ, ᑲᑭᐊᖅᑎᑦ<br>e. Evaporated milk, diluted | | | | ᐃᒥᕆᑎᐅ<br>glass | |
| L ᑭᓂᑎᖅ ᐃᖅᓯᖅ, ᐃᓕᓴᕐᕕᒋᑦ<br>f. Evaporated milk, undiluted | | | | ᐃᒥᕆᑎᐅ<br>glass | |
| ᓇ ᐅᓪᓗᕈᓘᑎᒋᔭᖅᑭᖅ<br>g. do not eat cereals | | | | | |
| 67 ᐃᒥᓕᖓᓕᒫᓄᑦ, ᓄᓇᒥᐅ ᐃᒥᓄᓴᕐᕕᐊᓪ?<br>**As a drink, what kind of milk do you usually drink?** | | | | | |
| ᐊ. ᓄᑖᒥᐅ ᐃᒃᓚᒥᐅ<br>a. Fresh whole milk | | | | ᐃᒥᕆᑎᐅ<br>glass | |
| ᐸ. ᓄᑖᖅ 2% ᐃᒃᓗᐅ ᐊᔪᖅ ᐳᓗᒍ<br>b. Fresh 2% milk/UHT milk (Grand Pré) | | | | ᐃᒥᕆᑎᐅ<br>glass | |
| C ᑮᓂᑎᒥᐅ ᐃᒃᓚᒥᐅ (ᑲᓇC ᐳᐊᐃ)<br>c Powdered whole milk (Canada Boy) | | | | ᐃᒥᕆᑎᐅ<br>glass | |
| b. ᑮᓂᑎᒥᐅ ᐃᒃᓚᒥᐅ ᐅᓴᓗᐅᑲᖓᑎᒋᑦ (ᑲᓇᐃᓴᖅ)<br>d. Powdered skim milk (Carnation) | | | | ᐃᒥᕆᑎᐅ<br>glass | |

ᖃᐅᔨᒪᓇᐅᑎᖓᓱᒃ ᓇᓴᐅᑎᖓ:
**Reference Number:** _____

| ᓂᐅᐱᕐᐃᓂᖅᐳᑦ ᓂᕆᑦ ᐃᒥᒃᖏᐃᓐᓇᓕᒃ<br>**Store Food or Beverage** | ᖃᓄᖏᖅᐃᑎᒋᔭᖅ ᓂᓚᕐᔪᑐᑦ...<br>How often did you eat... | | | ᐃᒪᐃᓐᓇᐊᑐᒥᒃ<br>Usual Serving | ᑲᖃᐅᓕᖏᓐᓇᐃᑦ<br>Comments |
|---|---|---|---|---|---|
| | ᑲᓐᓇᖅ<br>Day | ᐱᓇᓕᐊᕈᓕᖅ<br>Week | ᑕᖅᖅ<br>Month | | |
| ᒃ. ᐃᓕᓴᕐᕿᐃᑦ ᐃᒃᓗᑎ, ᑲᑭᐊᓐᑐᖅ<br>e. Evaporated milk, diluted | | | | ᐃᒥᒋᑎᒃ<br>glass | |
| ᒪ ᐃᓕᓴᕐᕿᐃᑦ ᐃᒃᓗᑎ, ᕿᓂᖅᑐᖅ<br>f. Evaporated milk, undiluted | | | | ᐃᒥᒋᑎᒃ<br>glass | |
| ᓇ ᐃᒃᒍᑐᓚᓐᓂᖏᑦ ᕿᓂᖅᑐᒥᓐᓇᓕᒃ<br>g. do not drink milk nor cream | | | | | |

# APPENDIX 4

# LIST OF BASE FOODS

# Data from the Santé Québec Inuit Nutrition Survey

## PART I

J. N. Thompson Ph. D. & Danielle Brulé Ph. D.

Nutrition Research Division
Food Directorate
Health Protection Branch
Ottawa

| A | B | C | D |
|---|---|---|---|
| 3714 | 1 | 1A | PATE, MACARONI (COUDES), SEC |
| 3731 | 1 | 1A | PATE, MACARONI (COUDES), ENRICHI, SEC |
| 3732 | 1 | 1A | PATE, MACARONI (COUDES), ENRICHI, CUIT |
| 3738 | 1 | 1A | PATE, NOUILLES AUX OEUFS, ENRICHIES, CUITES |
| 3742 | 1 | 1A | PATE, SPAGHETTI, ENRICHI, CUIT |
| 3653 | 2 | 1B | GRAIN CEREALIER, RIZ BRUN, GRAIN LONG, CUIT |
| 3705 | 2 | 1B | GRAIN CEREALIER, RIZ BLANC, GRAIN LONG, ORDINAIRE, CRU |
| 3706 | 2 | 1B | GRAIN CEREALIER, RIZ BLANC, GRAIN LONG, ORDINAIRE, CUIT |
| 3708 | 2 | 1B | GRAIN CEREALIER, RIZ BLANC, GRAIN LONG, A L'ETUVEE, CUIT |
| 3709 | 2 | 1B | GRAIN CEREALIER, RIZ BLANC, GRAIN MOYEN, CRU |
| 3710 | 2 | 1B | GRAIN CEREALIER, RIZ BLANC, GRAIN MOYEN, CUIT |
| 3718 | 2 | 1B | GRAIN CEREALIER, RIZ BLANC, GRAIN LONG, P-A-S, ENRICHI, SEC |
| 3719 | 2 | 1B | GRAIN CEREALIER, RIZ BLANC, GRAIN LONG, P-A-S, ENRICHI, PREP |
| 3639 | 3 | 1C | GRAIN CEREALIER, MAIS, FARINE DE (JAUNE), GRAIN ENTIER |
| 3644 | 3 | 1C | GRAIN CEREALIER, MAIS, FECULE DE |
| 3649 | 3 | 1C | GRAIN CEREALIER, AVOINE, SON DE, CRU |
| 3668 | 3 | 1C | GRAIN CEREALIER, TAPIOCA, PERLE, SEC |
| 3677 | 3 | 1C | GRAIN CEREALIER, BLE, SON DE, BRUT |
| 3679 | 3 | 1C | GRAIN CEREALIER, BLE, FARINE DE, GRAIN ENTIER |
| 3720 | 3 | 1C | GRAIN CEREALIER, BLE, FARINE DE, BLANCHE, TOUT USAGE |
| 3722 | 3 | 1C | GRAIN CEREALIER, BLE, FARINE DE, BLANCHE, FARINE A PAIN |
| 3723 | 3 | 1C | GRAIN CEREALIER, BLE, FARINE DE, BLANCHE, FARINE A GATEAU |
| 3724 | 3 | 1C | GRAIN CEREALIER, BLE, FARINE DE, BLANCHE, PREP POUR TORTILLA |
| 27 | 4 | 2A | PAIN, FRANCAIS OU VIENNOIS |
| 34 | 4 | 2A | PAIN, BLANC, (1% A 2% POUDRE DE LAIT ECREME), GRILLE |
| 423 | 4 | 2A | PAIN, BLANC, (1% A 2% POUDRE DE LAIT ECREME) |
| 424 | 4 | 2A | PAIN, BLANC, (3% A 4% POUDRE DE LAIT ECREME) |
| 38 | 5 | 3A | PAIN, DE BLE ENTIER, FAIT AVEC DE L'EAU, GRILLE |
| 427 | 5 | 3A | PAIN, DE BLE ENTIER, FAIT AVEC DE L'EAU |
| 30 | 7 | 4A | PAIN, AUX RAISINS |
| 31 | 7 | 4A | PAIN, AUX RAISINS, GRILLE |
| 39 | 7 | 4A | PAIN, CHAPELURE, SECHE, EMIETTEE |
| 347 | 7 | 4A | PAINS, PETITS, COMM, PRETS A SERVIR, DURS (CROUTES) |
| 348 | 7 | 4A | PAINS, PETITS, COMMERCIAL, NATURE, HOT-DOG/HAMBOURGEOIS |
| 198 | 8 | 4B | CRAQUELINS, AU FROMAGE |
| 204 | 8 | 4B | CRAQUELINS, SODA |
| 205 | 8 | 4B | CRAQUELINS, DE BLE ENTIER |
| 453 | 8 | 4B | CRAQUELINS, BISCUITS PILOTE DE PENICHE |
| 4108 | 8 | 4B | CRACKERS; TOAST THINS (RYE, WHEAT, WHITE FLOUR) |
| 4188 | 8 | 4B | CRACKERS; SALTINES, LOW SODIUM |
| 11800 | 8 | 4B | CRAQUELINS, FEUILLETES (MARVEN'S) |
| 11807 | 8 | 4B | CRAQUELINS, CREAM CRACKERS (PURITY) |
| 399 | 10 | 4D | GAUFRES, CONGELEES |
| 41 | 12 | 4F | PAIN PREPARATION POUR FARCE, SEC |
| 80 | 12 | 4F | GATEAU, PREP POUR, DU DIABLE, SEC |
| 84 | 12 | 4F | GATEAU, PREP POUR, MIEL ET EPICES, SEC |
| 88 | 12 | 4F | GATEAU, PREP POUR, BLANC, SEC |
| 90 | 12 | 4F | GATEAU, PREP POUR, DORE, SEC |
| 265 | 12 | 4F | CREPES ET GAUFRES, PREP POUR, NATURE/BABEURRE, SEC |
| 446 | 12 | 4F | SHAKE AND BAKE, SEC |
| 4048 | 12 | 4F | BREADING FOR BAKED OR FRIED CHICKEN |
| 1517 | 13 | 5A | CEREALE, GRUAU, REGULIER/RAPIDE/1 MINUTE, SEC |
| 1518 | 13 | 5A | CEREALE, GRUAU, REGULIER/RAPIDE/1 MINUTE, CUIT |
| 1546 | 13 | 5A | CEREALE, PRETE A MANGER, RAISIN BRAN |
| 1577 | 13 | 5A | CEREALE, PRETE A MANGER, SHREDDED WHEAT, GROS BISCUIT |

| A | B | C | D |
|---|---|---|---|
| 1581 | 13 | 5A | CEREALE, PRETE A MANGER, BRAN FLAKES, KELLOGG'S |
| 11727 | 13 | 5A | CEREALE, PRETE A MANGER, SHREDDED WHEAT'N BRAN, SPOON SIZE |
| 1509 | 14 | 6A | CEREALE, PRETE A MANGER, GRANOLA, MAISON |
| 1525 | 14 | 6A | CEREALE, PRETE A MANGER, CHEERIOS |
| 1529 | 14 | 6A | CEREALE, PRETE A MANGER, CORN FLAKES |
| 1533 | 14 | 6A | CEREALE, PRETE A MANGER, MINI-WHEATS, GIVRES |
| 1535 | 14 | 6A | CEREALE, PRETE A MANGER, FRUITY PEBBLES |
| 1548 | 14 | 6A | CEREALE, PRETE A MANGER, RICE KRISPIES |
| 1550 | 14 | 6A | CEREALE, PRETE A MANGER, SPECIAL K |
| 1551 | 14 | 6A | CEREALE, PRETE A MANGER, CORN POPS |
| 1552 | 14 | 6A | CEREALE, PRETE A MANGER, FROSTED FLAKES |
| 1554 | 14 | 6A | CEREALE, PRETE A MANGER, SUGAR CRISP |
| 1637 | 14 | 6A | CEREALE, PRETE A MANGER, JUST RIGHT |
| 1640 | 14 | 6A | CEREALE, PRETE A MANGER, MUSLIX-FIVE-GRAIN |
| 11726 | 14 | 6A | CEREALE, PRETE A MANGER, RAISIN WHEATS |
| 11729 | 14 | 6A | CEREALE, PRETE A MANGER, APPLE & CINNAMON WHEATS |
| 11812 | 14 | 6A | CEREALE, PRETE A MANGER, CHEERIOS, POMME ET CANNELLE |
| 166 | 15 | 7A | BISCUITS, AU CHOCOLAT |
| 174 | 15 | 7A | BISCUITS, A L'AVOINE AVEC RAISINS SECS |
| 176 | 15 | 7A | BISCUITS, AUX RAISINS SECS |
| 177 | 15 | 7A | BISCUITS, SANDWICH |
| 178 | 15 | 7A | BISCUITS, SABLES |
| 181 | 15 | 7A | BISCUITS, GAUFRETTES A LA VANILLE |
| 430 | 15 | 7A | BISCUITS, AUX BRISURES DE CHOCOLAT, COMMERCIAL |
| 443 | 15 | 7A | BISCUITS, A L'AVOINE SANS RAISINS SECS |
| 3904 | 15 | 7A | BISCUITS, THE SOCIAL |
| 433 | 17 | 8A | POP-TARTS |
| 69 | 18 | 8B | GATEAU, CONGELE COMM, DU DIABLE AVEC GLACE AU CHOCOLAT |
| 536 | 20 | 9A | CREME GLACEE A LA VANILLE, FERME, 10% M.G. |
| 600 | 23 | 10A | LAIT, ENTIER, LIQUIDE, HOMOGENEISE, PASTEURISE, 3,3% M.G. |
| 547 | 24 | 10B | LAIT, PARTIELLEMENT ECREME, LIQUIDE, 2% M.G. |
| 585 | 26 | 10D | LAIT, POUDRE DE, ECREME |
| 593 | 26 | 10D | LAIT, ECREME, LIQUIDE |
| 594 | 26 | 10D | LAIT, POUDRE DE, ECREME, INSTANTANE |
| 614 | 27 | 10E | LAIT, CONCENTRE, ENTIER, EN CONSERVE, NON DILUE, 7,8% M.G. |
| 555 | 30 | 10H | LAIT, CONCENTRE, SUCRE, EN CONSERVE |
| 552 | 31 | 10I | BABEURRE, DE CULTURE, LIQUIDE |
| 553 | 31 | 10I | LAIT, POUDRE DE, ENTIER |
| 534 | 32 | 13A | CREME, GARNITURE FOUETTEE, SOUS PRESSION (EN BOMBE) |
| 612 | 32 | 13A | CREME A FOUETTER, 35% M.G. |
| 610 | 33 | 13B | CREME A CAFE (DE TABLE), 18% M.G. |
| 622 | 34 | 13C | CREME A CEREALES (MOITIE-MOITIE), 10% M.G. |
| 613 | 35 | 13D | CREME SURE, DE CULTURE, 14% M.G. |
| 506 | 36 | 14A | FROMAGE COTTAGE (2% M.G.) |
| 4170 | 37 | 14B | CHEESE; AMERICAN, PROCESSED, LOW FAT |
| 4212 | 37 | 14B | CHEESE; AMERICAN, PROCESSED, LOW FAT, LOW SODIUM |
| 11704 | 37 | 14B | FROMAGE, REDUIT EN CALORIES (6% M.G.) |
| 514 | 38 | 14C | FROMAGE MOZZARELLA (48% D'HUMIDITE; 25% M.G.) |
| 515 | 38 | 14C | FROMAGE MOZZARELLA, PART ECREME (49% EAU, 17% M.G.) |
| 584 | 38 | 14C | FROMAGE, FONDU A TARTINER, CHEDDAR |
| 590 | 38 | 14C | FROMAGE MOZZARELLA, PART ECREME (52% EAU, 16,5% M.G.) |
| 497 | 39 | 14D | FROMAGE BRICK |
| 498 | 39 | 14D | FROMAGE BRIE |
| 507 | 39 | 14D | FROMAGE A LA CREME |
| 518 | 39 | 14D | FROMAGE PARMESAN, RAPE |

| A | B | C | D |
|---|---|---|---|
| 526 | 39 | 14D | FROMAGE SUISSE (EMMENTALER) |
| 528 | 39 | 14D | FROMAGE, FONDU, CHEDDAR |
| 592 | 39 | 14D | FROMAGE CHEDDAR |
| 615 | 41 | 15B | YOGOURT, NATURE, 2% -> 4% M.G. |
| 620 | 41 | 15B | YOGOURT, FRUITS AU FOND, 2% -> 4% M.G. |
| 570 | 42 | 16A | OEUF DE POULE, BLANC, FRAIS OU CONGELE, CRU |
| 601 | 42 | 16A | OEUF DE POULE, ENTIER, FRAIS OU CONGELE, CRU |
| 602 | 42 | 16A | OEUF DE POULE, JAUNE, FRAIS, CRU, + PETITE QUANTITE DE BLANC |
| 605 | 42 | 16A | OEUF DE POULE, ENTIER, BOUILLI A LA COQUE, DUR |
| 581 | 44 | 17A | BEURRE, NON SALE |
| 599 | 44 | 17A | BEURRE SALE |
| 900 | 45 | 18A | MARGARINE, MOLLE, HUILE DE SOJA |
| 903 | 45 | 18A | MARGARINE, MOLLE, HUILES VEGETALES NON PRECISEES |
| 920 | 45 | 18A | MARGARINE, MOLLE, TOURNESOL+HUILE VEG N PREC,INTERESTERIFIEE |
| 902 | 46 | 18B | MARGARINE, MOLLE, HUILE VEGETALE NON PRECISEE, HYPOCALORIQUE |
| 904 | 47 | 20A | MARGARINE, BATONNETS OU PAIN, HUILES VEGETALES N PRECISEES |
| 931 | 47 | 20A | MARGARINE, BATONNETS OU PAIN, HUILES VEGETALE/POISSON/PALME |
| 862 | 48 | 21A | HUILE VEGETALE, SOJA |
| 865 | 48 | 21A | HUILE VEGETALE, OLIVE |
| 866 | 48 | 21A | HUILE VEGETALE, PALMIER |
| 868 | 48 | 21A | HUILE VEGETALE, TOURNESOL, MOINS DE 60% D'ACIDE LINOLEIQUE |
| 874 | 48 | 21A | HUILE VEGETALE, COTON |
| 875 | 48 | 21A | HUILE VEGETALE, TOURNESOL, 60% OU PLUS D'ACIDE LINOLEIQUE |
| 877 | 48 | 21A | HUILE VEGETALE, CARTHAME, 70% OU PLUS D'ACIDE OLEIQUE |
| 881 | 48 | 21A | HUILE VEGETALE, MAIS |
| 894 | 48 | 21A | HUILE VEGETALE, CANOLA (COLZA) |
| 455 | 49 | 21B | PHOQUE, HUILE |
| 857 | 49 | 21B | GRAS ANIMAL, BOEUF, GRAISSE FONDUE (SUIF) |
| 889 | 49 | 21B | GRAS ANIMAL, POULET |
| 891 | 49 | 21B | GRAS ANIMAL, DINDE |
| 897 | 49 | 21B | GRAS ANIMAL, SAINDOUX |
| 984 | 49 | 21B | POULET A GRILLER/FRIRE, GRAS DETACHABLE, CRU |
| 3963 | 49 | 21B | GIBIER, PHOQUE ANNELE, GRAS (BLUBBER), CRU |
| 3964 | 49 | 21B | GIBIER, PHOQUE ANNELE, GRAS, FERMENTE, LIQUIDE |
| 3966 | 49 | 21B | GIBIER, PHOQUE ANNELE, GRAS, BOUILLI |
| 3983 | 49 | 21B | GIBIER, OURS POLAIRE, GRAS, BOUILLI |
| 3986 | 49 | 21B | GIBIER, CARIBOU, GRAS, CRU |
| 3998 | 49 | 21B | BELUGA, MUKTUK (PEAU + GRAS), CRU |
| 921 | 50 | 21C | SHORTENING, DOMESTIQUE, HUILES VEGETALE+ANIMAL NON PRECISEES |
| 928 | 50 | 21C | SHORTENING, INDUSTRIEL, TOUT USAGE, SOJA ET PALME |
| 11710 | 50 | 21C | SHORTENING, DOMESTIQUE, HUILE VEGETALE NON PRECISEE |
| 2801 | 51 | 22A | BOEUF, EPAULE, ROTI DE COTES CROISEES, MAIGRE,1/4",CRUE |
| 2826 | 51 | 22A | BOEUF, EPAULE, HAUT-DE-COTES, MAIGRE, MIJOTE |
| 2842 | 51 | 22A | BOEUF, LONGE, BIFTECK D'ALOYAU GROS FILET,MAIGRE,1/4",GRILLE |
| 2866 | 51 | 22A | BOEUF, CUISSE, ROTI DE CROUPE, MAIGRE, 1/4" PARE, ROTI |
| 2878 | 51 | 22A | BOEUF, CUISSE, RONDE, ROTI D'INTERIEUR, MAIGRE, 1/4", ROTI |
| 2768 | 52 | 22B | BOEUF, POINTE DE POITRINE, MAIGRE+GRAS, 1/4" PARE, BRAISES |
| 2820 | 52 | 22B | BOEUF, COTE, BIFTECK DE COTE, MAIGRE+GRAS, 1/4" PARE,GRILLES |
| 2839 | 52 | 22B | BOEUF, LONGE, BIFTECK D'ALOYAU GROS FILET, M+G, 1/4",CRUS |
| 2840 | 52 | 22B | BOEUF, LONGE, BIFTECK D'ALOYAU GROS FILET, M+G, 1/4",GRILLES |
| 2864 | 52 | 22B | BOEUF, CUISSE, ROTI DE CROUPE, MAIGRE+GRAS, 1/4" PARE, ROTIS |
| 11743 | 52 | 22B | BOEUF, COUPES DIVERSES, MAIGRE+GRAS, 1/4" PARE, CRU |
| 11744 | 52 | 22B | BOEUF, COUPES DIVERSES, MAIGRE+GRAS, 1/4" PARE, CUIT |
| 2774 | 53 | 22C | BOEUF, HACHE, MAIGRE, CRU |
| 2776 | 53 | 22C | BOEUF, HACHE, MAIGRE, CUIT AU FOUR, BIEN CUIT |

| A | B | C | D |
|---|---|---|---|
| 2777 | 53 | 22C | BOEUF, HACHE, MAIGRE, GRILLE, MEDIUM |
| 2778 | 53 | 22C | BOEUF, HACHE, MAIGRE, GRILLE, BIEN CUIT |
| 2781 | 53 | 22C | BOEUF, HACHE, MI-MAIGRE, CRU |
| 2783 | 53 | 22C | BOEUF, HACHE, MI-MAIGRE, CUIT AU FOUR, BIEN CUIT |
| 2784 | 53 | 22C | BOEUF, HACHE, MI-MAIGRE, GRILLE, MEDIUM |
| 2785 | 53 | 22C | BOEUF, HACHE, MI-MAIGRE, GRILLE, BIEN CUIT |
| 2788 | 53 | 22C | BOEUF, HACHE, ORDINAIRE, CRU |
| 2791 | 53 | 22C | BOEUF, HACHE, ORDINAIRE, GRILLE, MEDIUM |
| 2792 | 53 | 22C | BOEUF, HACHE, ORDINAIRE, GRILLE, BIEN CUIT |
| 2004 | 58 | 25A | PORC, FRAIS, LONGE, BOUT DES COTES, MAIGRE, CRU |
| 2008 | 58 | 25A | PORC, FRAIS, LONGE, MILIEU DE, MAIGRE, CRU |
| 2050 | 58 | 25A | PORC, FRAIS, LONGE, ENTIERE, MAIGRE, BRAISE |
| 2051 | 58 | 25A | PORC, FRAIS, LONGE, ENTIERE, MAIGRE, GRILLE |
| 2065 | 58 | 25A | PORC, FRAIS, LONGE, COTE CENTRALE, MAIGRE, CRU |
| 2078 | 58 | 25A | PORC, FRAIS, EPAULE, PICNIC, MAIGRE, BRAISE |
| 11736 | 58 | 25A | PORC, FRAIS, LONGE, COTELETTE COMPOSEE, MAIGRE, CRUE |
| 11738 | 58 | 25A | PORC, FRAIS, LONGE, COTELETTE COMPOSEE, MAIGRE, SAUTEE |
| 11740 | 58 | 25A | PORC, FRAIS, LONGE, COTELETTE COMPOSEE, MAIGRE, ROTIE |
| 2002 | 59 | 25B | PORC, FRAIS, LONGE, BOUT DES COTES, MAIGRE+GRAS, CRUS |
| 2003 | 59 | 25B | PORC, FRAIS, LONGE, BOUT DES COTES, MAIGRE+GRAS, GRILLES |
| 2006 | 59 | 25B | PORC, FRAIS, LONGE, MILIEU DE, MAIGRE+GRAS, CRUS |
| 2022 | 59 | 25B | PORC, FRAIS, COTES LEVEES, MAIGRE+GRAS, CRUS |
| 2023 | 59 | 25B | PORC, FRAIS, COTES LEVEES, MAIGRE+GRAS, BRAISES |
| 2029 | 59 | 25B | PORC, FRAIS, LONGE, COTES LEVEES DE DOS, MAIGRE+GRAS, ROTIS |
| 2046 | 59 | 25B | PORC, FRAIS, LONGE, ENTIERE, MAIGRE+GRAS, BRAISES |
| 2047 | 59 | 25B | PORC, FRAIS, LONGE, ENTIERE, MAIGRE+GRAS, GRILLES |
| 2048 | 59 | 25B | PORC, FRAIS, LONGE, ENTIERE, MAIGRE+GRAS, ROTIS |
| 2061 | 59 | 25B | PORC, FRAIS, LONGE, COTE CENTRALE, MAIGRE+GRAS, CRUS |
| 2063 | 59 | 25B | PORC, FRAIS, LONGE, COTE CENTRALE, MAIGRE+GRAS, GRILLES |
| 2073 | 59 | 25B | PORC, FRAIS, EPAULE, ENTIERE, MAIGRE+GRAS, CRUS |
| 2074 | 59 | 25B | PORC, FRAIS, EPAULE, ENTIERE, MAIGRE+GRAS, ROTIS |
| 11732 | 59 | 25B | PORC, FRAIS, LONGE, COTELETTE COMPOSEE, MAIGRE+GRAS, GRILLEE |
| 11733 | 59 | 25B | PORC, FRAIS, LONGE, COTELETTE COMPOSEE, MAIGRE+GRAS, SAUTEE |
| 11734 | 59 | 25B | PORC, FRAIS, LONGE, COTELETTE COMPOSEE, MAIGRE+GRAS, BRAISEE |
| 11735 | 59 | 25B | PORC, FRAIS, LONGE, COTELETTE COMPOSEE, MAIGRE+GRAS, ROTIE |
| 1946 | 60 | 25C | PORC, SALE, BACON, GRILLE, SAUTE OU ROTI |
| 1464 | 61 | 25D | JAMBON, TRANCHE, TRES MAIGRE (APP 5% DE M.G.) |
| 1971 | 61 | 25D | PORC, SALE, JAMBON DESOSSE, TRANCHE, MAIGRE, NON RECHAUFFEE |
| 1974 | 61 | 25D | PORC, SALE, JAMBON ENTIER, MAIGRE, NON RECHAUFFE |
| 1975 | 61 | 25D | PORC, SALE, JAMBON ENTIER, MAIGRE, ROTI |
| 1992 | 61 | 25D | PORC, SALE, JAMBON DESOSSE, MAIGRE ET REGULIER NON RECHAUFFE |
| 1993 | 61 | 25D | PORC, SALE, JAMBON DESOSSE, MAIGRE ET REGULIER, ROTI |
| 1994 | 61 | 25D | PORC, SALE, JAMBON EN CONSERVE, MAIGRE/REGULIER, N RECHAUFFE |
| 1995 | 61 | 25D | PORC, SALE, JAMBON EN CONSERVE, MAIGRE ET REGULIER,ROTI |
| 1465 | 62 | 25E | JAMBON, TRANCHE, (APP 11% M.G.) |
| 1973 | 62 | 25E | PORC, SALE, JAMBON ENTIER, MAIGRE+GRAS, ROTIS |
| 951 | 63 | 27A | POULET A GRILLER/FRIRE, CHAIR SEULEMENT, ROTIE |
| 952 | 63 | 27A | POULET A GRILLER/FRIRE, CHAIR SEULEMENT, RAGOUT |
| 976 | 63 | 27A | POULET A GRILLER/FRIRE, VIANDE BLANCHE SEULEMENT, CRUE |
| 978 | 63 | 27A | POULET A GRILLER/FRIRE, VIANDE BLANCHE SEULEMENT, ROTIE |
| 982 | 63 | 27A | POULET A GRILLER/FRIRE, VIANDE BRUNE SEULEMENT, ROTIE |
| 990 | 63 | 27A | POULET A GRILLER/FRIRE, VIANDE DE DOS SEULEMENT, CRUE |
| 1002 | 63 | 27A | POULET A GRILLER/FRIRE, POITRINE, VIANDE SEULEMENT, RAGOUT |
| 1009 | 63 | 27A | POULET A GRILLER/FRIRE, PILON, VIANDE SEULEMENT, FRITE |
| 1017 | 63 | 27A | POULET A GRILLER/FRIRE, CUISSE, VIANDE SEULEMENT, CRUE |

| A | B | C | D |
|---|---|---|---|
| 1019 | 63 | 27A | POULET A GRILLER/FRIRE, CUISSE, VIANDE SEULEMENT, ROTIE |
| 1020 | 63 | 27A | POULET A GRILLER/FRIRE, CUISSE, VIANDE SEULEMENT, RAGOUT |
| 1034 | 63 | 27A | POULET A GRILLER/FRIRE, HAUT CUISSE VIANDE SEULEMENT, FRITE |
| 1213 | 63 | 27A | VOLAILLE, PRODUIT DE: POULET EN CONSERVE, DESOSSE, +BOUILLON |
| 1453 | 63 | 27A | POULET, ROULE DE, VIANDE BLANCHE |
| 4041 | 63 | 27A | CHICKEN; BROILERS OR FRYERS, BREAST, MEAT ONLY, FRIED WITHO |
| 4042 | 63 | 27A | CHICKEN; BROILERS OR FRYERS, DRUMSTICK, MEAT ONLY, FRIED, W |
| 4043 | 63 | 27A | CHICKEN; BROILERS OR FRYERS, THIGH, MEAT ONLY, FRIED, WITHO |
| 4044 | 63 | 27A | CHICKEN; BROILERS OR FRYERS, WING, MEAT ONLY, FRIED, WITHOU |
| 4045 | 63 | 27A | CHICKEN; BROILERS OR FRYERS, BACK, MEAT ONLY, FRIED, WITHOU |
| 944 | 64 | 27B | POULET A GRILLER/FRIRE, CHAIR+PEAU, CRUES |
| 969 | 64 | 27B | POULET A GRILLER/FRIRE, VIANDE BLANCHE+PEAU, ROTIES |
| 974 | 64 | 27B | POULET A GRILLER/FRIRE, VIANDE BRUNE + PEAU, ROTIES |
| 994 | 64 | 27B | POULET A GRILLER/FRIRE, POITRINE, VIANDE+PEAU, CRUES |
| 997 | 64 | 27B | POULET A GRILLER/FRIRE, POITRINE, VIANDE+PEAU, ROTIES |
| 998 | 64 | 27B | POULET A GRILLER/FRIRE, POITRINE, VIANDE+PEAU, RAGOUT |
| 1015 | 64 | 27B | POULET A GRILLER/FRIRE, CUISSE, VIANDE+PEAU, ROTIES |
| 1016 | 64 | 27B | POULET A GRILLER/FRIRE, CUISSE, VIANDE+PEAU, RAGOUT |
| 1037 | 64 | 27B | POULET A GRILLER/FRIRE, AILE, VIANDE+PEAU, CRUES |
| 1040 | 64 | 27B | POULET A GRILLER/FRIRE, AILE, VIANDE+PEAU, ROTIES |
| 1041 | 64 | 27B | POULET A GRILLER/FRIRE, AILE, VIANDE+PEAU, RAGOUT |
| 1227 | 65 | 27C | VOLAILLE, PRODUIT DE: DINDE, ROULE DE, VIANDE BLANCHE/BRUNE |
| 1504 | 65 | 27C | DINDE, ROULE DE DINDE, VIANDE BLANCHE |
| 1102 | 66 | 27D | DINDE, TOUTES CATEGORIES, CHAIR ET PEAU, ROTIES |
| 1075 | 67 | 27E | CANARD DOMESTIQUE, CHAIR ET PEAU, CRUES |
| 1076 | 67 | 27E | CANARD DOMESTIQUE, CHAIR ET PEAU, ROTIES |
| 1080 | 67 | 27E | CANARD SAUVAGE, CHAIR ET PEAU, CRUES |
| 1081 | 67 | 27E | CANARD SAUVAGE, POITRINE, VIANDE SEULEMENT, CRUE |
| 1082 | 67 | 27E | OIE DOMESTIQUE, CHAIR ET PEAU, CRUES |
| 1083 | 67 | 27E | OIE DOMESTIQUE, CHAIR ET PEAU, ROTIES |
| 1085 | 67 | 27E | OIE DOMESTIQUE, CHAIR SEULEMENT, ROTIE |
| 3909 | 67 | 27E | OIE, CUISSE, VIANDE + PEAU, ROTIES |
| 3997 | 67 | 27E | GIBIER, LAGOPEDE, VIANDE, CRUE |
| 4047 | 68 | 27F | CHICKEN; SKIN, FRIED, WITHOUT ABSORBED FAT |
| 3967 | 69 | 28A | GIBIER, PHOQUE ANNELE, FOIE, CRU |
| 1482 | 70 | 28B | PATE DE FOIE, SANS PRECISIONS, EN CONSERVE |
| 3989 | 71 | 29A | GIBIER, CARIBOU, LANGUE DE, CRUE |
| 3992 | 71 | 29A | GIBIER, CARIBOU, COEUR DE, CRU |
| 1458 | 72 | 30A | SAUCISSES FUMEES, BOEUF |
| 1459 | 72 | 30A | SAUCISSES FUMEES, BOEUF ET PORC |
| 1461 | 72 | 30A | SAUCISSES FUMEES, DINDE |
| 1488 | 72 | 30A | SAUCISSE AU PORC, FRAICHE, CUITE |
| 1489 | 72 | 30A | SAUCISSE AU PORC ET BOEUF, FRAICHE, CUITE |
| 1506 | 72 | 30A | SAUCISSE DE VIENNE (COCKTAIL), EN CONSERVE, BOEUF ET PORC |
| 1507 | 72 | 30A | SAUCISSE ITALIENNE, PORC FRAIS, CUITE |
| 454 | 73 | 31A | MORSE, CRU |
| 3562 | 73 | 31A | GIBIER, VIANDE DE, CARIBOU (RENNE), CRUE |
| 3563 | 73 | 31A | GIBIER, VIANDE DE, CARIBOU (RENNE), ROTIE |
| 3960 | 73 | 31A | GIBIER, PHOQUE ANNELE, VIANDE, CRUE |
| 3962 | 73 | 31A | GIBIER, PHOQUE ANNELE, VIANDE, BOUILLIE |
| 3976 | 73 | 31A | GIBIER, BELUGA, VIANDE, SECHEE |
| 3977 | 73 | 31A | GIBIER, MORSE, VIANDE, CRUE |
| 3979 | 73 | 31A | GIBIER, MORSE, VIANDE, BOUILLIE |
| 3981 | 73 | 31A | GIBIER, OURS POLAIRE, VIANDE, BOUILLIE |
| 3984 | 73 | 31A | GIBIER, CARIBOU, VIANDE, SECHEE |

| A | B | C | D |
|---|---|---|---|
| 3985 | 73 | 31A | GIBIER, CARIBOU, VIANDE, BOUILLIE |
| 1441 | 74 | 32A | SAUCISSON DE BIERE, BOEUF |
| 1445 | 74 | 32A | SAUCISSON DE BOLOGNE, BOEUF |
| 1446 | 74 | 32A | SAUCISSON DE BOLOGNE, BOEUF ET PORC |
| 1467 | 74 | 32A | JAMBON, SALE, TARTINADE POUR SANDWICH AU |
| 1475 | 74 | 32A | PAIN DE VIANDE, PORC, EN CONSERVE |
| 1476 | 74 | 32A | PAIN DE VIANDE, PORC, BOEUF |
| 1484 | 74 | 32A | PEPPERONI, PORC, BOEUF |
| 1491 | 74 | 32A | SALAMI, CUIT, BOEUF |
| 1492 | 74 | 32A | SALAMI, CUIT, BOEUF ET PORC |
| 2755 | 74 | 32A | BOEUF, SALE, "CORNED BEEF", EN CONSERVE |
| 2616 | 75 | 33A | AMANDES, ROTIES A L'HUILE, NON BLANCHIES |
| 2623 | 75 | 33A | NOIX DE BRESIL, SECHEES, NON BLANCHIES |
| 2625 | 75 | 33A | ACAJOU (CAJOUS, ANACARDES) NOIX D', ROTIES A SEC |
| 2638 | 75 | 33A | COCO, NOIX DE, DESSECHEE, NON SUCREE |
| 2647 | 75 | 33A | NOISETTES/AVELINES/COUDRES, SECHEES, NON BLANCHIES |
| 2662 | 75 | 33A | PACANES, SECHEES |
| 2671 | 75 | 33A | NOIX DE GRENOBLE, SECHEES |
| 3310 | 75 | 33A | ARACHIDE, TOUS LES TYPES, GRILLEE A SEC, SEL AJOUTE |
| 3403 | 77 | 33C | ARACHIDE, BEURRE D', CREMEUX, M.G., SUCRE ET SEL AJOUTE |
| 3059 | 78 | 34A | POISSON PLAT (PLIE/FLET/SOLE), CRU |
| 3093 | 78 | 34A | MORUE DU PACIFIQUE OCCIDENTAL, CUITE AU FOUR OU GRILLEE |
| 3138 | 78 | 34A | THON, CHAIR PALE, EN CONSERVE DANS L'EAU, EGOUTTE, + SEL |
| 3194 | 78 | 34A | MORUE DE L'ATLANTIQUE, CRUE |
| 3195 | 78 | 34A | MORUE DE L'ATLANTIQUE, CUITE AU FOUR OU GRILLE |
| 3197 | 78 | 34A | AIGLEFIN, CRU |
| 3199 | 78 | 34A | FLETAN DE L'ATLANTIQUE ET DU PACIFIQUE, CRU |
| 3210 | 78 | 34A | COREGONE DE LAC, ESPECES DIVERSES, CRU |
| 3046 | 79 | 34B | CAVIAR, NOIR ET ROUGE, EN GRAINS |
| 3108 | 79 | 34B | SARDINE DE L'ATLANTIQUE, EN CON, DANS HUILE, EGOUTTE + ARETE |
| 3205 | 79 | 34B | SAUMON ROSE, FRAIS/CONGELE, CRU |
| 3206 | 79 | 34B | SAUMON ROSE, EN CONSERVE, CHAIR+ARETE+LIQUIDE, SEL AJOUTE |
| 3208 | 79 | 34B | TRUITE, ESPECES DIVERSES, CRUE |
| 3209 | 79 | 34B | TRUITE, ARC-EN-CIEL, CRUE |
| 3218 | 79 | 34B | SAUMON ROSE, POCHE |
| 3220 | 79 | 34B | OMBLE CHEVALIER, CRU |
| 3941 | 79 | 34B | LAKE TROUT,RAW |
| 3994 | 79 | 34B | OMBLE CHEVALIER (ARCTIQUE), VIANDE, BOUILLIE |
| 3995 | 79 | 34B | OMBLE CHEVALIER (ARCTIQUE), VIANDE, SECHEE |
| 3996 | 79 | 34B | OMBLE CHEVALIER (ARCTIQUE), VIANDE + PEAU, SECHEE |
| 3105 | 80 | 35A | SAUMON KETA, EN CONSERVE, EGOUTTE, AVEC ARETE, SEL AJOUTE |
| 3168 | 80 | 35A | MYE (PALOURDE), ESPECES DIVERSES, CRUE |
| 3174 | 80 | 35A | MOULE BLEUE, CRUE |
| 3175 | 80 | 35A | MOULE BLEUE, CUITE A LA VAPEUR OU BOUILLIE |
| 3177 | 80 | 35A | HUITRE DE L'ATLANTIQUE, CRUE |
| 3214 | 80 | 35A | PETONCLE (COQUILLE ST.JACQUES), ESPECES DIVERSES, CRU |
| 2527 | 81 | 36A | HARICOTS JAUNES OU VERTS, BOUILLIS, EGOUTTES |
| 2528 | 81 | 36A | HARICOTS JAUNES OU VERTS, EN CONSERVE, SOLIDES EGOUTTES |
| 2533 | 82 | 36B | BROCOLI, CRU |
| 2534 | 82 | 36B | BROCOLI, BOUILLI, EGOUTTE |
| 2536 | 83 | 36C | CHOU, CRU |
| 2540 | 84 | 36D | CHOU-FLEUR, CRU |
| 2541 | 84 | 36D | CHOU-FLEUR, BOUILLI, EGOUTTE |
| 2159 | 85 | 36E | CAROTTES, EN CONSERVE, SOLIDES ET LIQUIDE |
| 2160 | 85 | 36E | CAROTTES, EN CONSERVE, SOLIDES EGOUTTES |

| A | B | C | D |
|---|---|---|---|
| 2538 | 85 | 36E | CAROTTES, CRUES |
| 2539 | 85 | 36E | CAROTTES, BOUILLIES, EGOUTTEES |
| 2542 | 86 | 36F | CELERI, CRU |
| 2543 | 86 | 36F | CELERI, BOUILLI, EGOUTTE |
| 2186 | 87 | 36G | MAIS SUCRE, AVEC OU SANS EPI, BOUILLI, EGOUTTE |
| 2544 | 87 | 36G | MAIS SUCRE, EN CONSERVE, EN CREME |
| 2545 | 87 | 36G | MAIS SUCRE, EN CONSERVE, SOUS VIDE, "NIBLETS" |
| 2238 | 88 | 36H | LAITUE BUTTERHEAD (BOSTON), CRUE |
| 2549 | 88 | 36H | LAITUE POMMEE (ICEBERG), CRUE |
| 2246 | 89 | 36I | CHAMPIGNONS, CRUS |
| 2247 | 89 | 36I | CHAMPIGNONS, BOUILLIS, EGOUTTES |
| 2550 | 89 | 36I | CHAMPIGNONS, EN CONSERVE, SOLIDES EGOUTTES |
| 2210 | 90 | 36J | AIL, CRU |
| 2262 | 90 | 36J | OIGNONS, CRUS |
| 2263 | 90 | 36J | OIGNONS, FLOCONS DESHYDRATES |
| 2269 | 90 | 36J | OIGNONS, VERTS, CRUS |
| 2551 | 90 | 36J | OIGNONS, BOUILLIS, EGOUTTES |
| 2280 | 91 | 36K | POIS, PETITS (VERT), CRUS |
| 2281 | 91 | 36K | POIS, PETITS (VERT), EN CONSERVE, SOLIDES ET LIQUIDE |
| 2286 | 91 | 36K | POIS ET CAROTTES, EN CONSERVE, SOLIDES ET LIQUIDE |
| 2552 | 91 | 36K | POIS, PETITS (VERT), BOUILLIS, EGOUTTES |
| 2553 | 91 | 36K | POIS, PETITS (VERT), EN CONSERVE, SOLIDES EGOUTTES |
| 2554 | 91 | 36K | POIS, PETITS (VERT), CONGELES, BOUILLIS, EGOUTTES |
| 2293 | 92 | 36L | POIVRONS, VERTS, BOUILLIS, EGOUTTES |
| 2517 | 92 | 36L | POIVRONS, ROUGES, CRUS |
| 2519 | 92 | 36L | POIVRONS, ROUGES, BOUILLIS, EGOUTTES |
| 2524 | 92 | 36L | PIMENT DE LA JAMAIQUE, EN CONSERVE |
| 2555 | 92 | 36L | POIVRONS, VERTS, CRUS |
| 2372 | 94 | 36N | TOMATES, SAUCE A SPAGHETTI, EN CONSERVE |
| 2432 | 94 | 36N | TOMATES, PATE DE, EN CONSERVE |
| 2433 | 94 | 36N | TOMATES, PUREE DE, EN CONSERVE |
| 2563 | 94 | 36N | TOMATES, ROUGES, MURES, CRUES |
| 2565 | 94 | 36N | TOMATES, ROUGES, MURES, EN CONSERVE, ENTIERES |
| 2568 | 94 | 36N | TOMATES, SAUCE DE, EN CONSERVE |
| 4031 | 94 | 36N | TOMATO PRODUCTS, CANNED; PASTE, W/SALT ADDED |
| 2567 | 95 | 36O | TOMATE, JUS DE, EN CONSERVE |
| 2569 | 95 | 36O | LEGUMES, JUS DE, COCKTAIL, EN CONSERVE |
| 281 | 96 | 36P | MARINADES, RELISH, COUPEE OU HACHEE FIN, SUCREE |
| 2143 | 96 | 36P | CHOUX DE BRUXELLES, CONGELES, BOUILLIS, EGOUTTES |
| 2273 | 96 | 36P | PERSIL, CRU |
| 2354 | 96 | 36P | RADIS, CRUS |
| 2361 | 96 | 36P | ALGUES, AGAR, CRUES |
| 2414 | 96 | 36P | PATATES DOUCES, CUITES AU FOUR AVEC PELURE |
| 2440 | 96 | 36P | NAVETS, CRUS |
| 2441 | 96 | 36P | NAVETS, BOUILLIS, EGOUTTES |
| 2452 | 96 | 36P | LEGUMES, MACEDOINE, EN CONSERVE, SOLIDES EGOUTTES |
| 2454 | 96 | 36P | LEGUMES, MACEDOINE, CONGELEE, BOUILLIE, EGOUTTEE |
| 2470 | 96 | 36P | BETTERAVES MARINEES, EN CONSERVE, SOLIDES ET LIQUIDE |
| 2548 | 96 | 36P | CONCOMBRE, CRU |
| 2578 | 96 | 36P | MARINADES, CORNICHONS A L'ANETH |
| 4230 | 96 | 36P | CUCUMBER, PARED |
| 3399 | 97 | 37A | HARICOTS AU FOUR (FEVES AU LARD), EN CONSERVE, AU LARD |
| 541 | 98 | 37B | COLORANT A CAFE (NON LAITIER), EN POUDRE |
| 2343 | 99 | 38A | POMMES DE TERRE, BATONNETS DE |
| 2534 | 99 | 38A | CROUSTILLES |

| A | B | C | D |
|---|---|---|---|
| 4130 | 99 | 38A | POTATO CHIPS; BARBECUED |
| 2326 | 100 | 38B | POMMES DE TERRE, RISSOLEES, CONGELEES, PREPAREES |
| 2335 | 100 | 38B | POMMES DE TERRE, FRITES, CONGELEES, NATURE |
| 2558 | 100 | 38B | POMMES DE TERRE, FRITES, CONGELEES, MAISON, PREP AU FOUR |
| 2302 | 101 | 39A | POMMES DE TERRE, CRUES, CHAIR |
| 2304 | 101 | 39A | POMMES DE TERRE, AU FOUR, CHAIR SEULEMENT |
| 2315 | 101 | 39A | POMMES DE TERRE, EN PUREE, FLOCONS SANS LAIT, SECS |
| 2556 | 101 | 39A | POMMES DE TERRE, BOUILLIES SANS LA PELURE, CHAIR, EGOUTTE |
| 2557 | 101 | 39A | POMMES DE TERRE, EN CONSERVE, SOLIDES EGOUTTES |
| 2583 | 101 | 39A | POMMES DE TERRE, BOUILLIES AVEC LA PELURE, CHAIR+PELURE |
| 1736 | 102 | 40A | PAMPLEMOUSSE ROSE, ROUGE OU BLANC, TOUTES REGIONS, CRU |
| 1767 | 102 | 40A | CITRON, ZESTE DE, CRU |
| 1793 | 102 | 40A | ORANGES, AVEC PELURE, CRUES |
| 1799 | 102 | 40A | TANGERINES (MANDARINES), CRUES |
| 1892 | 102 | 40A | ORANGES, TOUTES VARIETES COMMERCIALES, CRUES |
| 1648 | 103 | 40B | POMMES, CRUES, SANS PELURE |
| 1878 | 103 | 40B | POMMES, CRUES, AVEC PELURE |
| 1880 | 103 | 40B | POMMES, PUREE DE, EN CONSERVE, SUCREE |
| 1881 | 104 | 40C | BANANES, CRUES |
| 1888 | 106 | 40E | RAISINS, TYPE EUROPEENS, PEAU ADHERENTE, CRUS |
| 1906 | 106 | 40E | RAISINS SECS, SANS PEPINS (SULTANA) |
| 1876 | 107 | 40F | MELON D'EAU (PASTEQUE), CRU |
| 1891 | 107 | 40F | MELONS, CANTALOUP, FRAIS |
| 1810 | 108 | 40G | PECHES, MOITIES/TRANCHEES EN CONSERVE, +JUS, SOL+LIQ |
| 1826 | 109 | 40H | POIRES, MOITIES EN CONSERVE, +SIROP LEGER, SOLIDES + LIQUIDE |
| 1836 | 110 | 40I | ANANAS, CRU |
| 1900 | 110 | 40I | ANANAS, EN CONSERVE, +JUS, SOLIDES + LIQUIDE |
| 1901 | 110 | 40I | ANANAS, EN CONSERVE, +SIROP LEGER, SOLIDES + LIQUIDE |
| 1904 | 111 | 40J | PRUNES, CRUES |
| 1872 | 112 | 40K | FRAISES, CONGELEES, SUCREES, TRANCHEES |
| 1909 | 112 | 40K | FRAISES, CRUES |
| 1682 | 113 | 40L | MURES, CRUES |
| 1724 | 113 | 40L | FRUITS, COCKTAIL DE, EN CONSERVE, +JUS, SOL+LIQ |
| 1732 | 113 | 40L | FRUITS, SALADE DE, EN CONSERVE, +SIROP EPAIS, SOL+LIQ |
| 1788 | 113 | 40L | OLIVES, MURES, EN CONSERVE, PETITES -> EXTRA LARGES |
| 1882 | 113 | 40L | BLEUETS, CRUS |
| 1883 | 113 | 40L | BLEUETS, CONGELES, NON SUCRES |
| 378 | 114 | 41A | SUCRE, DE BETTERAVE OU DE CANNE, BRUN (CASSONADE) |
| 379 | 114 | 41A | SUCRE, DE BETTERAVE OU DE CANNE, GRANULE, BLANC |
| 234 | 115 | 41B | CONFITURES ET CONSERVES |
| 235 | 115 | 41B | GELEES |
| 4196 | 115 | 41B | JAMS; PRESERVES, MARMALADE, REDUCED SUGAR |
| 229 | 116 | 41C | MIEL, FILTRE OU EXTRAIT |
| 244 | 116 | 41C | MELASSE QUALITE FANTAISIE |
| 366 | 116 | 41C | SIROP, DE CANNE |
| 367 | 116 | 41C | SIROP, D'ERABLE |
| 369 | 116 | 41C | SIROP, DE TABLE, PRINCIPALEMENT DE MAIS, CLAIR ET FONCE |
| 380 | 116 | 41C | SUCRE, DE BETTERAVE OU DE CANNE, EN POUDRE |
| 458 | 116 | 41C | CARAMEL, TARTINADE |
| 381 | 117 | 41D | SUCRE, DEXTROSE, ANHYDRE |
| 3914 | 117 | 41D | EGAL (EDULCORANT HYPOCALORIQUE) |
| 323 | 118 | 42A | MAIS A SOUFFLER, SOUFFLE, NATURE |
| 327 | 118 | 42A | BRETZELS |
| 140 | 119 | 42B | FROMAGE, PAILLES AU |
| 4064 | 119 | 42B | TORTILLA CHIPS |

| A | B | C | D |
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| 97 | 120 | 43A | GATEAU, PREP POUR GLACE, FUDGE AU CHOCOLAT, SECHE |
| 103 | 120 | 43A | BONBONS, CARAMELS, ORDINAIRES OU AU CHOCOLAT |
| 105 | 120 | 43A | BONBONS, CARAMELS, ROULEAU A SAVEUR DE CHOCOLAT |
| 130 | 120 | 43A | BONBONS, DURS (SUCRE D'ORGE) |
| 143 | 120 | 43A | GOMME A MACHER |
| 4150 | 120 | 43A | FRUIT LEATHER |
| 4153 | 120 | 43A | PEANUT BUTTER MORSELS |
| 233 | 121 | 43B | GLACES A L'EAU, LIME |
| 223 | 122 | 43C | GELATINE, DESSERT A LA POUDRE, FAIT AVEC DE L'EAU |
| 333 | 122 | 43C | POUDING, PREP POUR, AMIDON, CHOCOLAT, INSTANT, SEC |
| 335 | 122 | 43C | POUDING, PREP POUR, GOMME VEGETALE, FLAN, SEC |
| 542 | 122 | 43C | GARNITURE A DESSERT, EN POUDRE, BASE DE PRODUIT NON LAITIER |
| 545 | 122 | 43C | GARNITURE A DESSERT, SEMI-SOLIDE, CONGELEE, NON LAITIER |
| 107 | 123 | 44A | BONBONS, CHOCOLAT, SEMI-SUCRE |
| 109 | 123 | 44A | BONBONS, CHOCOLAT AU LAIT, ORDINAIRE |
| 110 | 123 | 44A | BONBONS, CHOCOLAT AU LAIT AVEC AMANDES |
| 114 | 123 | 44A | BONBONS, ENROBES DE CHOCOLAT, FUDGE AU CHOCOLAT AVEC NOIX |
| 115 | 123 | 44A | BONBONS, ENROBES DE CHOCOLAT, CENTRE A LA NOIX DE COCO |
| 117 | 123 | 44A | BONBONS, ENROBES DE CHOCOLAT, FUDGE AVEC CARAMEL + ARACHIDES |
| 118 | 123 | 44A | BONBONS, ENROBES DE CHOCOLAT, FUDGE AVEC ARACHIDES + CARAMEL |
| 120 | 123 | 44A | BONBONS, ENROBES DE CHOCOLAT, NOUGAT ET CARAMEL |
| 121 | 123 | 44A | BONBONS, ENROBES DE CHOCOLAT, ARACHIDES |
| 122 | 123 | 44A | BONBONS, ENROBES DE CHOCOLAT, RAISINS SECS |
| 150 | 123 | 44A | CHOCOLAT, AMER OU A CUIRE |
| 159 | 123 | 44A | CACAO, EN POUDRE, A DEJEUNER |
| 161 | 123 | 44A | CACAO, EN POUDRE, FAIBLE EN GRAS |
| 4059 | 123 | 44A | CANDY; MILK CHOCOLATE WITH CEREAL |
| 4080 | 123 | 44A | CANDY; ROLO |
| 4081 | 123 | 44A | CANDY; KIT KAT |
| 4085 | 123 | 44A | CANDY; SNICKERS |
| 4087 | 123 | 44A | CANDY; NOUGAT, NFS |
| 1659 | 124 | 45A | POMME, JUS DE, EN CONSERVE/BOUTEILLE, VIT C NON AJOUTE |
| 1661 | 124 | 45A | POMME, JUS DE, CONCENTRE CONGELE, DILUE, VIT C NON AJOUTEE |
| 1745 | 124 | 45A | PAMPLEMOUSSE, JUS DE, EN CONSERVE, SUCRE |
| 1747 | 124 | 45A | PAMPLEMOUSSE, JUS DE, BLANC, FRAIS |
| 1751 | 124 | 45A | RAISINS, JUS DE, EN CONSERVE OU EN BOUTEILLE |
| 1764 | 124 | 45A | CITRON, JUS DE, FRAIS |
| 1765 | 124 | 45A | CITRON, JUS DE, EN CONSERVE OU EN BOUTEILLE |
| 1794 | 124 | 45A | ORANGE, JUS D', FRAIS |
| 1795 | 124 | 45A | ORANGE, JUS D', GLACE |
| 1822 | 124 | 45A | PECHES, NECTAR DE, EN CONSERVE |
| 1838 | 124 | 45A | ANANAS, JUS D', EN CONSERVE, + VITAMINE C |
| 1886 | 124 | 45A | PAMPLEMOUSSE, JUS DE, EN CONSERVE, NON SUCRE |
| 1890 | 124 | 45A | RAISINS, JUS DE, CONCENTRE CONGELE, SUCRE, DILUE, +VIT C |
| 1893 | 124 | 45A | ORANGE, JUS D', EN CONSERVE |
| 1894 | 124 | 45A | ORANGE, JUS D', CONCENTRE CONGELE, DILUE |
| 1911 | 124 | 45A | POMME, JUS DE, EN CONSERVE/BOUTEILLE, VIT C AJOUTE |
| 1913 | 124 | 45A | POMME, JUS DE, CONCENTRE CONGELE, DILUE, VITAMINE C AJOUTE |
| 2907 | 125 | 46A | BOISSONS GAZEUSES, SODA AU RAISIN |
| 2908 | 125 | 46A | BOISSONS GAZEUSES, SODA AU CITRON ET A LA LIME |
| 2909 | 125 | 46A | BOISSONS GAZEUSES, SODA A L'ORANGE |
| 2974 | 125 | 46A | BOISSONS GAZEUSES, COLA |
| 2979 | 126 | 46B | BOISSONS GAZEUSES, COLA, EDULCORE A L'ASPARTAME |
| 2946 | 127 | 46C | LIMONADE, BLANC, CONCENTRE CONGELE + EAU |
| 2976 | 127 | 46C | FRUITS, BOISSON AU JUS DE PUNCH AUX, CONCENTRE CONGELE + EAU |

| A | B | C | D |
|---|---|---|---|
| 3011 | 127 | 46C | FRUITS, BOISSON A SAVEUR DE PUNCH AUX, + VIT C, POUDRE + EAU |
| 3012 | 127 | 46C | FRUITS, PUNCH AUX, BOISSON, + VITAMINE C, EN BOITE |
| 3013 | 127 | 46C | RAISIN, BOISSON AU, + VITAMINE C, EN BOITE |
| 3014 | 127 | 46C | RAISIN, BOISSON AU JUS DE, + VITAMINE C, EN BOITE |
| 3023 | 127 | 46C | ORANGE, BOISSON A SAVEUR D', + VITAMINE C, POUDRE |
| 3032 | 127 | 46C | FRUITS, BOISSON A SAVEUR DE PUNCH AUX, EN POUDRE + EAU |
| 3033 | 127 | 46C | LIMONADE, BOISSON A SAVEUR DE, EN POUDRE |
| 3921 | 127 | 46C | Boisson aux fruits, Fruite (utilise entre 1990-91, Quebec) |
| 2922 | 128 | 46D | CACAO, MELANGE DE, NON ENRICHI, EN POUDRE |
| 2895 | 129 | 47A | WHISKY (40% ALCOOL PAR VOLUME) |
| 2896 | 129 | 47A | RHUM (40% ALCOOL PAR VOLUME) |
| 2897 | 129 | 47A | VODKA (40% ALCOOL PAR VOLUME) |
| 2978 | 130 | 47B | LIQUEUR AU CAFE AVEC CREME (17% ALCOOL PAR VOLUME) |
| 2901 | 131 | 48A | VIN DE TABLE, ROUGE (11,5% ALCOOL PAR VOLUME) |
| 2903 | 131 | 48A | VIN DE TABLE, BLANC (11,5% ALCOOL PAR VOLUME) |
| 2996 | 132 | 49A | BIERE, ORDINAIRE (5% ALCOOL PAR VOLUME) |
| 1251 | 134 | 50A | SOUPE, EN CONSERVE, CELERI, CREME DE, CONDENSEE |
| 1271 | 134 | 50A | SOUPE, EN CONSERVE, CHAMPIGNONS, CREME DE,CONDENSEE |
| 1275 | 134 | 50A | SOUPE, EN CONSERVE, POMMES DE TERRE, CREME DE,CONDENSEE |
| 1279 | 134 | 50A | SOUPE, EN CONSERVE, TOMATES ET RIZ, CONDENSEE |
| 1283 | 134 | 50A | SOUPE, EN CONSERVE, LEGUMES, "CHUNKY", PRETE-A-SERVIR |
| 1284 | 134 | 50A | SOUPE, EN CONSERVE, POTAGE VEGETARIEN, CONDENSE |
| 1302 | 134 | 50A | SOUPE, DESHYDRATEE, POIREAUX |
| 1303 | 134 | 50A | SOUPE, DESHYDRATEE, MINESTRONE |
| 1307 | 134 | 50A | SOUPE, DESHYDRATEE, TOMATES |
| 1308 | 134 | 50A | SOUPE, DESHYDRATEE, TOMATES ET LEGUMES |
| 1430 | 134 | 50A | SOUPE, EN CONSERVE, POIS CASSES JAUNES, CONDENSEE |
| 1433 | 134 | 50A | SOUPE, EN CONSERVE, TOMATES, CONDENSEE |
| 1249 | 135 | 50B | SOUPE, EN CONSERVE, BOUILLON DE BOEUF OU CONSOMME, P-A-S |
| 1250 | 135 | 50B | SOUPE, EN CONSERVE, BOEUF ET NOUILLES, CONDENSEE |
| 1253 | 135 | 50B | SOUPE, EN CONSERVE, BOUILLON DE POULET, CONDENSE |
| 1257 | 135 | 50B | SOUPE, EN CONSERVE, POULET ET NOUILLES, "CHUNKY", P-A-S |
| 1258 | 135 | 50B | SOUPE, EN CONSERVE, POULET ET NOUILLES, CONDENSEE |
| 1263 | 135 | 50B | SOUPE, EN CONSERVE, PALOURDES, MANHATTAN, "CHUNKY", P-A-S |
| 1264 | 135 | 50B | SOUPE, EN CONSERVE, PALOURDES, MANHATTAN, CONDENSEE |
| 1265 | 135 | 50B | SOUPE, EN CONSERVE, PALOURDES, NLLE-ANGLETERRE, CONDENSEE |
| 1285 | 135 | 50B | SOUPE, EN CONSERVE, BOEUF, "CHUNKY", PRETE-A-SERVIR |
| 1289 | 135 | 50B | SOUPE, DESHYDRATEE, BOUILLON DE BOEUF OU CONSOMME |
| 1290 | 135 | 50B | SOUPE, DESHYDRATEE, BOUILLON DE BOEUF, EN CUBES |
| 1291 | 135 | 50B | SOUPE, DESHYDRATEE, BOEUF ET NOUILLES |
| 1294 | 135 | 50B | SOUPE, DESHYDRATEE, BOUILLON DE POULET |
| 1297 | 135 | 50B | SOUPE, DESHYDRATEE, POULET ET RIZ |
| 1334 | 135 | 50B | SOUPE, DESHYDRATEE, POULET ET NOUILLES |
| 1323 | 136 | 50C | SAUCES, EN CONSERVE, BOEUF |
| 1325 | 136 | 50C | SAUCES, EN CONSERVE, POULET |
| 1326 | 136 | 50C | SAUCES, DESHYDRATEES, POULET |
| 388 | 137 | 50D | TOMATE, SAUCE CHILI, EN BOUTEILLE |
| 1312 | 137 | 50D | SAUCES, DESHYDRATEES, FROMAGE |
| 1317 | 137 | 50D | SAUCES, DESHYDRATEES, AIGRE-DOUCE |
| 1335 | 137 | 50D | SAUCES, PRETE-A-SERVIR, SOJA |
| 1339 | 137 | 50D | SAUCES, PRETE-A-SERVIR, BARBECUE |
| 2577 | 137 | 50D | TOMATES, KETCHUP (CATSUP) |
| 909 | 138 | 50E | VINAIGRETTE, COMMERCIALE, MILLE ILES |
| 911 | 138 | 50E | VINAIGRETTE, COMMERCIALE, FRANCAISE (HYPOCALORIQUE) |
| 914 | 138 | 50E | SAUCE A SALADE, COMMERCIALE, MAYONNAISE, >65% D'HUILE |

| A | B | C | D |
|---|---|---|---|
| 916 | 138 | 50E | VINAIGRETTE, COMMERCIALE, FRANCAISE |
| 3902 | 138 | 50E | VINAIGRETTE, MIRACLE WHIP (reguliere) |
| 4072 | 138 | 50E | SALAD DRESSING; CAESAR |
| 254 | 139 | 50F | MOUTARDE, PREPAREE, BRUNE |
| 255 | 139 | 50F | MOUTARDE, PREPAREE, JAUNE |
| 361 | 139 | 50F | SEL, DE TABLE |
| 396 | 139 | 50F | VINAIGRE, DE CIDRE |
| 397 | 139 | 50F | VINAIGRE, DISTILLE |
| 4066 | 139 | 50F | ADDED CALCIUM |
| 3907 | 140 | 50G | NUTRIBAR (substitut de repas) |
| 2963 | 141 | 51A | THE INFUSE |
| 2925 | 142 | 51B | CAFE, INFUSE, FAIT AVEC L'EAU DISTILLE |
| 2926 | 142 | 51B | CAFE, INFUSE |
| 2927 | 142 | 51B | CAFE, INSTANTANE, ORDINAIRE, EN POUDRE |
| 2928 | 142 | 51B | CAFE, INSTANTANE, ORDINAIRE, EN POUDRE + EAU |
| 2930 | 142 | 51B | CAFE, INSTANTANE, DECAFEINE, EN POUDRE + EAU |
| 11 | 143 | 51C | L'eau pour les recettes |
| 2972 | 143 | 51C | EAU MINERALE, EN BOUTEILLE, PERRIER |
| 2973 | 143 | 51C | EAU MINERALE, EN BOUTEILLE, POLAND SPRINGS |
| 2986 | 143 | 51C | EAU, MUNICIPALE |
| 640 | 146 | 53A | BASILIC, MOULU |
| 647 | 146 | 53A | CANNELLE, MOULUE |
| 648 | 146 | 53A | CLOU DE GIROFLE, MOULU |
| 657 | 146 | 53A | AIL, POUDRE D' |
| 661 | 146 | 53A | MOUTARDE, GRAINES DE, JAUNE |
| 662 | 146 | 53A | MUSCADE, MOULUE |
| 664 | 146 | 53A | ORIGAN, MOULU |
| 665 | 146 | 53A | PAPRIKA |
| 666 | 146 | 53A | PERSIL, SECHE |
| 667 | 146 | 53A | POIVRE, NOIR |
| 668 | 146 | 53A | PIMENT ROUGE OU DE CAYENNE |
| 669 | 146 | 53A | POIVRE, BLANC |
| 675 | 146 | 53A | SAUGE, MOULUE |
| 680 | 146 | 53A | CURCUMA, MOULU |
| 15 | 147 | 53B | POUDRE A PATE, MAISON, CREME DE TARTRE |
| 411 | 147 | 53B | LEVURE DE BOULANGERIE, SECHE |
| 463 | 147 | 53B | VANILLE, EXTRAIT DE |
| 464 | 147 | 53B | LEVURE CHIMIQUE, ACTION CONTINUE |
| 466 | 147 | 53B | SODA A PATE (BICARBONATE DE SOUDE) |

# APPENDIX 5

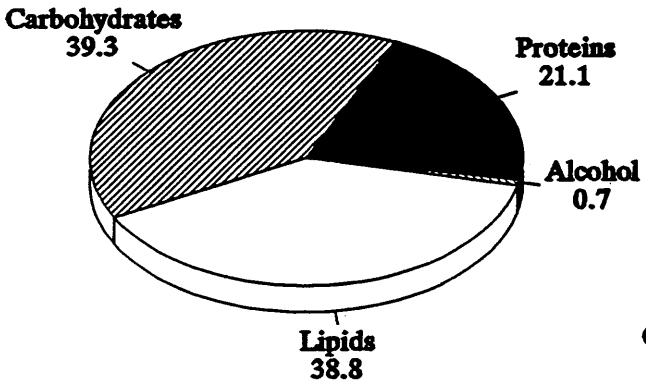
# ADDITIONAL GRAPHS AND TABLES

**GRAPH A-3.1**

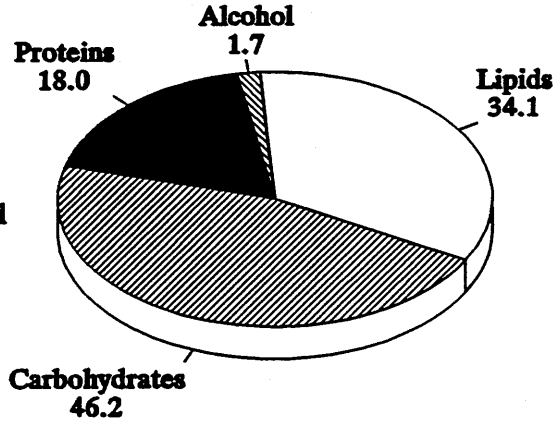
**Proportions of energy intake supplied by macronutrients the day before the survey, according to coast and sector of residence [Inuit, 1992]**

## Coast

### Hudson

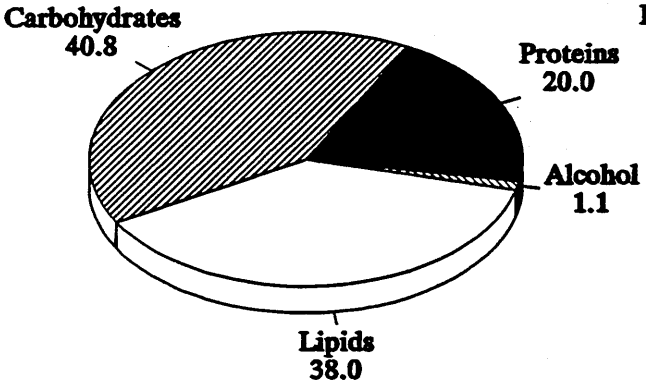



### Ungava

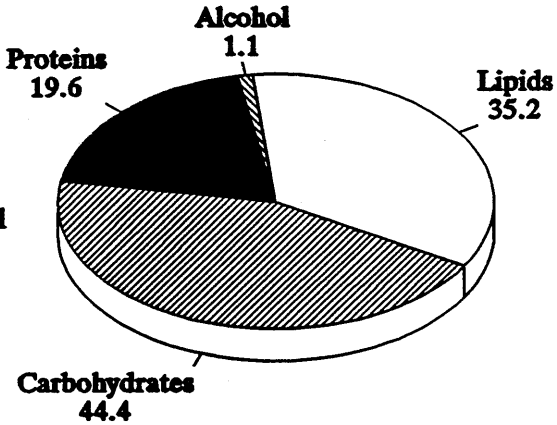



## Sector

### «A»



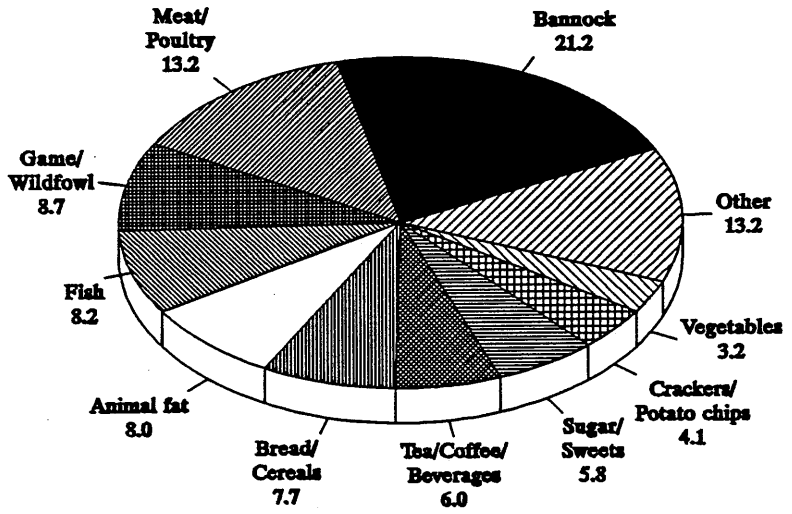

### «B»



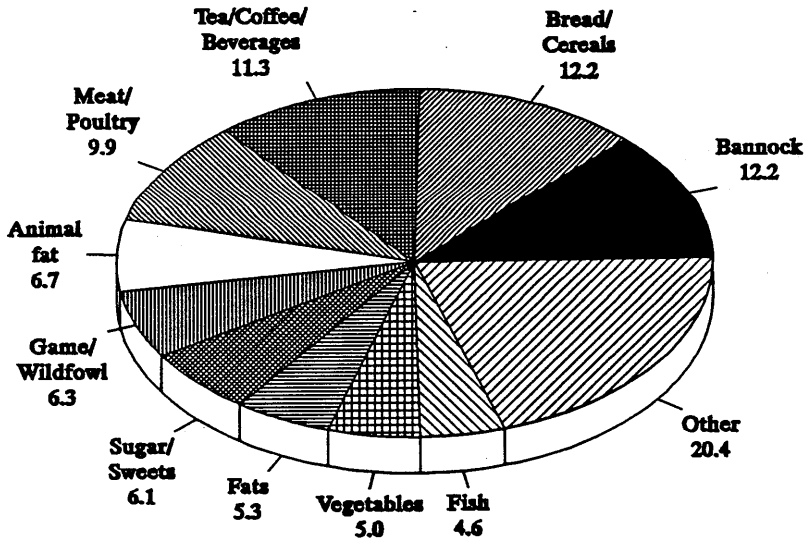
## GRAPH A-3.2

**Contribution of the different food groups to energy intake the day before the survey, according to coast of residence (%) [Inuit, 1992]**

### Hudson




### Ungava

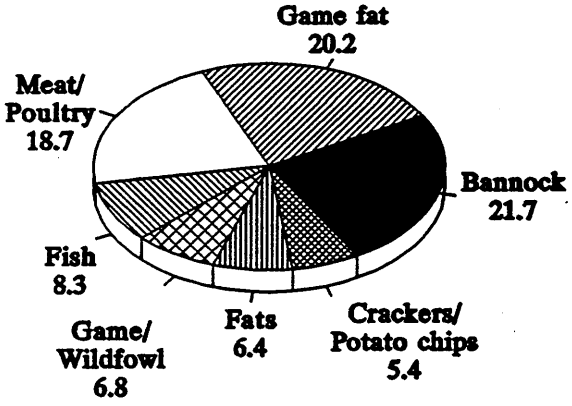


**GRAPH A-3.3**

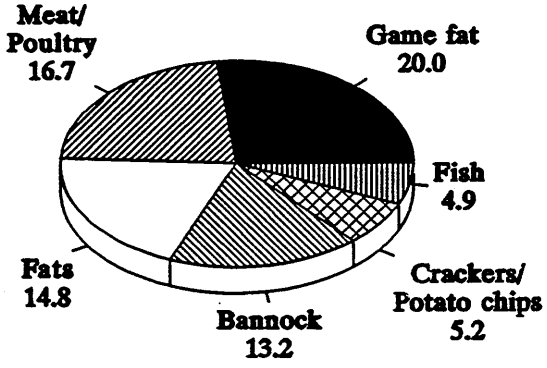
**Contribution of the main food groups to lipid intake the day before the survey, according to coast and sector of residence (%) [Inuit, 1992]**

# Coast

## Hudson

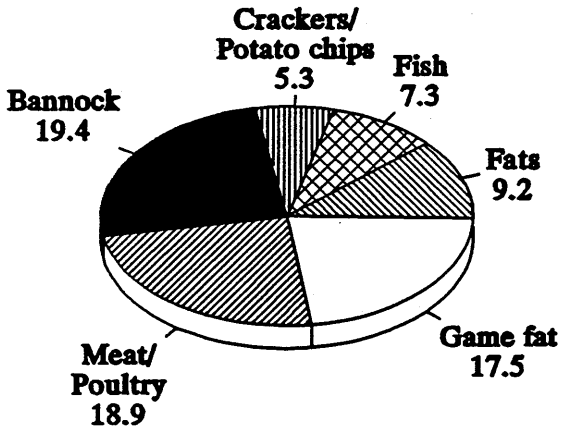



## Ungava

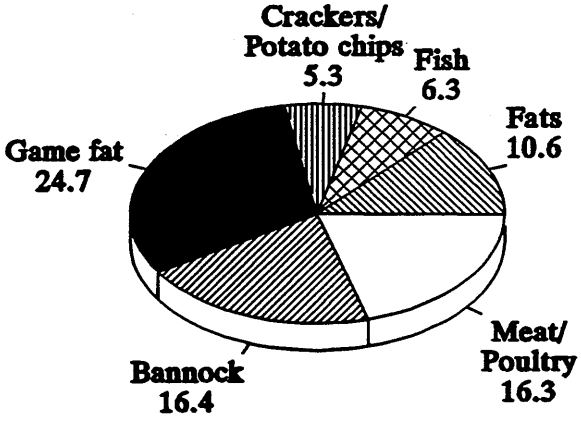



# Sector

## «A»



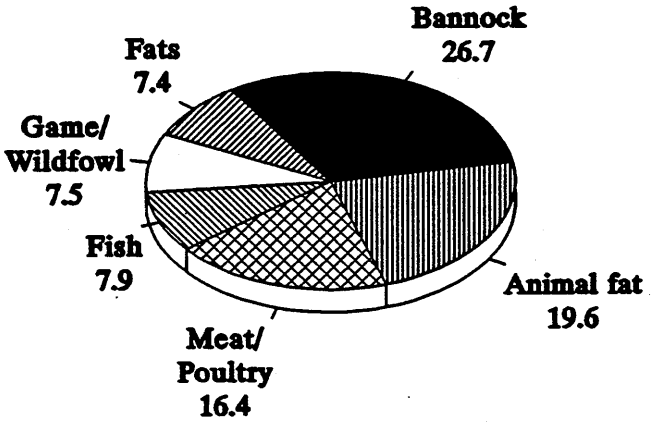

## «B»



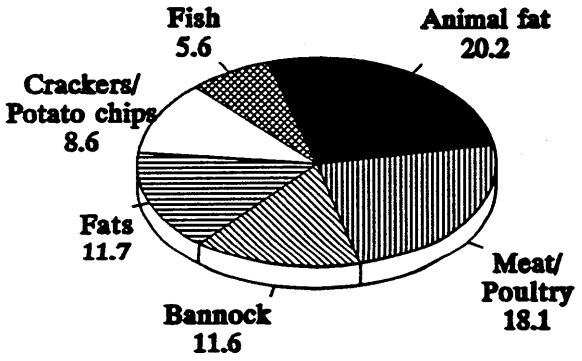
## GRAPH A-3.4

**Contribution of the main food groups to lipid intake the day before the survey, according to level of education (%) [Inuit, 1992]**

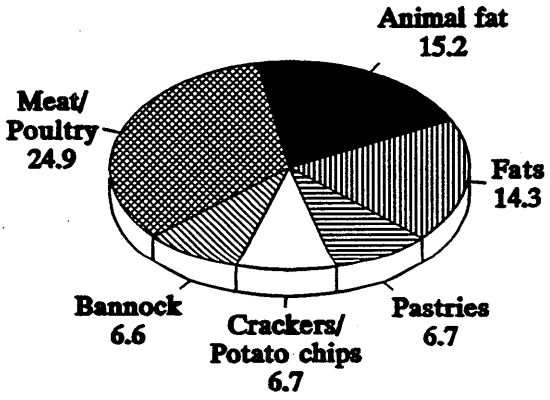
### Primary




### Secondary




### Post-secondary

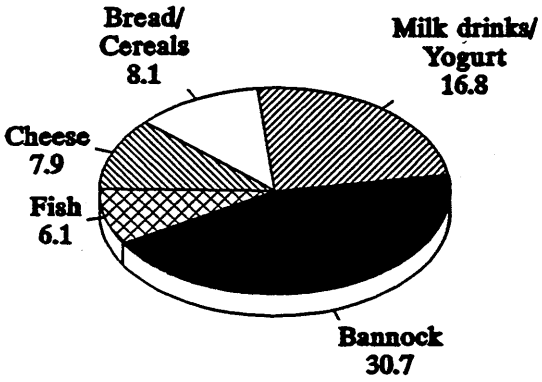


**GRAPH A-3.5**

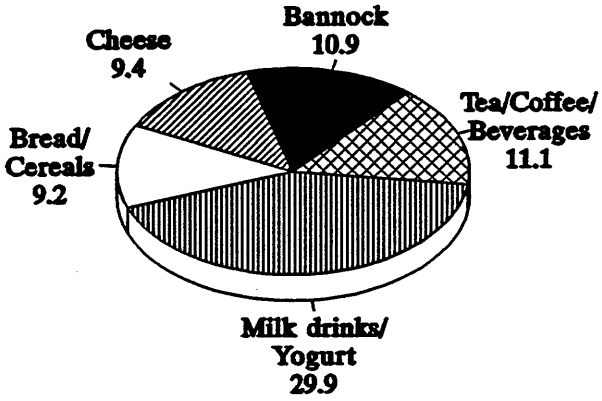
**Contribution of the main food groups to calcium intake the day before the survey, according to coast and sector of residence (%) [Inuit, 1992]**

# Coast

## Hudson

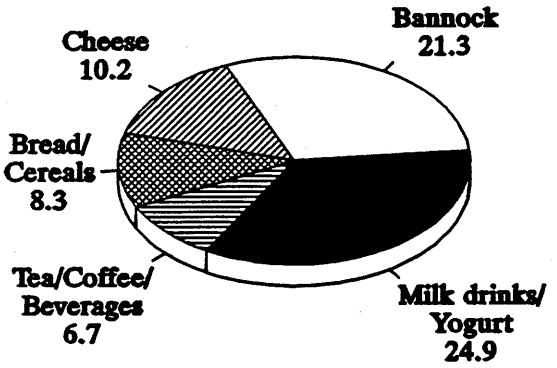



## Ungava

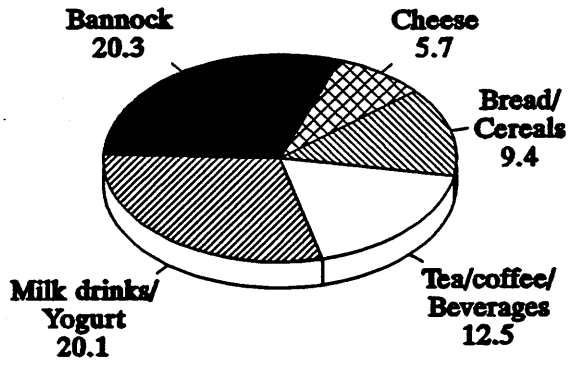



# Sector

## «A»



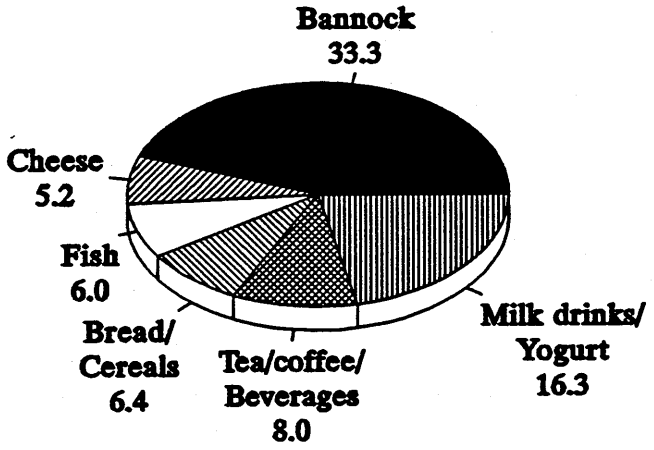

## «B»



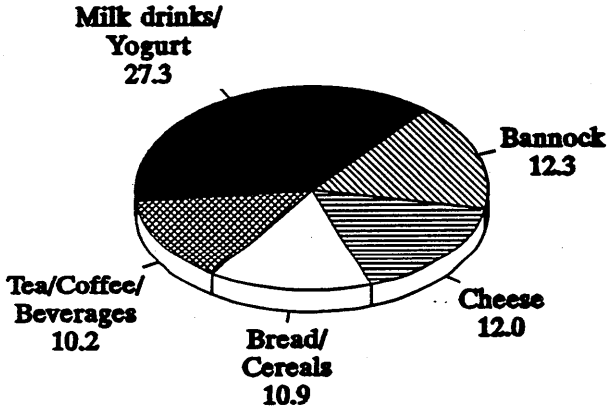
**GRAPH A-3.6**

**Contribution of the main food groups to calcium intake the day before the survey, according to level of education (%) [Inuit, 1992]**

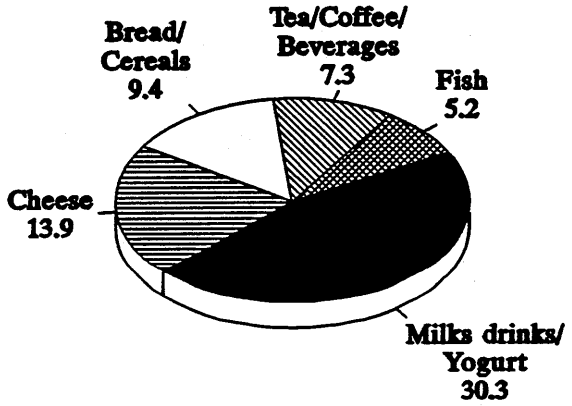
## Primary




## Secondary




## Post-secondary

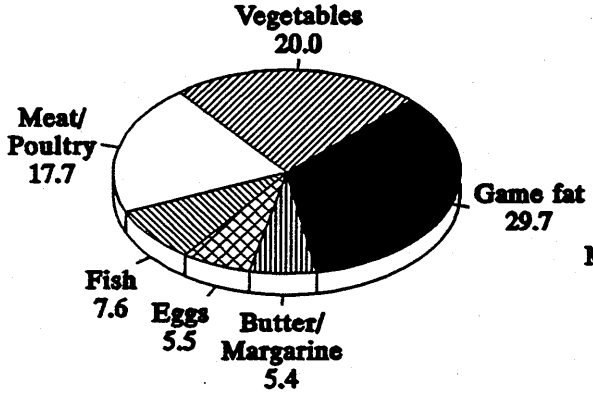


**GRAPH A-3.7**

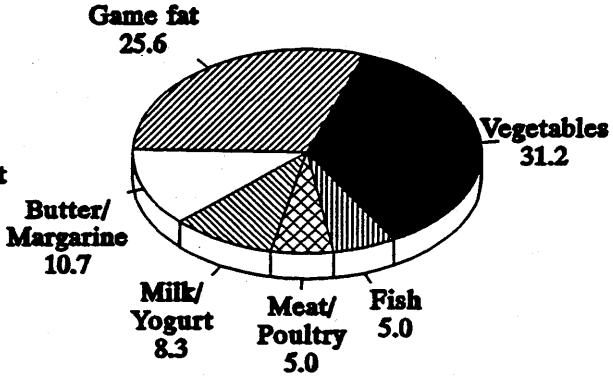
**Contribution of the main food groups to vitamin A intake the day before the survey, according to coast and sector of residence (%) [Inuit, 1992]**

# Coast

## Hudson

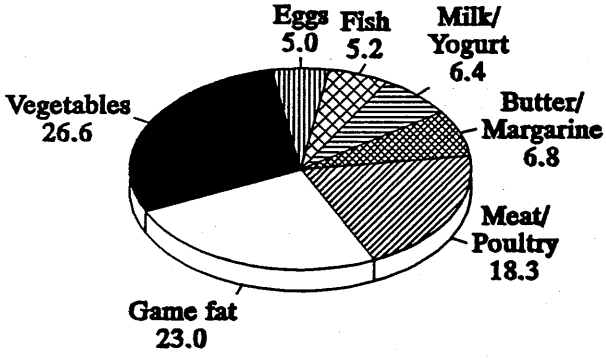



## Ungava

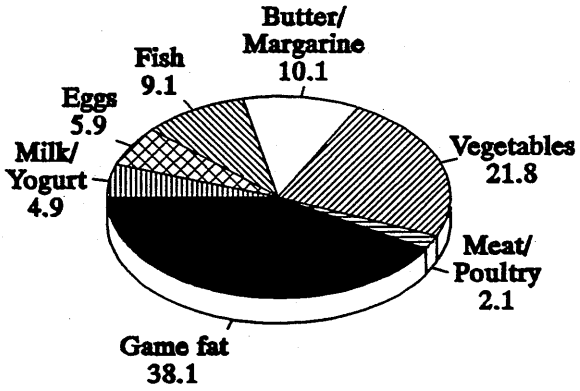



# Sector

## «A»



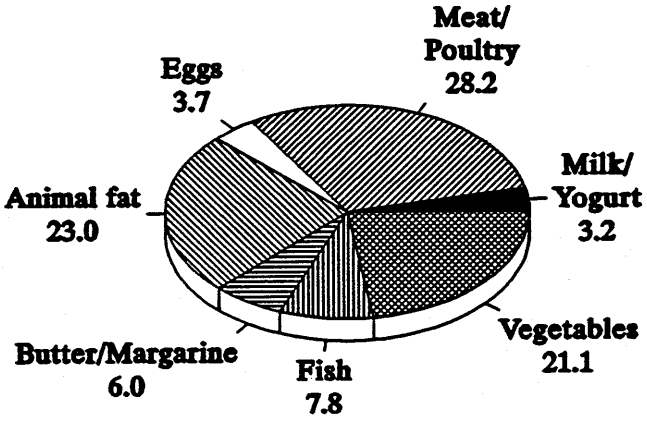

## «B»



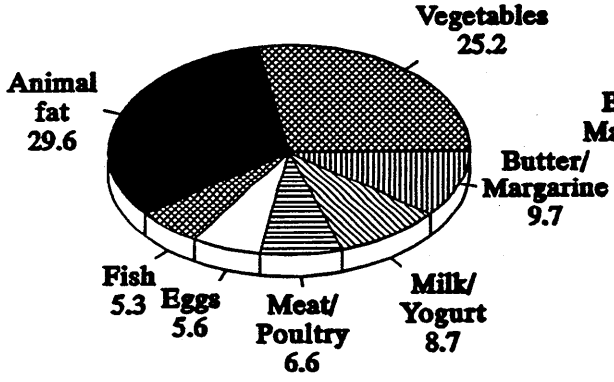
## GRAPH A-3.8

**Contribution of the main food groups to vitamin A intake the day before the survey, according to level of education (%) [Inuit, 1992]**

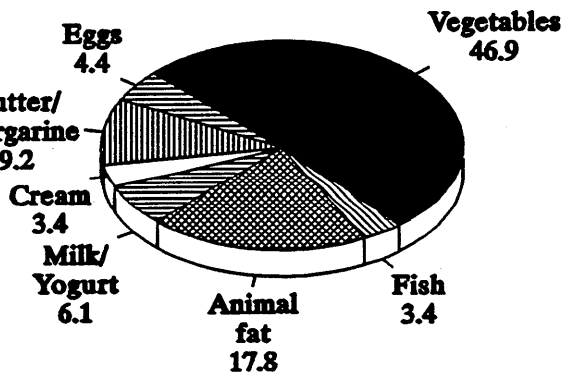
### Primary




### Secondary




### Post-secondary



# ADDITIONAL TABLES

## TABLE A-3.1

### Mean and median energy and nutrient intakes the day before the survey, according to coast of residence [Inuit, 1992]

| | | HUDSON | UNGAVA |
|---|---|---|---|
| | n | 230 | 203 |
| ENERGY (kcal) | MEAN | 2024 | 2175 |
| | MEDIAN | 1854 | 1956 |
| PROTEINS (g) | MEAN | 105 | 95.1 |
| | MEDIAN | 84.5 | 82.8 |
| LIPIDS (g) | MEAN | 92.9 | 86.7 |
| | MEDIAN | 79.9 | 71.8 |
| SAT. FATTY ACIDS (g) | MEAN | 27.2 | 27.9 |
| | MEDIAN | 22.2 | 23.5 |
| MONOUNSAT. FATTY ACIDS (g) | MEAN | 41.9 | 39.2 |
| | MEDIAN | 31.6 | 29.7 |
| POLYUNSAT. FATTY ACIDS (g) | MEAN | 12.4 | 11.2 |
| | MEDIAN | 10.6 | 10.0 |
| LINOLENIC ACID (g) n-3 | MEAN | 3.03 | 2.33 |
| | MEDIAN | 1.64 | 1.52 |
| LINOLEIC ACID (g) n-6 | MEAN | 8.39 | 7.26 |
| | MEDIAN | 6.81 | 6.12 |
| CHOLESTEROL (mg) | MEAN | 378 | 359 |
| | MEDIAN | 255 | 297 |
| CARBOHYDRATES (g) | MEAN | 190 | 248 |
| | MEDIAN | 162 | 222 |
| DIETARY FIBRE (g) | MEAN | 6.54 | 8.29 |
| | MEDIAN | 5.46 | 6.49 |
| ALCOHOL (g) | MEAN | 3.93 | 8.49 |
| | MEDIAN | 0.00 | 0.00 |
| CALCIUM (mg) | MEAN | 387 | 527 |
| | MEDIAN | 327 | 335 |
| MAGNESIUM (mg) | MEAN | 183 | 224 |
| | MEDIAN | 163 | 187 |
| PHOSPHORUS (mg) | MEAN | 1200 | 1265 |
| | MEDIAN | 1026 | 1094 |

... CONT. ON NEXT PAGE ...

| | | HUDSON | UNGAVA |
|---|---|---|---|
| POTASSIUM (mg) | MEAN | 2126 | 2316 |
| | MEDIAN | 1937 | 1952 |
| IRON (mg) | MEAN | 18.7 | 16.4 |
| | MEDIAN | 12.6 | 12.6 |
| ZINC (mg) | MEAN | 9.75 | 10.8 |
| | MEDIAN | 7.66 | 8.36 |
| SODIUM (mg) | MEAN | 2533 | 2384 |
| | MEDIAN | 1803 | 2032 |
| VITAMIN A (µgRE) | MEAN | 655 | 761 |
| | MEDIAN | 299 | 384 |
| CAROTENE (µgRE) | MEAN | 146 | 265 |
| | MEDIAN | 13.1 | 33.3 |
| TOTAL VITAMIN D (µg) | MEAN | 2.75 | 3.56 |
| | MEDIAN | 1.71 | 2.24 |
| VITAMIN E (mg) | MEAN | 7.02 | 6.48 |
| | MEDIAN | 4.31 | 4.82 |
| VITAMIN C (mg) | MEAN | 51.3 | 74.4 |
| | MEDIAN | 20.9 | 28.6 |
| THIAMINE (mg) | MEAN | 1.45 | 1.45 |
| | MEDIAN | 1.12 | 1.15 |
| RIBOFLAVIN (mg) | MEAN | 1.95 | 2.00 |
| | MEDIAN | 1.61 | 1.64 |
| NIACIN (mgEN) | MEAN | 45.0 | 41.4 |
| | MEDIAN | 35.9 | 35.0 |
| VITAMIN $B_6$ (mg) | MEAN | 1.26 | 1.35 |
| | MEDIAN | 1.05 | 1.13 |
| FOLIC ACID (µg) | MEAN | 142 | 172 |
| | MEDIAN | 128 | 143 |
| VITAMIN $B_{12}$ (µg) | MEAN | 12.9 | 12.4 |
| | MEDIAN | 6.18 | 6.15 |
| PANTOTHENIC ACID (mg) | MEAN | 7.64 | 8.23 |
| | MEDIAN | 4.70 | 5.42 |
| CAFFEINE (mg) | MEAN | 280 | 315 |
| | MEDIAN | 216 | 237 |

## TABLE A-3.2

### Mean and median energy and nutrient intakes the day before the survey, according to sector of residence [Inuit, 1992]

| | | A | B |
|---|---|---|---|
| | n | 243 | 190 |
| ENERGY (kcal) | MEAN | 2210 | 1913 |
| | MEDIAN | 1978 | 1696 |
| PROTEINS (g) | MEAN | 107 | 91.6 |
| | MEDIAN | 88.6 | 74.3 |
| LIPIDS (g) | MEAN | 97.8 | 79.7 |
| | MEDIAN | 88.3 | 68.1 |
| SAT. FATTY ACIDS (g) | MEAN | 30.3 | 23.5 |
| | MEDIAN | 26.7 | 18.6 |
| MONOUNSAT. FATTY ACIDS (g) | MEAN | 44.5 | 35.4 |
| | MEDIAN | 35.9 | 26.1 |
| POLYUNSAT. FATTY ACIDS (g) | MEAN | 12.9 | 10.4 |
| | MEDIAN | 11.5 | 8.58 |
| LINOLENIC ACID (g) n-3 | MEAN | 2.99 | 2.39 |
| | MEDIAN | 1.65 | 1.48 |
| LINOLEIC ACID (g) n-6 | MEAN | 8.98 | 6.41 |
| | MEDIAN | 7.43 | 5.10 |
| CHOLESTEROL (mg) | MEAN | 404 | 322 |
| | MEDIAN | 308 | 227 |
| CARBOHYDRATES (g) | MEAN | 221 | 204 |
| | MEDIAN | 190 | 181 |
| DIETARY FIBRE (g) | MEAN | 8.16 | 5.99 |
| | MEDIAN | 6.25 | 5.13 |
| ALCOHOL (g) | MEAN | 6.14 | 5.38 |
| | MEDIAN | 0.00 | 0.00 |
| CALCIUM (mg) | MEAN | 492 | 379 |
| | MEDIAN | 353 | 319 |
| MAGNESIUM (mg) | MEAN | 218 | 174 |
| | MEDIAN | 191 | 148 |
| PHOSPHORUS (mg) | MEAN | 1340 | 1067 |
| | MEDIAN | 1133 | 922 |

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| | | A | B |
|---|---|---|---|
| POTASSIUM (mg) | MEAN | 2455 | 1850 |
| | MEDIAN | 2181 | 1642 |
| IRON (mg) | MEAN | 16.6 | 19.3 |
| | MEDIAN | 12.8 | 12.3 |
| ZINC (mg) | MEAN | 10.5 | 9.72 |
| | MEDIAN | 8.59 | 7.21 |
| SODIUM (mg) | MEAN | 2757 | 2054 |
| | MEDIAN | 2204 | 1461 |
| VITAMIN A (µgRE) | MEAN | 812 | 538 |
| | MEDIAN | 347 | 302 |
| CAROTENE (µgER) | MEAN | 243 | 129 |
| | MEDIAN | 26.6 | 12.6 |
| TOTAL VITAMIN D (µg) | MEAN | 3.54 | 2.43 |
| | MEDIAN | 2.19 | 1.57 |
| VITAMIN E (mgET) | MEAN | 7.50 | 5.79 |
| | MEDIAN | 5.07 | 4.09 |
| VITAMIN C (mg) | MEAN | 67.3 | 51.8 |
| | MEDIAN | 28.1 | 20.0 |
| THIAMINE (mg) | MEAN | 1.59 | 1.25 |
| | MEDIAN | 1.37 | 1.01 |
| RIBOFLAVIN (mg) | MEAN | 2.10 | 1.79 |
| | MEDIAN | 1.67 | 1.49 |
| NIACIN (mgEN) | MEAN | 46.9 | 38.6 |
| | MEDIAN | 38.5 | 31.7 |
| VITAMIN $B_6$ (mg) | MEAN | 1.47 | 1.05 |
| | MEDIAN | 1.26 | 0.87 |
| FOLIC ACID (µg) | MEAN | 170 | 133 |
| | MEDIAN | 148 | 114 |
| VITAMIN $B_{12}$ (µg) | MEAN | 11.6 | 14.3 |
| | MEDIAN | 6.15 | 6.27 |
| PANTOTHENIC ACID (mg) | MEAN | 8.46 | 7.08 |
| | MEDIAN | 5.48 | 4.57 |
| CAFFEINE (mg) | MEAN | 295 | 294 |
| | MEDIAN | 237 | 237 |

## TABLE A-3.3

### Mean and median energy and nutrient intakes the day before the survey, according to level of education [Inuit, 1992]

| | | PRIMARY | SECONDARY | POST-SECONDARY |
|---|---|---|---|---|
| | n | 179 | 149 | 35 |
| ENERGY (kcal) | MEAN | 1989 | 2112 | 2412 |
| | MEDIAN | 1770 | 1955 | 2437 |
| PROTEINS (g) | MEAN | 101 | 94.3 | 101 |
| | MEDIAN | 85.7 | 76.2 | 88.6 |
| LIPIDS (g) | MEAN | 86.2 | 87.5 | 97.4 |
| | MEDIAN | 71.8 | 77.3 | 95.5 |
| SAT. FATTY ACIDS (g) | MEAN | 26.2 | 26.7 | 32.8 |
| | MEDIAN | 21.0 | 22.4 | 30.4 |
| MONOUNSAT. FATTY ACIDS (g) | MEAN | 38.1 | 39.8 | 41.6 |
| | MEDIAN | 29.2 | 30.1 | 33.1 |
| POLYUNSAT. FATTY ACIDS (g) | MEAN | 11.2 | 11.6 | 13.7 |
| | MEDIAN | 9.57 | 10.1 | 11.6 |
| LINOLENIC ACID (g) n-3 | MEAN | 2.76 | 2.52 | 2.51 |
| | MEDIAN | 1.74 | 1.50 | 1.49 |
| LINOLEIC ACID (g) n-6 | MEAN | 7.73 | 7.67 | 8.23 |
| | MEDIAN | 6.65 | 6.41 | 6.12 |
| CHOLESTEROL (mg) | MEAN | 342 | 347 | 375 |
| | MEDIAN | 266 | 257 | 255 |
| CARBOHYDRATES (g) | MEAN | 192 | 237 | 271 |
| | MEDIAN | 161 | 204 | 272 |
| DIETARY FIBRE (g) | MEAN | 6.49 | 7.84 | 11.2 |
| | MEDIAN | 4.73 | 6.48 | 9.96 |
| ALCOHOL (g) | MEAN | 7.83 | 4.07 | 13.0 |
| | MEDIAN | 0.00 | 0.00 | 0.00 |
| CALCIUM (mg) | MEAN | 399 | 474 | 636 |
| | MEDIAN | 326 | 333 | 657 |
| MAGNESIUM (mg) | MEAN | 190 | 201 | 281 |
| | MEDIAN | 160 | 182 | 244 |
| PHOSPHORUS (mg) | MEAN | 1182 | 1181 | 1445 |
| | MEDIAN | 986 | 1019 | 1293 |

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| | | PRIMARY | SECONDARY | POST-SECONDARY |
|---|---|---|---|---|
| POTASSIUM (mg) | MEAN | 1969 | 2287 | 3054 |
| | MEDIAN | 1674 | 1998 | 2891 |
| IRON (mg) | MEAN | 20.6 | 15.4 | 16.0 |
| | MEDIAN | 14.0 | 11.6 | 13.3 |
| ZINC (mg) | MEAN | 9.66 | 9.88 | 10.3 |
| | MEDIAN | 8.07 | 7.78 | 9.57 |
| SODIUM (mg) | MEAN | 2529 | 2418 | 3173 |
| | MEDIAN | 1553 | 2071 | 3169 |
| VITAMIN A ($\mu$gRE) | MEAN | 704 | 662 | 176 |
| | MEDIAN | 302 | 347 | 583 |
| CAROTENE ($\mu$gRE) | MEAN | 160 | 189 | 555 |
| | MEDIAN | 8.97 | 33.4 | 108 |
| TOTAL VITAMIN D ($\mu$g) | MEAN | 2.49 | 3.11 | 4.86 |
| | MEDIAN | 1.65 | 1.71 | 4.00 |
| VITAMIN E (mgET) | MEAN | 6.30 | 6.89 | 7.65 |
| | MEDIAN | 3.91 | 5.32 | 5.21 |
| VITAMIN C (mg) | MEAN | 45.5 | 68.9 | 111 |
| | MEDIAN | 14.3 | 29.5 | 67.5 |
| THIAMINE (mg) | MEAN | 1.45 | 1.37 | 1.64 |
| | MEDIAN | 1.22 | 1.05 | 1.39 |
| RIBOFLAVIN (mg) | MEAN | 2.03 | 1.83 | 1.99 |
| | MEDIAN | 1.69 | 1.45 | 1.79 |
| NIACIN (mgEN) | MEAN | 43.8 | 40.8 | 47.1 |
| | MEDIAN | 38.2 | 33.0 | 41.0 |
| VITAMIN $B_6$ (mg) | MEAN | 1.17 | 1.29 | 1.83 |
| | MEDIAN | 0.98 | 1.12 | 1.42 |
| FOLACINE ($\mu$g) | MEAN | 150 | 150 | 227 |
| | MEDIAN | 125 | 128 | 189 |
| VITAMIN $B_{12}$ ($\mu$g) | MEAN | 16.6 | 10.4 | 9.24 |
| | MEDIAN | 8.59 | 5.37 | 5.12 |
| PANTOTHENIC ACID (mg) | MEAN | 7.38 | 7.66 | 7.94 |
| | MEDIAN | 5.64 | 4.70 | 5.01 |
| CAFFEINE (mg) | MEAN | 317 | 267 | 416 |
| | MEDIAN | 237 | 189 | 258 |

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