

Eating Habits of Cree Schoolchildren: A Pilot Study

**Luce Bernard, P.Dt., M.Sc.
Claudette Lavallée, M.Sc.**

**Community Health Department
Montreal General Hospital**

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Department of Community Health
Montreal General Hospital

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SUMMARY

This study is part of efforts to promote healthy eating habits among the Cree schoolchildren of northern Quebec.

The general objectives of the study were the following: to develop and test both a questionnaire for evaluating food intake of the schoolchildren; and interview guides for identifying the factors influencing eating habits according to key-informants from the Cree communities; and to examine the relevance of using Body Mass Index (BMI) in the study of eating habits among these children. Two survey instruments were developed, pretested and used to describe the eating habits of 144 Cree schoolchildren aged 9 to 18 from two communities; to help identify the factors influencing their diet; and to study the relationship of children's Body Mass Index with their eating habits.

The findings of the study show differences between children and adolescents: younger children (9 to 11) eat better, do more physical exercise and watch less television. The BMI was considered useful and valid as a measure of obesity for the purposes of a food survey of this type. Obese subjects (38% according to the criterion selected) eat a less balanced diet, do less physical exercise, and spend more hours watching television than do non-obese subjects. Data obtained from adults consulted allowed us to identify more precisely and better understand the factors influencing the schoolchildren's eating habits. These informants also had a few suggestions to make: nutrition classes should be held on a regular basis in elementary school and continued at the secondary level; cooking classes in the school should be compulsory; nutrition should be taught to parents; more physical activities should be organized. Finally, recommendations are made for improving the research questionnaires.

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1 INTRODUCTION

1.1 SOCIAL RELEVANCE AND CONSULTATION

The priority of the project described here was jointly decided upon by the Cree Board of Health and Social Services, the northern Quebec Module, and representatives of the Cree communities.

During the Santé-Québec survey conducted in the summer of 1991 among the northern Quebec Cree, nutritional and food-intake data were collected from the adult population only. The few additional data we have on eating habits among the Cree were collected as part of studies also limited to adult populations (Foggin, 1986; Lavallée, 1990) or to the Chisasibi community (Fortin & Gray-Donald, 1984). Though this last study reports dietary inadequacies among schoolchildren, it does not provide a systematic description of food intake and eating habits for the whole school population, nor does it discuss their determinants. Moreover, there are no data available on the obesity of schoolchildren.

A survey providing reliable data on eating habits of schoolchildren and on the factors influencing these habits would therefore fill in an important gap in our knowledge. It would also serve as a basis for developing health promotion programmes adapted to the Cree population and aimed at preventing the premature development of chronic diseases. Children and adolescents between the ages of 9 and 18 represent close to 26% of the Cree population (MSSS, 1989). In Canada, these two particular groups, children and adolescents, have been selected as priority targets for health promotion activities (Health and Welfare Canada, 1988). This study constitutes the preparatory stage of a broader survey on all the Cree communities of northern Quebec.

1.2 OBJECTIVES OF THE STUDY

General Objective

The study's general objective was to develop instruments for describing eating habits and their determinants among schoolchildren between the ages of 9 and 18 in the Cree communities of northern Quebec.

Specific Objectives

- To develop and test instruments for evaluating the food intake of these schoolchildren.
- To develop and test instruments for identifying the factors influencing their eating habits.
- To examine the relevance of using a measure of weight relative to height in the study of eating habits.

2 BACKGROUND

2.1 PROMOTING A HEALTHY DIET

Over the past fifty years, there have been important changes in the evolution of matters related to health and disease (Health and Welfare Canada, 1990). With the decline of acute infectious diseases, we have witnessed a gradual rise in degenerative chronic diseases. The progress of medicine and improvements in the area of hygiene are partly responsible for this reversal of disease trends. However, only lately have we come to realize that environmental factors such as diet are linked to these chronic diseases (ibid).

Though it is not yet possible to quantify the relations existing between diet and degenerative chronic diseases, researchers are of the opinion that, at the population level, it would be possible to reduce the risk of disease by adopting certain dietary recommendations (Health and Welfare, 1990). But before formulating any such recommendations, the current situation must be documented. Eating habits develop in childhood (Vobecky & Vobecky, 1985) as does the tendency toward obesity (Health and Welfare, 1988). It is thus important to target the young when the goal is primary prevention.

2.2 EATING HABITS, OBESITY AND DISEASE

Lifestyles and eating habits have affected our diets which have changed more since the Second World War than during the preceding centuries (Vobecky and Vobecky, 1985). Associated with diet, among other things, chronic diseases are now responsible for more than 80% of deaths (ibid.). Obesity is also a known risk factor in high blood pressure, hyperlipidemia, diabetes, and, consequently, cardiovascular diseases (Health and Welfare, 1990). A higher frequency of gallstones is also observed in obese subjects than in non-obese subjects, as well as physical problems directly linked to overweight, such as joint problems, hernias, or respiratory problems (Hercberg et al., 1985).

Without denying the importance of genetic factors in the development of obesity (Health and Welfare, 1988; Hercberg et al., 1985), it is a known fact that eating habits and physical activity do have an effect on weight. It has been observed that obese subjects are often given to snacking; eating too much of a particular food; and bulimic attacks where food intake is not a response to physiological need but rather a psychological urge (Hercberg et al., 1985). Whether the cause or consequence of a weight problem, physical inactivity must also be taken into account (Health and Welfare, 1988). Finally, for certain experts, the obese subject is not necessarily someone who eats a lot, but rather someone whose "system for regulating energy reserves is either imbalanced or operating at an abnormal level" (Hercberg et al., 1985, p. 466). Elements causing such abnormality include genetic factors, environmental factors (such as an abundant and easily accessible supply of food), and certain triggers such as illness, surgery, or emotional problems (ibid.).

Eating habits do not, however, develop in a vacuum, but in a given economic, political, and sociocultural environment (Pelto, 1981). In a way, they represent "individual reactions to the cultural context; to commercial enticements; and to the availability of food" (Vobecky & Vobecky, 1985, p. 68). Data on societies having undergone rapid transformations are revealing on this point.

Many researchers have observed a close link between deterioration in the health of Pacific islanders and the rapid change in their lifestyles and diets (Hammett, 1987; Thaman, 1987; Schoeffel, 1987; Daniggelis, 1987). It is also believed that the near epidemic of dental diseases in some of these regions is linked not only to a lack of dental hygiene but also to high-sugar, low-fibre diets. (Thaman, 1987).

Transformation in the state of health of American Indians, who have also experienced rapid social changes over the last decades, has also been observed (Young, 1987a). Chronic diseases such as ischemic heart disease, high blood pressure, strokes, and diabetes are relatively recent in Canadian native populations (Young & Sevenhuysen,

1989). North American indian populations have a high prevalence of non-insulin-dependent diabetes mellitus (West, 1978; Young et al., 1990).

The survey of Indians conducted by Nutrition Canada in 1971 and 1972 (1975) reports deficiencies in certain nutrients and provides measures of energy intake. Several of the nutritional problems in native populations have also been linked to decreased consumption of traditional foods in favour of "White" eating habits (Smith, 1975). For example, "pick-up, open, and eat" foods seem to have a strong appeal to American Indians, (ibid., p.13).

2.3 SITUATION AMONG THE CREE

The state of health of the James Bay Cree is also a reflection of their history and environment (Robinson, 1988). Since the northern Quebec and James Bay Agreement was signed in 1975, particularly rapid changes in the Cree communities have led to growing outside influence. Among other things, the region has been witness to road construction; increased air traffic; access to television, running water, and sewage systems. Parallel to these rapid upheavals, the Cree's state of health changed. The incidence of infectious diseases is on the decline, whereas the prevalence of chronic diseases is on the rise (ibid.).

To quote a few figures on chronic health problems among the James Bay Cree, we may speak of the fact that, whereas treating diabetes is now an important part of medical practice, 10 or 15 years ago there were few diagnosed cases to be found (Robinson, 1988). A recent study (Brassard, 1991) shows an adjusted prevalence of 6.6% among those 20 years or older. From 1981 to 1985, the rate of hospitalization for endocrine diseases was almost twice as high among the Quebec Cree as in the Quebec population as a whole (Pelchat & Wilkins, 1986). Circulatory disease have become the second cause of death among the Cree (Courteau, 1989). Blood pressure levels are higher than in the general Canadian population (Foggin, 1986). The rate of obesity among adults is twice as high as that in the Canadian population (Lavallée, 1990), but we do not yet know

the prevalence and severity of the problem among school-aged children. Finally, a study conducted in the fall of 1983 on dental health among second-to-sixth-grade Cree schoolchildren showed that they had 20% more cavities than children in the general Quebec population (Payette, 1985, in Robinson, 1988).

These diseases observed among the James Bay Cree, with their inevitably high social and economic costs, are doubtlessly connected with the rapid environmental changes ushering in a different way of life and diet. Traditionally, the Cree practised a subsistence economy where the basic diet consisted of game, fish, wild berries, and Labrador tea (Berkes & Farkas, 1978). This was a diet rich in protein providing the necessary nutrients and calories (Sinclair, 1953 in Berkes & Farkas, 1978). Through contact with Whites, the Cree added flour, lard, and sugar to their traditional diet. Of little consequence at first, these changes gathered strength, with policies of compulsory schooling and concentrating native people in permanent settlements. This resulted in people becoming more sedentary and started a process of acculturation, which, on the one hand, limited the possibilities of practising the traditional economy and, on the other hand, encouraged the use of new commercial foods (Berkes & Farkas, 1978). A guaranteed income programme is now available to families of hunters and trappers who spend more than four months in the bush, and 30% of families take part in it (Cree Hunters and Trappers Income Security Board, 1989). The Traditional lifestyle and diet, therefore, still play an important role in the population.

Given this, the basic questions used in pursuit of the study's objectives were the following:

- 1) What is the diet of school-aged Cree children and adolescents?
- 2) What personal and community factors influence the eating habits of the schoolchildren?
3. Would it be possible to relate an obesity measure to the eating habits of Cree schoolchildren?

3 METHODOLOGY

3.1 SAMPLING

3.1.1 Choice of Schools

Chisasibi and Eastmain were selected for study from among the territory's eight communities. These two communities were chosen because of the number of their inhabitants, their accessibility, and the variety of grocery outlets available. Chisasibi is accessible by road and plane, and, in May 1991, its Cree population numbered 2, 569 (MSSS, List of beneficiaries). It is one of the largest Cree communities and one of the best supplied in terms of the quantity and quality of commercial food products.

On the other hand, Eastmain is accessible only by plane, except for the few winter months when the swamps freeze over and form a passable land route. At that time of year, truck traffic can reach large centres such as Val d'Or, Amos, or Matagami after a long day on the road. Eastmain thus remains isolated from the highway network for almost 10 months out of the year and, during that period, receives its commercial food supplies by plane. Not only does this mean higher costs but also a quantity and quality of food products inferior to that found in Chisasibi. These two communities are, more or less, representative of all the Cree communities in the territory. In 1991, Eastmain's Cree population stood at 422 (MSSS, List of beneficiaries).

The first contacts with schools of the villages selected were made by telephone. An explanatory letter was then sent to formalize agreements reached with the directors of the schools chosen.

3.1.2 Sampling Technique

Since the population targeted for study was composed of children and adolescents, we classified the subjects according to the age categories used in the Canadian Food Guide: those 11 years and under (children) and those between 12 and 18 (adolescents).

Subjects included in the sample would have to be at least 9 years old to ensure the validity of the 24-hour recall (Achterberg et al., 1990). The sample would also include a minimum of 60 subjects in each age group (children 9 to 11/adolescents 12 to 18) to provide a basis of statistical significance in comparing averages (Anderson, 1986; Emmons & Hayes, 1973).

Having obtained and examined school records listing children by date of birth and sex, we opted for a cluster sample so that the collection of data would disrupt class schedules as little as possible. We selected 4th and 5th grade classes at the elementary level and Secondary II and III at the upper level. These classes contained the largest number of subjects in the two age categories: 9 to 11 year olds and 12 to 18 year olds.

3.2 COLLECTION AND QUALITY OF DATA

To attain the study's objectives, two survey instruments were developed:

- 1) For the schoolchildren, an interview questionnaire, including a 24-hour recall and anthropometric measures;
- 2) For key community informants, a guide for conducting semi-structured interviews.

3.2.1 Interviews with schoolchildren

The interview questionnaire was designed to evaluate schoolchildren's food intake and determine the individual factors influencing their eating habits; it would also be used to record a measure of adiposity. In addition to the personal information (age, sex, weight, height) requested, the questionnaire devoted a section to data on the food intake of the day preceding the interview (24-hour recall) and on the average weekly intake of low nutrient-dense foods (junk food). Other sections were designed to obtain information on schoolchildren's lifestyles as well as on their preferences and knowledge in the area of diet (Questionnaire, Appendix II). Three questions were used to evaluate schoolchildren's level of physical activity. Question 17, where subjects make comparisons amongst themselves, is drawn from Sallis (1988), whereas question 16, which looks at all sports

or forms of physical activity, is adapted from Tell et al. (1988). We added question 15 on school gymnastics in order to capture all the relevant information.

The collection of data took place from 26 February to 1 April 1992 in Chisasibi and from 8 April to 24 April 1992 in Eastmain. The 24-hour recalls were conducted from Monday to Friday in a schoolroom made available for the purpose. schoolchildren were interviewed individually for about 30 to 45 minutes. Adjusting the interviews to class periods, it was possible to meet 5 to 7 schoolchildren a day.

Given the high rate of absenteeism among Chisasibi's Secondary II students and the tight schedules of some subjects involved in pre-exam review, we decided to enlarge the initial sample by including members of another Secondary II class. This brought the total sample to 171 subjects, divided between the two communities. In all, 163 schoolchildren were reached. However, for 19 of these subjects we have only the anthropometric measures, as they were absent when food-intake data were being collected. These cases have been excluded from the study.

We thus have for analysis a total of 144 subjects out of a sample of 171, for a participation rate of 84%. In Chisasibi, 104 schoolchildren (82%) participated in the study, whereas in Eastmain there were 40 (91%).

It is difficult to establish the precise profile of the schoolchildren who dropped out of the final sample. Some were absent without explanation and some because of illness; others were in the bush for an unknown period of time; others were preparing for exams; and, finally, others were away from the community participating in sports or other activities. Except for those participating in sports activities outside of the community (a total of 7 elementary schoolchildren), we have no reason to believe that the children who did not show up for the interviews were actually different from those who figure in the final sample.

The interview questionnaire was pretested with 12 primary and secondary schoolchildren in a Cree community (Whapmagoostui) which was not included in the sample. We then reworked the questionnaire to clarify some questions and/or modify their order of appearance, before translating it from English to French so that it could be used with schoolchildren in the French sector.

In the two communities selected, the interviews and anthropometric measures were done by the dietician accustomed to these types of interviews and measures. Interviews with schoolchildren had to be adapted to the respondent's level of comprehension, which varied depending on age, grade level, and mother tongue. The interviews were done in French or in English; occasionally in both languages; and, when necessary, with the assistance of a Cree interpreter.

We did only one 24-hour recall. Graduated, three-dimensional food models made of plastic and ceramic (homemade) were used to estimate the size of the portions eaten. Homemade styrofoam models were used to represent average portions of different kinds of meat. To cut down on errors from memory lapses, the interview contained extra questions about activities and places connected with eating, as suggested by Frank et al. (1977), as well as a list of foods against which to check the last 24 hours of intake.

3.2.2 Interviews with Key Informants

In order to obtain relevant data on the factors influencing the eating habits of schoolchildren, information was gathered from different groups of adults in each community: health professionals, parents, elementary and secondary teachers. Various exploratory interviews were held with these informants. (Interview guide, appendix II). The interviews were taped and then transcribed. We also collected relevant data on eating habits by participant observation during our stay in the communities and through informal discussions with various informants.

3.2.3 Anthropometric measurements

With the help of a local assistant, we first weighed and measured all the schoolchildren in the sample who were then present in a standardized manner (Weiner and Laurie, 1969). This approach seemed useful as it afforded an initial contact with the children; indirectly informed teachers that the study was beginning; and shortened the time needed for the subsequent interview.

A scale was used to obtain the weight of each child, rounded off to the nearest pound. The accuracy of the scale was checked with a standard weight and the zero readjusted, if necessary, before each session. The schoolchildren were weighed without shoes, lightly dressed, and with empty pockets.

Height was measured with children standing very straight and head in the Frankfort position. A height gauge was placed on the top of the subject's head and a mark made on the wall at that spot. The distance between this mark and an indelible line 100 cm from the floor was then measured with a tape. This distance was then added to the initial 100 cm. The measures obtained were rounded off to the nearest centimeter.

3.3 INDEX AND SCORES USED

The data were coded and checked by the dietician, with the help of a research trainee in nutrition from the University of Montreal. An independent firm was assigned the task of computerizing the raw data which the dietician then analysed using SPSS/PC+ software.

3.3.1 Food Quality Scores

Two measures were developed to describe diet in the 24-hour recall: a quality score and a quantity score. These scores were borrowed from Kant et al. (1991) who evaluated the various foods in the 24-hour recall of the National Health and Nutrition Survey II (NHANESII). For both scores, the term "serving" refers to quantities established by the

Canadian Food Guide (Health and Welfare, 1985), e.g. one serving of milk is equal to 8 ounces or its equivalent; a half serving is equal to 4 ounces or its equivalent.

The first measure, "**Food groups present**" is the qualitative score and counts the number of groups consumed from five food groups: Milk/Milk products; Meat/Substitutes; Bread/Grain; Fruits; Vegetables. This score evaluates the variety of foods contained in the 24-hour recall. Counting one point for each group consumed will give a minimum score of zero or a maximum score of five. We have considered a half serving as the minimum amount indicating the presence of a group. This seemed necessary to avoid giving credit for the presence of a particular food group in the schoolchild's daily diet when a tiny amount was reported.

The second measure: "**Servings Consumed**" or the quantitative score counts the desired number of servings of the different food groups in the 24-hour recall, meaning two servings of each of the following four groups: Milk/Milk products; Meat/Substitutes; Fruits; Vegetables; and four servings in the Bread/Grain group. A maximum of four points is credited for each of the five groups, for a maximum score of 20 points per day. Thus, each serving from a food group contributes two points to the total score, except for the Bread/Grain group where each serving contributes 1 point. Servings consumed in excess of these amounts are not considered.

In order to apply the stated criteria to each 24-hour recall, it was necessary to classify foods into the five different groups and mention the exclusions. The Milk/Milk products group excludes cream and butter. The Meat/Meat substitutes group includes animal or vegetable protein and fish. The Bread/Grain group excludes cakes, pastries, cookies, or pies. The Fruit group includes all fruits and fruit juices (fresh, canned, cooked), but not fruit-flavoured drinks. The Vegetable group includes all forms of vegetables (raw, cooked, canned). The ingredients of mixed dishes containing foods from different groups, e.g. spaghetti meat sauce, were assigned to their respective groups.

The "**Junk food**" measure, developed to assess the average daily intake of low nutrient-dense foods, uses questions about the frequency with which such foods are consumed. Five types of food are included in this measure: soft drinks, fruit drinks with added sugar, chips, chocolate bars, cakes, and pastries. By giving one point for each week/equivalent of 10 to 12 ounces of soft drink, 10 to 12 ounces of fruit drink, a small bag of chips, a chocolate bar or a piece of cake/pastry, it was possible to calculate a weekly "Junk food" average for each subject.

3.3.2 Body Mass Index

Since one of the objectives of the study was to examine the possibility of linking an obesity measure with eating habits, we decided to include the Quetelet or Body Mass Index (BMI).

There is no unanimous definition of obesity, and all indices have their limits. In adults, the BMI, $\text{weight (kg)/height (m)}^2$, is used as an anthropometric evaluation of body mass. A group of researchers having studied the validity of various weight/ height indices in estimating the adiposity in children and adolescents concluded that the BMI was the most adequate measure, within certain limits. In children and adolescents, adiposity will vary depending on age and sex and any anthropometric measure used with this population must take these parameters into account (Rolland-Cachera et al., 1983).

The literature reports work done by researchers who have taken the BMI (age and sex specific) reference values derived from the American NHANES (National Health and Nutrition Survey) and applied them to their own study population of children and adolescents (Malina et al., 1986; Gilbert et al., 1992; Muecke et al., 1992).

We have proceeded in a similar fashion. After having calculated the BMI for each subject, we compared the values obtained, by age and sex, with the NHANESII reference values in percentiles (National Center for Health Statistics, 1987). A BMI exceeding the 90th percentile in the subject's respective age/sex category was set as a criterion of obesity. We were thus able to divide the population into two groups: obese subjects,

those whose BMI exceeded the 90th percentile, and non-obese subjects, those whose BMI was equal or inferior to the 90th percentile.

3.4 STATISTICAL ANALYSES

Data from the interviews were analysed using simple and cross frequency distribution, chi square tests, means and Student's "t" test.

Information from the meetings with the various key-informants was not quantified. However, the information provided allowed for better understanding of the factors influencing the eating habits of schoolchildren. The focus group interview is not a substitute for the quantitative survey but serves rather to complement it. (Eng et al., 1990). Such groups are useful for exploring ideas or opinions without the constraints of a questionnaire (Crocket et al. 1990).

3.5 ETHICAL CONSIDERATIONS

At each stage of this project, we were careful to respect the confidentiality of the information gathered and the anonymity of the individuals involved. An identification number was assigned to each questionnaire and the names of the people encountered were not revealed.

The study was first explained to the school authorities and to the teachers concerned. The interviews were conducted once participants had given their consent. We explained the goals of the project and asked for permission to use the information gathered for research purposes.

4 RESULTS

4.1 DESCRIPTION OF PARTICIPANTS

Table 4.1 describes respondents. Ranging between 9 and 19, the average age of subjects was 12.4, with one 22-year-old participant. Since we were using a cluster sample, all the participants in the classes chosen were selected.

TABLE 4.1
Distribution of Chisasibi and Eastmain Participants,
According to Certain Characteristics, in %

Characteristics	Chisasibi n = 104	Eastmain n = 40	Total n = 144
<u>Age</u>			
9 - 11 years old	57,7	40,0	52,8
≥ 12 years old	42,3	60,0	47,2
<u>Sex</u>			
Boy	48,1	47,5	47,9
Girl	51,9	52,5	52,1
<u>Grade level</u>			
4 th grade	37,5	15,0	31,3
5 th grade	35,6	32,5	34,7
Secondary II	26,9	7,5	21,5
Secondary III	---	45,0	12,5
<u>Sector</u>			
French	70,2	52,5	65,3
English	29,8	47,5	34,7

As to grade level, one notes a large number of participants from Secondary III in Eastmain. This is to be explained by the very low enrollment in this small community's Secondary II. Most of the participants were also recruited from the French language sector, reflecting the fact that this sector has the highest enrollments.

4.2 WEIGHT AND HEIGHT OF SCHOOLCHILDREN

The schoolchildren's weight and height are expressed in terms of the BMI, as defined above. Table 4.2 shows that, based on the obesity criterion selected (BMI > 90th percentile), 55 schoolchildren in the sample (38%) are obese. Though one observes more corpulent subjects in the 12-years-and-over age bracket (especially among boys), there are no significant differences between age and sex groups. There also seems to be a greater tendency toward obesity in Eastmain than in Chisasibi, but, again, the difference is not significant. Only one subject fell below the 10th percentile threshold.

Using the 95th percentile as the threshold for obesity, the number of obese subjects falls to 17%. This time, the highest percentage of corpulent subjects is found among the girls: 24% versus 9% among the boys ($p < 0.01$).

These data must however be interpreted cautiously, for a number of different factors limit the validity of this classification. For one thing, the BMI tends to overestimate obesity when it is not used in conjunction with other anthropometric measures such as the tricipital skinfold (Malina et al., 1986). For another, there are ethnic variations in the distribution of adiposity, and the reference values used here come from a mainly Caucasian population.

TABLE 4.2

**Distribution of Certain Characteristics
Among Obese and Non-Obese Subjects, in %,**

Variables	Non-Obese BMI≤90th percentile	Obese BMI>90th percentile	N
<u>Total</u>	61,8	38,2	144
<u>Age</u>			
9 - 11 years old	68,4	31,6	76
≥ 12 years old	54,4	45,6	68
<u>Sex</u>			
Boy	55,1	44,9	69
Girl	68,0	32,0	75
<u>Community</u>			
Chisasibi	66,3	33,7	104
Eastmain	50,0	50,0	40
<u>Perception of body image</u>			
Too thin	100,0	0,0	5
Just right	75,9	24,1	83
A bit too fat	38,3	61,7	47
Much too fat	0,0	100,0	5
Don't know	100,0	0,0 ^{***}	2

*** p ≤ ,001 according to the chi square test.

1) Criterion of obesity: BMI above the 90th percentile according to the NHANES II reference.

With regard to perception of body image as screened by question 13, it is interesting to note that table 4.2 shows this perception to be strongly linked to obesity ($p < 0.001$). A majority of obese subjects (62%) perceive themselves as "a bit too fat," and, among the non-obese, a majority (76%) say they are "just right". The 5 subjects describing themselves as "thin" do, in fact, have a BMI that falls below the 80th percentile of the reference values. The 5 subjects who see themselves as "much too fat" have a BMI above the 90th percentile.

Thirteen percent of the subjects describe themselves as "a bit too fat" but, according to their BMI, actually are not overweight. More girls (15%) than boys (10%) are to be found in this category. In contrast, among those who find they are "just right" but are actually obese (14% of subjects), 20% are boys and 8% are girls. It should, however, be pointed out that, among young Cree, the term "big" or "fat" means practically the same thing.

The interviewer's physical evaluation (Question 42) is also strongly linked to obesity ($p < 0.001$); this perception is even more accurate than that of the subjects, if the criterion of a BMI exceeding the 90th percentile is maintained. As can be seen in table 4.3, these two variables "subject's perception of body image" and "interviewer's subjective evaluation of the subjects morphology" are also strongly linked ($p < 0.001$).

TABLE 4.3

**Distribution of Respondents According to Interviewer's
Physical Evaluation of the Subject and Subject's Perception of Own Body**

Interviewer Subject	Too thin	Just right	A bit too fat	Much too fat	Don't know	N Total
Too thin	-	4	-	-	1	5
Just right	3	70	9	-	-	82
A bit too fat	-	16	28	3	-	47
Much too fat	-	-	1	4	-	5
Don't know	-	2	1	-	-	3
Total N	3	92	39	7	1	142

Note: The association between the 2 variables is significant ($p < 0.001$).

4.3 DIETARY PROFILE

4.3.1 Quality of Schoolchildren's Diet

Using dietary scores and food groups based on Canada's Food Guide to Healthy Eating, we examined the quality of the schoolchildren's diet (section 3.3.1). Table 4.4 provides a comparison of the averages obtained by age, sex, and community.

As can be seen from the sample, the average number of servings consumed from each of the food groups coincides with the number of servings recommended in the Canadian Food Guide. However, comparing the younger subjects with the adolescents, we note that the former consume more foods from the Milk/Milk products group and the Fruit/Vegetables group than the latter, who do not eat enough foods from these groups. There is no marked difference between boys and girls. In contrast, the average consumption of meat is higher in Eastmain than in Chisasibi ($p < 0.05$).

With regard to the variety of foods consumed during the day evaluated (group score) and the desired number of servings (serving score), we also observe that the younger subjects have a better quality diet than the adolescents ($p < 0.001$). The 9 - 11 age group scores an average of 4.6 out of a total of 5 groups, whereas the adolescents score only 3.9. The younger subjects also have a serving score of 15 out of a total of 20, whereas this score is 13.6 for the adolescents. Here again there is no significant variation between boys and girls.

TABLE 4.4

**Servings Consumed by schoolchildren's Age, Sex and Community
Comparison of Means (\pm standard deviation)**

Variables	Total Population n = 144	Age		Sex		Community	
		9-11 y. o. n = 76	≥ 12 y. o. n = 68	Boy n = 69	Girl n = 75	Chisasibi n = 104	Eastmain n = 40
Canadian Food Group (Recommended servings):							
· Milk/Milk products (2-3)	2,0 (1,6)	2,5 (1,5)	1,4 (1,5)***	1,9 (1,6)	2,0 (1,5)	2,0 (1,4)	2,0 (2,0)
· Meat/Substitutes (2)	2,3 (1,4)	2,2 (1,2)	2,5 (1,5)	2,5 (1,5)	2,1 (1,2)	2,2 (1,3)	2,7 (1,5)*
· Fruits/Vegetables (4-5)	4,0 (2,4)	4,6 (2,5)	3,3 (2,2)**	3,6 (2,2)	4,3 (2,6)	4,1 (2,4)	3,7 (2,4)
· Bread/Grain (3-5)	7,2 (3,6)	7,0 (3,1)	7,2 (4,1)	7,6 (3,8)	6,8 (3,4)	7,3 (3,6)	6,7 (3,6)
Food group score ^(a)	4,2 (0,8)	4,6 (0,6)	3,9 (0,9)***	4,2 (0,7)	4,3 (0,9)	4,3 (0,9)	4,1 (0,8)
Serving score ^(b)	14,9 (3,4)	15,0 (2,8)	13,6 (3,7)***	14,7 (3,0)	15,1 (3,8)	15,1 (3,5)	14,3 (3,2)
Junk food score ^(c)	19,6 (9,2)	20,6 (8,8)	18,5 (9,5)	20,7 (9,0)	18,6 (9,2)	18,2 (7,8)	23,2 (11,2)**

a) Food group score: counts the number of food groups consumed during the day out of a total of five groups (Min= 0; Max=5).

b) Serving score: in each 24-hour recall, credits the presence of two servings each from the groups Milk/Milk products; Meat/Substitutes; Fruits; Vegetables and four servings from the Bread/Grain group. Four points are credited for each of these five groups, for a maximum score of 20.

c) Junk food score: evaluates the average weekly consumption of low nutrient-dense foods. Five junk foods are included (Min=0; Max= 45).

* p \leq ,05 ** p \leq ,01 *** p \leq ,001

Finally, there is no significant difference between the younger subjects and the adolescents when it comes to the "junk food" score which measures the weekly consumption of empty calories. This average is however higher in Eastmain (23.2) than in Chisasibi (18.2), ($p < 0.01$). The consumption of this category of snack foods ranges between 1.5 and 45 equivalents per week. In first place come fruit drinks ($\bar{x}=5.2$), followed by soft drinks ($\bar{x}=5.0$), chips ($\bar{x}=3.9$), cakes/pastries ($\bar{x}=3.1$) and chocolate ($\bar{x}=2.1$).

In table 4.5, it is interesting to note that dietary quality varies depending on the day evaluated ($p < 0.001$). We find a larger number of respondents with a high quality score (4 to 5 groups) on school days than on holidays. We also observe a higher percentage of schoolchildren with a high serving score (16 to 20 servings) on week days than on holidays.

Two questions, one direct and one included in the 24-hour recall, were asked to find out if the subjects ate breakfast every morning.

Question 23 was used to find out if subjects ate breakfast on school days, and less than half the schoolchildren (40%) reported regular breakfasts. Among those with "irregular" breakfasts on school days, we find more adolescents (78%) than younger subjects (43%). There is no difference between the sexes.

The 24-hour recall of the day preceding the interview also included a question asking if the subject had eaten breakfast on that particular day. A majority (79%) of subjects had eaten their breakfast on that day, 92% of the 9-to-11 year olds and 65% of the adolescents, with no significant difference between boys and girls. The definition of breakfast was that of the respondent. It included a minimum of one bowl of cereal or toasts. The findings show that quality of diet is better when subjects have breakfast. In table 4.5, we find that the largest numbers of subjects with high group and serving scores are to be found both among those who had breakfast on the day evaluated ($p < 0.001$) and among those who most often ate breakfast on school days ($p < 0.05$).

TABLE 4.5

**Distribution of Schoolchildren's Quality-of-Diet Scores
by Day Evaluated and Breakfast, in %**

Characteristics	N	<u>Quality Score</u>		<u>Quantity Score</u>		
		Groups present ^{a)} (2-3)	(4-5)	Servings Consumed ^{b)} (6-12)	(>12-16)	(>16-20)
<u>Day Evaluated</u>						
Week day	107	11,2	88,8	15,0	40,0	44,9
Holiday	37	37,8	62,2***	40,5	40,5	18,9***
<u>Breakfast (24-hour recall)</u>						
Yes	114	14,0	86,0	15,8	40,4	43,9
No	30	33,3	66,7**	43,3	40,0	16,7***
<u>No breakfast</u>						
(School days)						
< twice a week	45	15,6	84,4	20,0	28,9	51,1
twice & more/week	41	26,4	73,3	31,7	46,3	22,0*

- a) Quality score: counts the number of food groups consumed during the day out of a total of five groups (Min= 0; Max=5).
- b) Quantity score: in each 24-hour recall, credits the presence of two servings each from the groups Milk/Milk products; Meat/Substitutes; Fruits; Vegetables and four servings from the Bread/Grain group. Four points are credited for each of these five groups, for a maximum score of 20.

* p ≤ ,05 ** p ≤ ,01 *** p ≤ ,001 according to the chi square test.

In sum, this analysis of scores and food groups derived from the 24-hour recall and the "junk food" questionnaire reveals that younger subjects have a better quality diet than adolescents with regard to both variety and the desired number of servings. Moreover, schoolchildren eat better on school days than on holidays. And the quality of diet tends to be better among breakfast eaters. There is no noticeable difference between boys and girls, either with regard to the consumption of nutritious food or that of junk food. In contrast, Eastmain schoolchildren tended to eat more meat as well as more junk food than those in Chisasibi.

4.3.2 Description of Food Consumed

To get a more precise picture of the quality of the schoolchildren's diet, we also recorded an exhaustive list (appendix II) of all the foods consumed on the day recalled. This list does not take into account quantities consumed, but simply records and classifies into different groups the nutritious or junk foods present in the schoolchildren's diet. For the purpose of comparison, we have recorded separate lists for the Chisasibi sample (the community best supplied with commercial food) and the Eastmain sample (the most isolated community).

In the group Cakes/sweets/junk food, we notice the presence of a lot of sugar, used in tea and/or cereal, of fruit drinks, soft drinks, chips, gum with sugar, and cakes/pastries.

It is also possible to examine and rank the quality of foods within the different food groups. For example, we note the popularity of store-bought white bread in the Bread/Grain group. We also note that the cereals in the diet are usually refined.

In the Milk/Milk products category, we mainly find Grand Pré milk. When tea drinkers are excluded, the presence of Grand Pré milk declines considerably and that of Carnation milk is practically nil.

As regards meat, we mainly note the presence of pork chops, chicken, and steak, followed by game and fish. But, also to be mentioned are the many mixed dishes present in ready-to-eat, frozen, or canned foods but also in bush food.

Unfortunately, it was not possible to obtain systematically useful information from all the schoolchildren about the methods of cooking meat and fish. We thus noted only what the respondents knew. Data on Fats are thus limited to the presence/absence of butter/margarine on bread and the presence/absence of bacon with eggs. For lack of adequate information, we had to drop the various condiments from the list.

In the Fruit/juice category, we mainly note the presence of juices, followed by apples, oranges, and bananas. In the Vegetable group, we note French fries, followed by dehydrated potatoes. It appeared that French fries were most often deep fried or bought from the restaurant.

Noting the relative lack of whole-grain bread and cereals, leguminous plants, fresh fruits and vegetables in their diets, it would seem that the schoolchildren have few sources of dietary fibre. In contrast, we find good sources of Vitamin C in apple and orange juice, in oranges, and in the tomato sauce served with pasta. The low presence of yellow and dark green vegetables, served separately or in mixed dishes, leads us to fear a Vitamin A deficiency. But we also find this Vitamin in milk, tomato sauce, and game.

A review of the 24-hour recalls also allows us to make certain observations. As regards breakfast, most of the schoolchildren (97%) who eat breakfast do so at home; the others do so at the home of the grandmother or of a friend. A small group eat only one or two slices of bread with butter or margarine. The youngest subjects usually eat a bowl of cereal with milk. They sometimes add a fruit or a fruit juice, which gives an additional food group. The adolescents who eat breakfast tend to eat eggs with toast and a cup of tea, with or without milk/sugar.

Most of the schoolchildren (84%) eat lunch at home. Close to 10% eat at the restaurant or order take-out food. The others eat lunch at the home of the babysitter or the grandmother on school days, while a few rare subjects buy their lunch directly from the grocery store.

On the whole, considering only the greater variety of food groups present, the noon meal is more nutritious than the morning meal. Most of the schoolchildren eat either pasta dishes like Kraft dinner, homemade pasta with canned tomato or meat sauce (with or without bread), sandwiches, or fast foods such as pizza, hamburger, or poutine. Others eat a home-cooked meat dish with potatoes or other vegetables. The youngest subjects tend to drink more milk than the adolescents who mostly drink tea. The youngest

subjects also sometimes consume a fruit or a juice. This noon meal is often accompanied by fruit drinks (Tang/Kool-Aid) or soft drinks. A few children eat only a bag of chips and a soft drink or a cake, right in the store. A few others have a bowl of soup (from a package) and a few crackers at home.

For supper, there are very few "take outs" or restaurant meals (1%). Most of the schoolchildren eat this meal at home (96%). This evening meal seems to offer the greatest variety of foods, in terms of the five food groups. There is greater consumption of meat (commercial meat or game) with potatoes or sometimes other home-cooked vegetables and also of mixed dishes such as stews or pasta. There is often a dessert in the form of cake/pastries, ice cream, or fruit. Fruit drinks or tea (adolescents) are also often consumed.

The schoolchildren are observed to drink more tea ($n=97$) than coffee ($n=7$), and, as evaluated in the 24-hour recall, this consumption varies between 4 and 84 ounces per day. Milk and sugar are usually added to the tea or coffee.

4.3.3 Quality of Diet and Obesity

We examined the quality of the schoolchildren's diet as it relates to obesity. As can be seen in table 4.6, obese subjects are to be found mainly among children consuming fewer milk products ($p < 0.01$) or fruits/vegetables ($p < 0.05$). Obese subjects are also found among those with a poorer quality of diet, whether this applies to the diversity ($p < 0.01$) or number of nutritious servings consumed ($p < 0.01$).

If the Fruit/Vegetable category is split in two (Fruit/juice and Vegetables), we then note that obese subjects consume fewer fruits and juices ($p < 0.05$), but there is no difference in the average consumption of vegetables. In contrast, as concerns the quality of vegetables, we note that obese subjects eat more French fries per week ($p < 0.05$) than non-obese subjects.

We also examined the adolescent and younger groups separately. In the adolescent group, the link between quality of diet/obesity disappears, whereas in the younger group, it remains significant, with regard to both quality ($p < 0.01$) and quantity ($p < 0.05$).

TABLE 4.6
Servings Consumed by Obese and Non-Obese Schoolchildren
Comparison of Means (\pm standard deviation)

Variables	Total population	Non-Obese	Obese ¹
		BMI≤90 th percentile n = 89	BMI>90 th percentile n = 55
Canadian food groups			
· Milk/Milk products	2,0 (1,6)	2,3 (1,7)	1,5 (1,2)**
· Meat/Subtitutes	2,3 (1,4)	2,3 (1,4)	2,2 (1,3)
· Fruits/Vegetables	4,0 (2,4)	4,4 (2,5)	3,4 (2,2)*
· Bread/Grain	7,2 (3,6)	7,3 (3,6)	7,0 (4,0)
Food groups score ^(a)	4,2 (0,8)	4,4 (0,8)	4,0 (0,9)**
Serving score ^(b)	14,9 (3,4)	15,5 (3,1)	13,9 (3,7)**
Junk food score ^(c)	19,6 (9,2)	18,9 (8,9)	20,8 (9,4)
Fruits/Juice	1,9 (2,1)	2,2 (2,1)	1,4 (1,8)*
Vegetables	2,1 (1,4)	2,2 (1,4)	2,0 (1,4)
French fries/week	4,8 (3,3)	4,4 (3,4)	5,5 (3,4)*

- a) Food group score: counts the number of food groups consumed during the day out of a total of five groups (Min= 0; Max=5).
- b) Serving score: in each 24-hour recall, credits the presence of two servings each from the groups Milk/Milk products; Meat/Substitutes; Fruits; Vegetables and four servings from the Bread/Grain group. Four points are credited for each of these five groups, for a maximum score of 20.
- c) Junk food score: evaluates the average weekly consumption of low nutrient-dense foods. Five junk foods are included (Min=0; Max= 45).

* $p \leq ,05$ ** $p \leq ,01$ *** $p \leq ,001$

1) Criterion of obesity : BMI exceeding the 90th percentile according to the NHANES II reference.

4.4 LIFESTYLES

4.4.1 Consumption of Cigarettes and Alcohol

Cigarettes

We checked smoking with question 20. At the present time, 25% of respondents smoke. Among the 108 schoolchildren who are not smokers, 47% report having smoked occasionally. These ex-smokers are equally distributed among the younger age group and those 12 years and older.

Subjects who smoke consume from 1 to more than 90 cigarettes a week, with an average of 20. A larger number of girls (n=24) than boys (n=12) are to be found among the smokers. In contrast, boys smoke more than girls, with an average of 25 cigarettes a week versus 17 a week for the girls. Five 9-to-11 year olds are to be counted among the smokers. However, these subjects smoke on the average only 3 cigarettes a week. In sum, smokers are to be found mostly among the adolescents (86%) or secondary students (78%).

Alcohol

Question 41 was used to evaluate the consumption of alcohol. 36% of respondents report having already drunk alcohol. Half of these (n=26) had drunk alcohol during the last month and their consumption ranged between 1/2 and 54 drinks, with an average of 5. One drink is equal to a 12 ounce bottle of beer, 4 ounces of wine, or one and a half ounces of liquor.

Drinkers of alcohol are mainly to be found among those 12 years and older (47 out of 52 subjects or 90% of drinkers). A larger number of girls than boys (31 girls versus 21 boys) are also to be counted in this category. In contrast, as with the consumption of cigarettes, the boys consume more than the girls, with an average of 7 versus 4 drinks over the last month. For the five 9-to-11 year olds who had drunk during the past month, the average consumption was 1/2 drink. These five young subjects had started drinking at nine.

4.4.2 Television, Physical Activity, and Sleep

Television

We used question 14 to evaluate the hours spent in a week watching television , including videos or Nintendo games. Television viewing ranged between 2 to 28 hours per week, with a mean of 13 hours and a median of 12. As can be seen from table 4.7, the weekly average for the adolescents is higher than that for the younger subjects ($p<0.01$) and there is no marked difference between boys and girls. But we observe a significantly higher number of hours in Eastmain (a more isolated community) than in Chisasibi: an average of 14.8 versus 11.8.

Physical Activity

In response to question 15, subjects almost invariably answered once or twice a week. After checking with authorities, we discovered this meant twice every 6 days, if the children were present and if the physical education courses took place. As well, not all the children are equally active during these periods, some are even said to be quite passive. This question taken alone is thus not a good basis for classifying the schoolchildren in terms of physical activity.

TABLE 4.7

Lifestyle According to Schoolchildren's Age, Sex and Community
Comparison of Means (\pm standard deviation)

Variables	Total Population	Age		Sex		Community	
		9-11 y. o. n = 76	≥ 12 y. o. n = 68	Boy n = 69	Girl n = 75	Chisasibi n = 104	Eastmain n = 40
Television (Hours/week)	12,6 (5,1)	11,6 (4,4)	13,8 (5,7)**	13,0 (5,3)	12,2 (4,9)	11,8 (4,8)	14,8 (5,2)***
Physical activity (Times/week)	2,7 (1,4)	2,9 (1,3)	2,4 (1,5)*	2,9 (1,3)	2,5 (1,5)	2,9 (1,5)	2,3 (1,0)*
Hours of sleep (School days)	9,4 (1,1)	9,9 (0,7)	8,9 (1,1)***	9,2 (1,0)	9,5 (1,0)	9,4 (1,1)	9,3 (1,0)
Hours of sleep (Holidays)	10,3 (1,4)	10,4 (1,4)	10,0 (1,5)	10,0 (1,5)	10,4 (1,4)	10,4 (1,5)	9,9 (1,2)*
Cigarettes/week	20,1 (19,8)	2,6 (1,7)	22,8 (20,0)*	25,6 (25,5)	17,3 (16,1)	18,1 (17,0)	23,9 (24,9)

* $p \leq ,05$ ** $p \leq ,01$ *** $p \leq ,001$

When subjects compare themselves with others (Q 17), they place themselves in the following categories: "much more active" (3.5%); "more active" (17.5%); "about the same" (46.9%); "less active" (31.5%); "don't know" (0.7%). This question seemed difficult to several subjects who said they never compared themselves with others, then hesitatingly chose one of the statements. According to the Cree interpreter, several schoolchildren simply don't know the answer to this question. This classification thus also has its limits.

It was finally with question 16 that we had the most success. However, younger subjects or non-participants in organized sports such as ice hockey or broomball often found it hard to distinguish between extracurricular physical activity and that done at school. With the help of coaches and teachers from each community, we combined questions 15 and 16 in order to obtain a rough classification of subjects and reworded the statement as follows: "How many times a week, at school or outside of school, do you exercise (for at least a half hour) hard enough to sweat or get out of breath?"

Based on this interpretation, the frequency of physical activity varies between 0 and 7 times/week, with a mean of 2.7 and a median of 3. Subjects exercising from 1 to 2 times a week obtained a score of 1.5 and so forth for the other combinations. These data on physical activity must thus be interpreted cautiously.

We note in the same table that the younger subjects have a significantly higher mean (2.9) than the adolescents (2.4). There is no difference between girls and boys. But the weekly frequency of physical activity is higher in Chisasibi (2.9) than in Eastmain (2.3).

Hours of Sleep

We used questions 18 and 19 to examine the hours of sleep schoolchildren get. On school days, the schoolchildren go to bed at hours ranging from 9 PM to 2:30 AM, whereas on holidays, they go to bed later, anywhere from 10 PM to 5:30 AM. Similarly, they get up much earlier on school days (between 7 AM and 9:30 AM) than on holidays (between 6 AM and 4 PM). Those going to bed and getting up late are mainly

adolescents, which perhaps also partially explains why they don't eat breakfast before school.

Comparing the hours of sleep in table 4.7 reveals that, on average, the adolescents sleep fewer hours (8.9) than the younger subjects (9.9) on school days ($p < 0.001$). We also note that the schoolchildren sleep more on weekends. But there is no difference between the age or sex groups. However, Chisasibi schoolchildren sleep more than those in Eastmain ($p < 0.05$), possibly reflecting the fact that there are more adolescents in the Eastmain group (table 4.1).

To sum up, we note that the younger subjects watch less television; do more exercise; get more sleep; and smoke less than the adolescents. All these differences are significant, but there are no noticeable differences between boys and girls. And it is among those 12 years and older that we find the largest number of drinkers.

4.4.3 Lifestyles and Obesity

Certain variables were studied according to obesity among the schoolchildren. Table 4.8 reveals that obese subjects (BMI > 90th percentile) are mainly to be found among schoolchildren who spend more time watching television; do less physical activity; or get less sleep (whether on school days or on holidays). In these categories, all the differences with non-obese subjects are significant.

TABLE 4.8

Lifestyles of Obese and Non-Obese Schoolchildren
Comparison of Means (\pm standard deviation)

Variables	Total population	Non-Obese	Obese ¹
		BMI \leq 90 th percentile n = 89	BMI>90 th percentile n = 55
Televison (Hour/week)	12,6 (5,1)	11,6 (4,9)	14,2 (5,0)**
Physical activity (Times/week)	2,7 (1,4)	3,1 (1,4)	2,1 (1,3)***
Hours of sleep (School days)	9,4 (1,1)	9,6 (1,0)	9,1 (1,0)**
Hours of sleep (Holidays)	10,3 (1,4)	10,5 (1,4)	9,8 (1,4)**
Cigarettes/Week	20,1 (19,8)	20,6 (22,1)	19,2 (15,8)

* p \leq ,05 ** p \leq ,01 *** p \leq ,001

1) Criterion of obesity : BMI exceeding the 90th percentile according to the NHANES II reference.

In summary, this preliminary analysis shows interesting associations between the variables measured. Just as obesity appeared to be associated with the adolescents' eating habits, it also appears to be linked to some of their lifestyles. When the two groups (children and adolescents) are analyzed separately, the relationship physical activity/obesity remains significant for both younger ($p<0.01$) and adolescent ($p<0.01$) subjects. In contrast, the association television/obesity almost disappears.

4.4.4 Lifestyles and Quality of Diet

We examined some of the schoolchildren's lifestyles in relationship with quality of diet. These results are presented in table 4.9. As will be noted, the schoolchildren who watch more television have lower quality of diet scores ($p<0.05$) just as do those who exercise less ($p<0.01$).

TABLE 4.9

Lifestyles and Quality of Diet
Comparison of Means (\pm standard deviation)

Variables	Total population	Qualitative score		Quantitative score	
		Food group present ^(a) (2 - 3)	(4 - 5)	Servings consumed ^(b) (6 - 12)	(>12-16) (>16-20)
Television (Hours/week)	12,6 (5,1)	14,7 (6,0)	12,1 (4,8)*	14,2 (5,9)	13,1 (5,0) 11,2 (4,5)*
Physical activity (Times/week)	2,7 (1,4)	2,0 (1,4)	2,8 (1,4)**	2,1 (1,4)	2,6 (1,2) 3,1 (1,5)**

a) Food group score:

b) Serving score: counts the number of food groups consumed during the day out of a total of five groups (Min= 0; Max=5).
in each 24-hour recall, credits the presence of two servings each from the groups Milk/Milk products; Meat/Substitutes; Fruits; Vegetables
and four servings from the Bread/Grain group. Four points are credited for each of these five groups, for a maximum score of 20.* p \leq ,05 ** p \leq ,01

There is no significant association between the average consumption of junk food and quality-of-diet scores. This would seem to suggest that these foods do not replace nutritious foods.

In table 4.10, we note that there is no association between hours spent watching television or physical activity and the consumption of junk food. We do however note a certain tendency toward a higher consumption of such food among subjects who do little exercise or watch a lot of television.

TABLE 4.10
Lifestyles and Consumption of Junk Food
Comparison of Means (\pm standard deviation)

Variables	Total population	Junk food score⁽¹⁾		
		(0 - 14)	(15-22)	(23-45)
Television (Hours/week)	12,6 (5,1)	11,6 (5,0)	13,0 (4,6)	13,2 (5,7)
Physical activity (Times/week)	2,7 (1,4)	3,1 (1,6)	2,5 (1,3)	2,5 (1,3)

1) Junk food score: evaluates the average weekly intake of low nutrient-dense foods. Five types of junk foods are included: soft drinks; fruit drinks; chips; chocolate bars; cakes and pastries (Min = 0, Max = 45).

4.5 OTHER INFLUENTIAL FACTORS

4.5.1 Special Diets and Supplements

Only three subjects reported following a special diet. One child suffering from hyponatremia was on a permanent diet prescribed by the doctor. The two others were watching their diets, one for a few days (for a stomach problem) and the other for a few weeks (to lose weight). In both cases, the diets had been suggested by the doctor.

Close to 70% of the respondents from the elementary level take regular supplements of Fluor-a-Day. These tablets are distributed free of charge in elementary classes, but not all the children are willing to take them. Most of those who were taking them (88%) believed they were good for the teeth. The others did not know why they were taking them and gave no response.

A few rare subjects (6%) take other supplements such as Poly-Vi-Flor, Flintstones, or vitamin C. The few schoolchildren who explained the use of these tablets thought it was especially important to take them in winter or during vacation. Flintstone vitamins and mineral supplements were taken by the younger subjects, whereas Poly-Vi-Flor and vitamin C were consumed mainly by the adolescents.

4.5.2 Control over Food Preparation of Meals

Question 22 refers to the control different persons may exercise over what the subjects eat. This was an open question, and the many different answers have been broken down into groups. The total thus does not necessarily add up to 100%.

It is mostly mothers and/or the schoolchildren themselves who choose the food and prepare the meals (table 4.11). At breakfast, the schoolchildren are mainly in control (51%). In this group, we find 78% of the adolescents and 43% of the 9-to-11 year olds. We also note a higher percentage of girls (59%) than of boys (40%). At lunch or supper, the mothers are mainly responsible for choosing the food, but we also note a participation of fathers. As concerns snacks, the subjects make their own choices, except in a few rare cases where the mother or sister still exercises a certain authority. These cases are found among the elementary pupils.

TABLE 4.11

Control over Food by Type of Meal, in %

	Breakfast	Lunch	Supper	Evening snack	Snacks between meals
Subject	50,7	22,9	30,6	97,5	98,6
Mother	43,1	63,9	60,4	4,2	--
Father	4,9	8,3	12,5	--	--
Others	7,0*	16,1**	11,2***	--	4,2****

* including grandmother, sister, aunt, others.

** including sister, grandmother, babysitter, aunt.

*** including sister, grandmother, aunt.

**** including mother and sister.

4.5.3 Food Preferences

The schoolchildren's food preferences were expressed in response to question 27. As many as 74% of the respondents prefer to eat the same things their parents eat. In contrast, when asked about their friends' food choices, only 35% say they like to eat the same things. When the responses are examined by the age or sex of the respondent, they show no differences or particular trends. It is thus interesting to note that, no matter what their age or sex, subjects' food preferences appear to be more influenced by their parents (long-term preferences) than by their friends (short-term preferences).

Question 33 examined the preference between bush foods and food bought in the store. It was difficult to obtain a clear answer about length of stay in the bush with the question as it is now formulated. But with the help of teachers we were able to classify these stays roughly into three categories: (1) only during goose-break; (2) during the goose-break and occasional weekends; (3) during the goose-break and a prolonged indetermined period. In these different categories, we find, respectively, 47%, 44%, and 7% of the

respondents. Only 2% of respondents said they went into the bush only seldom and at irregular intervals.

Sixty-five per cent of the respondents say they eat better in the bush; 23% say they eat better at home; and 12% say they eat well in both places. The reasons for these choices are multiple: some of the schoolchildren gave broad answers; others were more specific and named particular foods. The spontaneous responses were grouped into four broad categories indicating: (1) a preference for bush foods; (2) a preference for foods from the store; (3) an equal preference for bush or store-bought foods; and, finally, (4) a preference for bush foods but with the comfort of home. In these categories, we find, respectively, 22%, 11%, 10%, and 4% of the respondents (see Appendix IV).

We note, among other things, that it is in Chisasibi, the community best supplied with commercial foods, that a higher percentage of respondents say they prefer foods from the store: 13% compared with 8% in Eastmain. Inversely, it is in Eastmain, the small isolated community, that a higher percentage of respondents spontaneously express a preference for bush foods: 30% compared with 18% in Chisasibi.

As concerns the foods named, the ten leading choices fall into the game and fish categories. Next come pasta, meats from the store (steak, canned stew), vegetables/potatoes, and fruit/juice. These choices reflect both preferences and the foods available locally. For example, we note the great popularity of caribou in Chisasibi (34%) as compared with Eastmain (3%) where this game is not to be found. The caribou eaten in Eastmain would probably come from a trade, a gift, or a recent trip to another community.

4.5.4 Knowledge, Information Sources, and Attitudes

Knowledge

Question 29 was aimed at determining what knowledge respondents possessed in the area of food/nutrition. It concerns the foods we should eat or drink. Some subjects

named categories of foods, others mentioned particular foods. The many different answers have been compiled and grouped in Appendix V.

Mentioned 164 times, the Fruit/Fruit juice category heads the list, followed by "Meat and Substitutes (114); Milk/Milk products (92); Vegetables (68); Grain (28); Mixed dishes (13); and Fast foods like hamburger, pizza (5). Fifteen respondents mentioned tea and a few subjects even mentioned cookies or coffee. It seems likely that the subjects providing the last answers either did not properly understand the question or confused preferred foods with healthy foods.

Looking at the prevalence of the particular foods mentioned, we note that 100 respondents mentioned fruits (or various fruit juices) with apples, oranges, and bananas heading the list; 75 respondents mentioned milk; and 63 subjects mentioned meat and game, naming goose, caribou, moose, and beaver as first choices.

Finally, 8 respondents said they did not know what foods "we should eat or drink." In contrast, even admitting that the question was not well understood by all subjects, we observe that the four food groups taught at school are reported here, either as a general category or as a specific food. The importance given to game in the "Meat and Substitutes" category must also be underlined.

Information Sources

We used question 24 (open) and questions 25 and 26 (closed) to verify sources of information on diet/nutrition. Since the study targetted schoolchildren, it seemed important to review the sources of information available in the school. However, after the pretest, the order of questions was reversed, meaning that we started with the closed questions, since answers to the open question were either slow in coming or absent.

Roughly half of the respondents (49%) say they get information on diet or nutrition from the community health representative (CHR) or a nurse (question 25). Among these

respondents, we find 60% of the 9-to-11 year olds and 36% of the adolescents, with no difference in the proportions of boys and girls.

A lower percentage (40%) say they get their information from their teachers (question 26). In this group, we find 40% of the 9-to-11 year olds and 33% of the adolescents with a slightly higher proportion of boys (42%) than girls (32%).

For the open question (24) on the different sources of information on diet or nutrition, the response rate is 72%. The different persons or sources mentioned in numerical order are as follows: mother, father, nurse, grandmother, sister, and biology books (see Appendix VI).

Attitudes

There were several questions allowing us to determine some of the schoolchildren's attitudes:

Self-Esteem

Question 21 was aimed at classifying respondents based on a self-esteem score. The hypothesis was that the subjects with high personal esteem might have better lifestyles and health habits than the others. The question contains statements on self-esteem adapted from the Study of Canadians' Attitudes and Behaviour with respect to Health (King et al., 1984-85). After having dropped 25 subjects who were not capable of self-evaluation or who found some of the statements unclear, we obtained results ranging from 0 to 6, with an average of 3.6. Though there is no significant difference between age or sex groups, girls did tend to have a lower average (3.3) than boys (3.9). There is no association between this finding and the variables measuring quality of diet, physical activity, or obesity.

Influence of Professionals

With respect to question 28 on health professionals' influence on the schoolchildren, the total number of respondents is limited to 65. Of these, 57% say they try to apply the

recommendations on diet made by the nurse or the CHR; there is no difference between the proportions of boys and girls. With regard to recommendations from teachers, 58% of the 43 respondents say they try to follow them, with a slightly higher percentage for boys (60%) than for girls (56%). It is mainly the 9-to-11 year olds who say they receive information from these resource people and also mostly the same respondents who say they try to put the recommendations into practice.

Benefits of Eating Well

The open question on the benefits of eating well (question 30) touched on both knowledge and attitudes. Only 25 schoolchildren answered this question. The others said they did not know or did not give an answer or simply did not understand the question. Eighteen of the 25 subjects explained their answer, and the reasons mentioned for eating well are grouped in five categories. In descending numerical order they are: health and well-being; growth; physical strength; concentration or studies; and bones or teeth.

Difficulty of Eating Well

Of the 49 schoolchildren who answered question 31 on whether or not it was hard to eat well, 33% answered in the negative, 33% in the affirmative, and 10% said "for me no, but for others yes;" the other subjects said they did not know. The rare subjects who explained their answers, mentioned the following elements as obstacles to eating well: food preferences, insufficient knowledge, or aversion to certain foods.

Importance of Eating Well

Question 32 on the importance of a good diet (a question touching on both knowledge and attitudes) drew a 99% response rate from the schoolchildren who said that it was: "very important" (38%); "important" (41%); "not very important" (18%) and "don't know" (3%). A smaller percentage (30%) offered reasons for their answers. In descending numerical order, the reasons mentioned were the following: health and well-being; growth; sports; physical appearance; concentration and studies; teeth and physical strength.

5 DISCUSSION

This discussion concerns the interpretation of the findings as they relate to the specific objectives of the study: eating habits of school-aged children and the factors influencing diet, and schoolchildren's Body Mass Index as it relates to their eating habits. The findings are interpreted in light of the comments made by informants. The advantages and limitations of the instruments used are then presented.

5.1 EATING HABITS INFLUENTIAL FACTORS

Using the Canadian Food Guide as the model for consumption and the 24-hour recall as the survey tool, this study reveals that, on the whole, Cree schoolchildren consume a sufficient number of servings from the different food groups. However, when the subgroups of children and adolescents are compared, we note that the younger subjects (9 to 11) have a better quality of diet than the adolescents, with no difference between the sexes. In particular, the average consumption of servings from the Milk/Milk products group and the Fruits/Vegetables group is rather low among the adolescents. Moreover, dietary variety as measured by the "food group" score is lower among the adolescents, indicating a less well-balanced diet than among the younger subjects.

The average consumption of servings from the Meat/Substitutes group appeared to be higher in Eastmain, the small isolated community, than in Chisasibi. Examination of the foods consumed in this category does not, however, allow us to say whether there is a higher consumption of game than of commercial meat. The higher consumption of meat is probably a reflection of the greater number of adolescents in the Eastmain sample.

The majority of schoolchildren spontaneously expressed a preference for bush foods over foods from the store. Compilation of the exhaustive list of foods consumed by schoolchildren does however reveal a predominance of foods bought from the grocery stores, restaurants, or convenience stores, with an abundance of refined cereals and precooked (frozen or canned) dishes. But there is also a noticeable presence of bush

foods. The great popularity of Grand Pré milk among the younger subjects is mainly linked to existence of the school's Milk Programme. Grand Pré and Carnation milk are heavily used in northern Quebec because of their long shelf life.. The consumption of coffee is almost nil, but that of tea is rather high.

In both communities, informants agree that the younger subjects consume more fruits and vegetables than their parents, though fruits and vegetables "are very expensive" as is meat. In Chisasibi, the health workers have noted in the last years a greater availability of fresh foods, as well as a greater variety of fruits and vegetables. In Eastmain, on the other hand, an informant mentioned the lack of a variety of fresh produce in the grocery stores. A fifty-year-old Cree woman from that community says she never eats vegetables and only rarely eats food products from the store. This informant does however add that the younger generation is very different. According to another informant, potatoes are the vegetables most often eaten, which confirms our findings with the schoolchildren. Regardless of differences in the level of food availability, juices and French fries appear to enjoy the greatest popularity among the schoolchildren, both in Chisasibi and Eastmain.

Junk food consumption (evaluated with the questionnaire on frequency of consumption) consists mainly in a large quantity of sweetened, fruit-flavoured drinks, soft drinks, and chips. The consumption of this category of foods appeared very high in Eastmain, which is less well supplied with nutritious commercial foods. We did not check dental health in relation to the consumption of sweets, including chewing gum with sugar which is so popular in both communities.

There are different factors favouring the consumption of junk food. For one thing, these foods are abundantly available in the communities and easily accessible (grocery stores, convenience stores, restaurants); there are many opportunities to eat these foods; and the young people almost always have pocket money which they get from the grandparents when they cannot get it from their parents (various informants). For

another, while there is adult control over the preparation of meals, most children have exclusive say over what they buy for snacks.

It is mainly after school and in the evening that the schoolchildren seem to buy and eat junk food. During feasts, ceremonies, and marriages, traditional foods are usually served. In contrast, during sports competitions, amateur evenings, gatherings (Bingo nights, dance contests), it is common to see young people come back from the dépanneur with bags full of chips, soft drinks, and chocolate (Chisasibi informant).

Given the relative lack of parental control over what young people buy Cree parents say "all they can do is make sure healthy foods are available". "We have to pressure the owners of food stores to stock a wider variety of fresh, healthy foods" (Eastmain informant).

Various researchers have studied the importance of breakfast in different populations. Eating breakfast is said to improve the school performance of children from lower socio-economic environment (Nadeau & Cotnoir, 1992). Other researchers seem to think the absence of breakfast might have a negative effect on problem-solving skills, even among the best nourished subjects (Bidgood, 1992). A cut in food intake such as omitting breakfast may contribute to the development of eating disorders such as anorexia and bulimia (Welch et al., 1992). Finally, participation in a school breakfast programme has been associated with better learning performance, reduced levels of absenteeism or tardiness, and better learning behaviours (Bidgood, 1992).

The findings of the present study reveal that more than half the subjects (mostly adolescents) eat breakfast before school only irregularly. The 24-hour recall gives a more conservative figure: 21% of the schoolchildren had not eaten breakfast on the day recalled. We also know that, among the subjects, it is adolescents who exercise the greatest control over the preparation of this meal. The schoolchildren who eat breakfast have a better quality of diet than those who skip breakfast. Moreover, the schoolchildren

eat better on school days than on holidays, possibly a reflection of the more regular hours kept on school days when schoolchildren tend to go to bed and get up earlier.

Cree tradition consists in preparing food and leaving it on the electric stove (Cree informers). If the schoolchildren do not eat or eat irregularly "it isn't because there is no food." As parents, it is simply "hard to keep tabs on young people:" "We can't force them to eat if they say they're not hungry." In this respect, it is interesting to note that the adolescents, who tend to get up late, often have a snack before going to bed. In addition to being rushed in the morning, perhaps they don't feel hungry before school.

There is currently no breakfast programme at school. However, in Chisasibi, the school cafeteria is open to secondary students who can buy a snack (bread, cheese, peanut butter, juice, tea, coffee, milk...) during the morning recess. In Eastmain, which does not have a school cafeteria, children may bring various snacks to school. For elementary pupils in both communities, the Milk Programme provides a minimum of 5 ounces of 2% milk in the morning.

This study also reveals that the younger children (9 to 11) do more physical exercise and watch less television than the adolescents. With regards to lifestyles, we observe an inverse relationship between the hours spent watching television (including videos) and the dietary quality scores. We also observe a certain tendency toward greater consumption of junk food associated with more television viewing. An association was also noted between subjects who exercise less and those who have lower dietary quality scores.

We did not however find any association between the consumption of junk food and quality-of-diet scores (diversity or servings consumed). Consequently, it seems that it is not for lack of eating enough nutritious foods that children eat more junk food.

5.2 BODY MASS INDEX AND EATING HABITS

Using the criteria indicated above, we obtained a high percentage of obese subjects (38%), with no significant differences between sex, age, and community groups. By way of comparison, among Navajo adolescents between the ages of 14 and 18, 33% of the girls and 25% of the boys are found to be obese when using the 85th (rather than the 90th) percentile of the same reference values (Gilbert et al., 1992). Among these Navajo adolescents, adiposity tends to be concentrated in the trunk area. It is becoming more and more apparent that this type of distribution is a risk factor in several chronic diseases, including high blood pressure, cardiovascular disease, gall stones, diabetes, and certain forms of cancer (Anon., 1992).

Researchers have recently observed a clear secular trend toward obesity in children and adolescents (Gortmaker et al., 1990). It seems that the probability a young obese subject will become an obese adult is linked to the length, level, and persistence of obesity in late adolescence (Gortmaker et al., 1990). Rolland-Cachera et al. (1983) also point out that "in surroundings with traditionally high levels of consumption, a greater number of obese children are to be found," possibly reflecting the fact that a plump figure is desirable or more acceptable.

This study has also shown that obese subjects did less exercise and spent more hours in front of the television than did non-obese subjects. Moreover, obese subjects had a less varied diet and consumed fewer servings of nutritious foods than the non-obese. The diets of the former tended to lack fruits or fruit juices and milk products. The weekly consumption of French fries was also significantly higher among the obese than among the non-obese. The nature of the data collected did not permit measurement of the average fat and calory content.

Gortmaker et al. (1990) point out the importance of "inactivity" in the development of obesity and consider television a risk factor in children and adolescents. Reduction of physical activity causes a drop in lean body mass (one of the determining factors in the

rate of basal metabolism) and results in lower energy needs. Strictly speaking, the prevalence of obesity could increase without changing energy intake. These researchers have observed a causal relationship between the time spent watching television (a form of inactivity which may influence food intake) and the prevalence of obesity. They conclude that a multifactorial approach is needed to combat the "epidemic of obesity". This would include a balanced diet, physical exercise, and restrictions on television time or other sedentary activities.

If Chisasibi schoolchildren are more active than those in Eastmain, this is possibly because the former community is much more developed in the area of organized sports. Moreover, the survey took place during the school year when there are more organized sports of all kinds in Chisasibi. In the summer, there would be few organized physical or sports activities for the young, a lack that many deplore.

When the factors associated with obesity are studied separately for the two subgroups (children and adolescents), we find that the physical activity/obesity link remains significant for both groups; that the dietary quality/obesity link remains significant only for the children; and that the television/obesity link almost completely disappears for adolescents. We may thus believe that the factors linked to obesity behave differently from one age group to the other and that this dichotomy should be maintained in any future study.

5.3 ADVANTAGES AND LIMITATIONS OF THE INSTRUMENTS USED

The limitations of the BMI, as the only measure of obesity, prevent us from determining its distribution. To do so, we would have to explore the use of an additional anthropometric measure such as waist and hip ratio or the subscapular fold. With the BMI it is also impossible to clearly distinguish between obese subjects and subjects with heavy muscle or bone mass (Dietz, 1987; Garn et al., 1986). However, the various associations observed between physical activity, lifestyle, perception of body image and obesity lead us to believe that the BMI (an easily applied measure) may be valid for the purposes of

a dietary survey of this type. Finally, given its high correlation with total adiposity (Gilbert et al., 1992), the BMI may be considered as a tool for detecting obesity.

With the 24-hour recall and the food frequency questionnaire, it was possible to evaluate the schoolchildren's patterns of dietary consumption. The supplementary questions addressed to the schoolchildren and the focus groups with adult informants helped in identifying the determinants of eating habits. Except for some schoolchildren who seemed to confuse favourite foods with healthy foods, most of the subjects could spontaneously name the nutritious foods one "should eat or drink."

In contrast, the different open questions about the benefits, difficulties, or importance of eating well, though revealing as concerns knowledge about nutrition and its importance, drew only few clearly explained responses. While taking into account the apparent difficulty Cree schoolchildren have answering open questions of this type, it should be pointed out that the exposure to nutrition education in schools is rather limited.

The community health representative (CHR) is usually the person in charge of the nutrition programme in the schools. This programme is prepared in collaboration with the regional nutritionist who has the responsibility for the nutrition programmes in all the eight Cree communities. At present, nutrition activities are taught only in the elementary grades. As well, these activities, which take place only 2 or 3 times a year (depending on the classes), are not part of the school curriculum. The dental hygienist also visits the schools at least twice a year and talks about healthy snacks with groups of elementary pupils. Finally, no CHR has been employed at the Eastmain Clinic for several years.

As for secondary students, information about nutrition is mainly given in biology courses. More recently, given the fact of teenage pregnancies, the dental hygienist has started talking to these same students about "baby bottle syndrome." At the time of the study, the dietary or nutrition content of home economic courses was limited to the cooking of bannock or other baked foods.

In light of these facts, it is understandable that the elementary pupils are most capable of answering the questions about the influence of health workers or teachers in the area of nutrition. And the fact that boys receive information and advice about nutrition from their school coaches explain why they are more influenced by teachers than girls. (This information was provided by certain schoolchildren).

Finally, throughout the study, various comments and suggestions from the informants consulted helped us better identify or understand the factors influencing the schoolchildren's eating habits. In Appendix 1, the reader will find more detailed recommendations about use of the pretested instruments applied during this study.

6 CONCLUSION

In this pilot project, our specific objectives were to develop and test questionnaires for evaluating the diet of Cree schoolchildren; identifying the influential factors related to eating habits; and examining the relevance of using Body Mass Index in the study of eating habits.

The findings from the questionnaire used with the schoolchildren allowed us to describe the eating habits of the school-aged population and to determine some of the factors influencing these habits. We were thus able to observe the differences between the children and adolescents with regard to dietary quality, physical activity, and hours spent watching television. In particular, the younger subjects (9 to 11) eat better; participate more frequently in physical activity; and watch less television.

The Body Mass Index (BMI) made it possible to classify subjects as obese or non-obese. Even with the limitations of this measure, the study was able to discover that obese subjects ate less well-balanced diets; participated less frequently in physical activity; and spent more hours watching television than non-obese subjects. Changes in lifestyle in these communities may have made people more sedentary and more likely to become obese.

We also observed an association between the perception of body size and real obesity. On this point, it is interesting to note the comments of one Cree informant: "Young people are very concerned about their physical appearance, in my day, it wasn't like that."

Furthermore, the adjustments required by changes in food supplies need further investigation. In a world where game and fish were once abundant and free and where vegetables were practically nonexistent, it is not easy to decide what food to buy and eat. Yet, if everything in the stores and restaurants seems expensive, this may be due to the heavy consumption of precooked and fast foods, which are by definition more expensive.

Moreover, if the schoolchildren are consuming junk food to the detriment of nutritious foods (something the present study did not demonstrate), this means an investment in empty calories.

Added to the real problem of budgeting to buy healthy foods is the lack of dietary knowledge and cooking skills, especially among the younger generation. This lack was mentioned by many Cree informants who suggested information workshops on the subject, as well as cooking classes. Various informants also had other suggestions or comments to make: nutrition should be taught on a regular basis in the elementary grades and continued at the secondary level; cooking should be a compulsory school subject; nutrition should be taught to parents; and more physical activities should be organized. Young mothers, athletes, and sports enthusiasts need information on nutrition.

Finally, this pilot project reveals that, in order to fight increased obesity among Cree schoolchildren, several things are needed: early education in nutrition; use of a multidimensional approach, including balanced diet, physical exercise, and restrictions on sedentary activities such as watching television. Given the different social and environmental factors linked to schoolchildren's eating habits and lifestyles, the whole community (schoolchildren, teachers, parents, merchants, health workers, political leaders...) should join in a common effort. In sum, it is a question of "enabling the whole population to choose the foods needed to maintain health." (Campbell, 1992).

REFERENCES

- Achterberg, C., Pugh, M.A. et al. 1990. Feasibility of telephone interviews to collect dietary recall information from children aged 8-10 years. Fed. Amer. Soc. Exp. Biol. A786, Abstract #4597.
- Anderson, S.A. 1986. Guidelines for use of dietary intake data. Report prepared for the Food and Drug Administration under Contract No. 223-84-2059 by the Life Sciences Research Office, Federation of American Societies for Experimental Biology, Bethesda, MD.
- Anon. 1992. The epidemic of obesity in American Indians. A.J.D.C. vol. 146: 285. (Editorial)
- Baranowski, T., Dworkin, R. et al. 1986. The accuracy of children's self-reports of diet: Family Health Project. J.A.D.A. vol. 86: 1381-1385.
- Berkes, F., Farkas, C. 1978. Eastern James Bay Cree Indians: changing patterns of wild food use and nutrition. Ecol. Food. Nutr. vol. 7: 155-172.
- Bidgood, B.A. 1992. Meal/snack missing and dietary adequacy of primary schoolchildren. J.Can.Diet.Ass. vol. 53 (2): 164-168.
- Brassard P. 1991. Diabetes in the James Bay Cree Communities of Quebec. Department of Epidemiology and Biostatistics, McGill University.
- Bruss, M. ed. 1987. The Pacific Conference: Nutrition Challenges in a Changing World: Proceedings. Hawaii: University of Hawaii, July 13-14.
- Campbell, C. 1991. Food security from the consumer's perspective: An agenda for the 1990's. J.Can. Diet. Ass. vol. 52 (2): 83-88.
- Courteau, J.P. 1989. Mortality among the James Bay Cree of northern Quebec: 1982-1986. Department of community health, Montreal General Hospital.
- Cree Hunters and Trappers Income Security Board. 1989. Annual report 1988-1989.
- Crocket, S. J., Heller, K. E., et al. 1990. Assessing beliefs of older rural Americans about nutrition education: Use of the focus group approach. J.A.D.A. vol.90 (4): 563-567.

Daniggelis, E. 1987. Cash fishing and subsistence plantations: The impact of a global economy on Samoan children's growth. in:Bruss, M. (ed.). Proceedings of the Pacific Conference: Nutrition in a changing world. Hawaii, July 13-14 1987: pp. 130-135.

Dietz, W.H. Jr. 1987. Childhood obesity. Ann. N.Y. Acad. Sci. vol 499: 47-54.

Emmons, L. & Hayes, M. 1973. Accuracy of 24-hr. recalls of young children. J.A.D.A. vol. 69: 409-415.

Eng, E., Glick, D., and Parker, K. 1990. Focus-group methods: effects on village-agency collaboration for child survival. Health Pol. & Planning. vol. 5 (1) 67-76.

Foggin, P., Lauzon, H. 1986. Health status and risk factors: The Cree of northern Quebec: Preliminary Report. Université de Montréal: Département de géographie.

Fortin, P., Gray-Donald, K. 1984. Food habits of the Cree Indians living in Chisasibi. Montreal General Hospital, Community Health Department.

Frank, G.C., Berenson, G.S. Schilling, P.E. & M. Moore. 1977. Adapting the 24-hr. recall for epidemiologic studies of schoolchildren. J.A.D.A. vol.71: 26-31.

Garn, S.M. Leonard, W.R. et Hawthorne, V.M. 1986. Three limitations of the body mass index. Am. J Clin Nutr.44: 996-997.

Gilbert, T.J., Percy, A. et al. 1992. Obesity among Navajo adolescents: relationship to dietary intake and blood pressure. A.J.D.C. vol. 146:289-295.

Gortmaker, S., Dietz, W.H., Cheung, L.W.y. 1990. Inactivity, diet, and the fattening of America. J.A.D.A. vol. 90 (9):1247-1255.

Green, L.W., Kreuter, M.W., Deeds, S.G. & Partridge, K.B. 1980. Health Education Planning: A Diagnostic Approach. Mayfield Publishing Co. Mountain View, California.

Hammett,M. 1987. Economic, and political trends with implications for health and nutrition. in: Bruss, M. (ed.). Proceedings of the Pacific Conference: Nutrition in a changing world. Hawaii, July 13-14 1987: pp.18-21.

Health and Welfare, Canada. 1985. Canada's Food Guide to Healthy Eating (Revision). Ministry of Supplies and Services, Ottawa, Canada, 1988.

Health and Welfare, Canada. 1988. Promoting Healthy Weights : A discussion paper Ministry of Supplies and Services, Ottawa, Canada.

Health and Welfare, Canada. 1990. Nutrition. The Report of the Scientific Review Committee. Ministry of Supplies and Services, Ottawa, Canada.

Hercberg, S., Dupin, H., Papoz, L. & P. Galan. 1985. Nutrition et santé publique: Approche épidémiologique et politiques de prévention. Paris: Technique et Documentation-Lavoisier.

Jenner, D.A., Neylon, K. et al., 1989. A comparison of methods of dietary assessment in Australian children aged 11-12 years. Eur. J. Clin. Nutr. vol. 43: 663-673.

Kant, A.K., Block, G. et al. Dietary diversity in the US population, NHANES II, 1976-1980. 1991. J.A.D.A. vol.91 (12): 1526-1531.

Kemm, J. R. 1987. Eating patterns in childhood and adult health. Nutr. & Health. vol. 5 (4): 205-215.

King, A.C.C., Robertson, A.S. and Warren, W.K. Etude sur les attitudes et les comportements des Canadiens en matière de santé: Elèves âgés de 9, 12 et 15 ans, 1984-85. Résultats pour le Québec. Queens University, Kingston, Ontario.

Lachapelle, D. Couture, C. et al. 1990. The effects of nutritional quality and frequency of consumption of sugary foods on dental caries increment. Can. J. Publ. Health. vol. 81 (sept/oct): 370-375.

Lavallée, C. 1990. Lifestyles and physical activity among the James Bay Cree. Department of community health, Montreal General Hospital.

Malina, R.M, Zavaleta, A.N. et Little, B.B. 1986. Estimating overweight and obesity in Mexican American schoolchildren. Int.J. Obes. 10: 483-491.

MSSS. 1991. List of beneficiaries. May 1991.

Muecke, L., Simons-Morton, B. et al. 1992. Is childhood obesity associated with high-fat foods and low physical activity? J.Sch.Health. vol.62 (1):19-23.

Nadeau, M.H., Cotnoir, B. 1992. Problèmes nutritionnels et performance scolaire en milieux défavorisés. Diét. en action. vol. 6 (1): 6,8,10.

National Center for Health Statistics, 1987. Anthropometric Reference Data and Prevalence of Overweight: United States, 1976-80. U.S. Department of Health and Human Services.

- Paquette, M. 1986. Influence de l'environnement communautaire de deux milieux socio-économiques sur la consommation de friandises chez les jeunes. Thèse de maîtrise. Université Laval.
- Pelchat, Y., Wilkins, R. 1986. Fréquentation hospitalière de la population autochtone de la Baie James de 1981-82, 1984 à 85. Department of community health, Montreal General Hospital.
- Pelto, G.H. 1981. Anthropological contributions to nutrition education research. J. Nutr. Educ. vol. 13: Suppl. S2-S8.
- Robinson, E. 1988. The health of the James Bay Cree. Can. Fam. Phys. vol. 34 (July): 1606-1613.
- Rolland-Cachera, M.F. et al. 1983. Estimation de l'adiposité chez l'enfant. Cah.Nutr. Diet. 18 (6): 306-310.
- Rolland-Cachera, M.F. et al. 1983a. Relation entre alimentation et corpulence chez l'enfant. Cah.Nutr. Diet. 18 (6): 310-311.
- Rolland-Cachera, M., F. Sempé, M. Guillaud-Bataille, M. et al. 1982. Adiposity indices in children Am J Clin. Nutr. 36:178-184.
- Roy, L. , Bouchard, L. 1985. Le point sur les habitudes de vie: L'alimentation. Québec:Conseil des affaires sociales et de la famille. 95 pages.
- Sallis, J.F., Patterson, T.L. et al. 1988. Relation of cardiovascular fitness and physical activity to cardiovascular disease risk factors in children and adults. Am. J. Epid. vol. 127 (5):933-941.
- Schoeffel, P. 1987. Food and nutrition, social change, and devevopment in the Pacific Islands: A critical review. in: Bruss, M. (ed.). Proceedings of the Pacific Conference: Nutrition in a changing world. Hawaii, July 13-14 1987: pp. 102-122.
- Scipien, G. & Barnard, M.U.. 1987. Editorial. Issues in Comprehensive Pediatric Nursing. vol. 10 (2): iii.
- Seoane, N. A. & Coulombe, R.H. 1985. Les habitudes alimentaires des jeunes Québécois: Rapport d'enquête. MAPAQ. (Rapport de l'enquête réalisée conjointement par: la Direction des politiques alimentaires, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, et Les Cercles de Fermières du Québec).

Smith, M.G. 1975. "Food resources and Changing Dietary Patterns of the Canadian Indian Child" in Nutrition of Indian and Eskimo Children. Montreal: Report of the Second Canadian Ross Conference on Paediatric Research Ross Laboratories.

Story, M., Tompkins, R.A. et al. 1986. J.A.D.A. vol. 86 (11): 1555-1560.

Tell, G.S. & Vellar, O.D. 1988. Physical fitness, physical activity, and cardiovascular disease risk factors in adolescents: The Oslo youth study. Prev. Med. vol. 17: 12-24.

Thaman, R. 1987. Food, fortune, and fatality: Economic, social, and nutritional challenges of the urbanization of Pacific islands. in: Bruss, M. (ed.). Proceedings of the Pacific Conference: Nutrition in a changing world. Hawaii, July 13-14 1987: pp. 32-76.

Vobecky, J.S. and Vobecky, J. 1985. Les habitudes alimentaires et leur rôle dans la promotion de la santé. Union med. Can. tome 114: 68-73.

Weiner J.S., Laurie J.A. Human Biology a Guide to Field Methods. IBP Handbook No. 9, Blackwell Scientific Publications, Oxford and Edimburgh, 1969, pp.7-15.

Welch, T., Nidiffer, M., et al. 1992. Attributes and perceived body image of students seeking nutrition counseling at a university wellness program. J.A.D.A. vol. 92 (5): 609-611.

West, D. M. 1978. Diabetes in American Indians. Adv. Metab. Dis. vol. 9:29-48.

Young, T.K. ed. 1987a. Diabetes in the Canadian native population: Biocultural perspectives. Toronto: Canadian Diabetes Association.

Young, T.K. 1987b. northern Indian chronic disease study. University of Manitoba: Department of Community Health.

Young, T.K., Sevenhuysen, G. 1989. Obesity in northern Canadian Indians: patterns, determinants, and consequences. Am. J. Clin. Nutr. vol. 49: 786-793.

Young, T.K. Szathmary, E., Evers, S., Wheatley, B. 1990. Geographical distribution of diabetes among the Native population of Canada: a national survey. Soc. Sc. & Med. vol. 31:129-139.

Young, T.K., McIntyre, L.L., Dooley, J. and Rodriguez, J. 1985. Epidemiologic features of diabetes mellitus among Indians in northwestern Ontario and northeastern Manitoba. Can. Med. Assoc. J. vol. 132 :793-797.

APPENDIX I

RECOMMENDATIONS FOR USING THE QUESTIONNAIRE AND INTERVIEW GUIDE

RECOMMENDATIONS FOR USING THE QUESTIONNAIRE

Given the objectives of the pilot project, we would like to suggest that certain modifications be made in the questionnaire so that they may eventually be used to collect data for a project covering all the Cree communities.

1. In the main questionnaire, combine questions 9, 10, 11, and 12 into a single question or simply drop them, as they add little to the study.
2. Keep question 13 on the perception of body size and question 14 on television.
3. Drop questions 15, 16, and 17 and replace them with the question: "Whether at school or not, how many times a week do you exercise (for at least a half hour) hard enough to sweat or get out of breath?"
4. Keep questions 18 and 19 on sleeping habits, but ask these questions before the one on television.
5. Keep question 20 on smoking.
6. Drop question 21 on self-esteem. It seems to be poorly understood by the school children and shows no significant association with the variables studied.
7. Keep questions 22 and 23 on control over diet and breakfast.
8. Drop questions 24 to 28. They add little and take up a lot of time.
9. Reformulate question 29 on the healthy and nutritious foods we should eat/drink (to avoid confusion with favourite foods).
10. Drop or modify the open questions 30, 31, 32. They are very demanding and capture little information.
11. Keep question 33 on preferences but modify it to obtain clearer answers, e.g. Do you prefer foods from the bush or from the store? Which ones?
12. Keep the 24-hour recall, adding a code number to identify the foods consumed.
13. Keep the questionnaire on frequency of consumption, but drop subquestions b), c), and d) which take up a lot of time and capture little useful information. Drop ice cream (too seasonal).
14. Keep the questions on alcohol consumption (41), as well as the last questions 42, 43, and 44.
15. Keep the measures of height (Francfort position) and weight and calculate the BMI.
16. Take anthropometric measures of all the children in the sample before the food

interview. This procedure seemed more effective and afforded better contact with the school children and teachers.

17. Continue the use of exploratory interviews with groups or key informants. Even if it is long and tedious to transcribe these interviews, they spark discussion among respondents, stimulate reflection about eating habits and obesity, and provide avenues of desirable action.

These recommendations should make it easier to survey the school children, while minimizing the time needed to collect useful data. They should also encourage community involvement in the problem-solving process.

APPENDIX II

QUESTIONNAIRES AND INTERVIEW GUIDE

FOOD HABITS OF CREE SCHOOL CHILDREN
WINTER / SPRING 1992

I.D. #

ANTHROPOMETRY AND PERSONAL DATA

FAMILY NAME-----

FIRST NAME-----

PLEASE CIRCLE THE RIGHT ANSWER

1 COMMUNITY

1. CHISASIBI

2. EASTMAIN

2 SCHOOL GRADE

1. GRADE 4

3. SEC II

2. GRADE 5

4. SEC III

3 LANGUAGE

1. ENGLISH SECTOR

2. SECTEUR FRANCAIS

4 SEX

1. BOY

2. GIRL

5 AGE _____ **YEARS**

6 DATE OF BIRTH

DAY

MONTH

YEAR

7 WEIGHT _____ **KG** **OR** _____ **LBS**

8. HEIGHT _____ **CM** **OR** _____ **IN**

FOOD HABITS

CONSENT OF STUDENT:

Hi! my name is Luce Bernard and I would like to ask you some questions about the food or things you eat and your health in general. This is not an exam, there are no right or wrong answers, and you will not be punished if you do not want to participate in this study. But if you accept, nobody else but me will know your answers, and all the answers put together will be very helpful in understanding the food habits of the Cree children and adolescents. The interview will last about 45 minutes. Do you accept?...

HEALTH

- 9 DO YOU HAVE A HEALTH PROBLEM RIGHT NOW? ☐
1. NO
2. YES
WHICH ONE? _____ ☐
- 10 DO YOU TAKE VITAMINS OR FOOD SUPPLEMENTS? ☐
1. NO
2. YES
WHAT? _____ ☐
WHY? _____ ☐
- 11 DO YOU TAKE ANY OTHER MEDICATION OR PILLS? ☐
1. NO
2. YES
WHY? _____ ☐
- 12 ARE YOU ON A SPECIAL DIET? ☐
1. NO
2. YES
WHAT KIND? _____ ☐
WHY? _____ ☐
- 13 IN DESCRIBING YOURSELF WOULD YOU SAY YOU ARE: ☐
1. TOO THIN
2. JUST ABOUT RIGHT
3. A LITTLE TOO FAT
4. MUCH TOO FAT
5. DNK
9. NO ANSWER

TELEVISION

- 14 ON AVERAGE, HOW MANY HOURS WOULD YOU SAY YOU WATCH TELEVISION
(INCLUDING VIDEO MOVIES AND NITENDO) EVERY WEEK |_|_|_|_|

SCHOOL DAYS?

WEEK ENDS?

TOTAL / WEEK (calculate)

(Interviewer may need to probe: lunch hour, evening,.. use past week as a guide; how many hours yesterday, the day before...is this usual? more/less hours on weekends or holidays? estimate average.)

PHYSICAL ACTIVITY

- 15 HOW OFTEN DO YOU TAKE GYM CLASSES IN SCHOOL? |_|

 TIMES PER WEEK

8. DNK

9. NO ANSWER

- 16 HOW OFTEN DO YOU EXERCISE (FOR AT LEAST HALF AN HOUR) SO THAT
YOU GET OUT OF BREATH AND SWEAT? |_|_|_|_|

 TIMES PER WEEK

08 DNK

09 NO ANSWER

- 17 COMPARED TO OTHERS BOYS (GIRLS) YOUR AGE HOW MUCH PHYSICAL
ACTIVITY OR EXERCISE DO YOU GET? ARE YOU? |_|

1. MUCH MORE ACTIVE

2. MORE ACTIVE

3. ABOUT THE SAME

4. LESS ACTIVE

8. DNK

9. NO ANSWER

HOURS OF SLEEP

- 18 a) AT WHAT TIME DO YOU USUALLY GO TO BED ON SCHOOL DAYS? |_|_|_|_|

b) AT WHAT TIME DO YOU USUALLY GET UP IN THE MORNING ON
SCHOOL DAYS? |_|_|_|_|

c) HOURS OF SLEEP SCHOOL DAYS: (calculate) |_|_|_|_|

- 19 a) AT WHAT TIME DO YOU USUALLY GO TO BED ON WEEKENDS OR
HOLIDAYS? |_|_|_|_|

b) AT WHAT TIME DO YOU USUALLY GET UP IN THE MORNING ON
WEEKENDS OR HOLIDAYS? |_|_|_|_|

c) HOURS OF SLEEP WEEKENDS: (calculate) |_|_|_|_|

CIGARETTE

20 a) AT THE PRESENT TIME DO YOU SMOKE CIGARETTES?

1. NO
2. YES
3. DNK
9. NO ANSWER

b) IF NO HAVE YOU EVER SMOKED?

1. NO
2. YES
3. DNK
9. NO ANSWER

c) IF YES HOW MANY CIGARETTES DO YOU USUALLY SMOKE ?

_____ PER DAY (probe)

_____ PER WEEK (calculate)

SELF ESTEEM

21 I WILL NOW READ SOME STATEMENTS OR SENTENCES AND I WOULD LIKE TO KNOW HOW OFTEN YOU FEEL THAT WAY:

	MOST OF THE TIME	NOT VERY OFTEN	
a) I MAKE FRIENDS EASILY	1	2	
b) I FEEL LEFT OUT	1	2	
c) I FEEL PROUD OF MYSELF	1	2	
d) I WISH I WERE SOMEONE ELSE	1	2	
e) I FEEL GOOD ABOUT THE WAY I LOOK	1	2	
f) I HAVE TROUBLE DECIDING	1	2	

3. DNK
9. NO ANSWER

LOCUS OF CONTROL ON FOOD INTAKE

22 WHO DECIDES MOST OF THE FOODS OR THINGS YOU EAT OR DRINK:

a) AT BREAKFAST

b) AT LUNCH

c) AT SUPPER

d) AT NIGHT

e) BETWEEN MEALS

3. DNK
9. NO ANSWER

23 a) DO YOU EVER SKIP BREAKFAST ON SCHOOL DAYS?

1. NO
2. YES
3. DNK
4. NO ANSWER

b) IF YES HOW OFTEN EVERY WEEK?

- _____ / WEEK
7. OCCASIONNALLY / NOT EVERY WEEK
 8. DNK
 9. NO ANSWER

24 WHERE DO STUDENTS YOUR AGE GET MOST OF THE INFORMATION ON FOOD AND NUTRITION? (PROBE)

25 DO YOU GET ANY INFORMATION ON FOOD OR NUTRITION FROM THE NURSE OR THE CHR?

1. NO (SKIP Q 28 a)
2. YES
3. DNK
4. NO ANSWER

26 DO YOU GET ANY INFORMATION ON FOOD OR NUTRITION FROM YOUR TEACHERS?

1. NO (SKIP Q 28 b)
2. YES
3. DNK
4. NO ANSWER

SOCIAL INFLUENCE

27 PLEASE ANSWER BY MOST OF THE TIME (MT), OR NOT VERY OFTEN (NO)

WHEN I DECIDE WHAT TO EAT

MT NO

a) I LIKE TO EAT THE SAME THINGS
MY PARENTS EAT

1 2

b) I LIKE TO EAT THE SAME THINGS
MY FRIENDS EAT

1 2

28 AGAIN, PLEASE ANSWER THE FOLLOWING SENTENCES BY
MOST OF THE TIME (MT) OR NOT VERY OFTEN (NO)

I TRY TO EAT

MT NO

a. WHAT THE NURSE OR CHR TELLS ME I SHOULD EAT

1 2

b. WHAT MY TEACHERS TELL ME I SHOULD EAT

1 2

KNOWLEDGE/ATTITUDES/PERCEPTIONS

- 29 WHAT KINDS OF FOODS DO YOU BELIEVE ARE THE RIGHT FOODS
TO EAT OR DRINK? (PROBE)
- 30 a) ARE THERE ANY GOOD THINGS THAT CAN HAPPEN IF YOU (OR A
STUDENT YOUR AGE) EAT(s) OR DRINK(s) THE RIGHT FOODS?
1. NO
 2. YES
 8. DNK
 9. NO ANSWER
- b) IF YES WHAT THINGS? (PROBE)
- 31 a) IS IT HARD FOR YOU (OR A STUDENT YOUR AGE) TO EAT/DRINK
THE RIGHT FOODS?
1. NO
 2. YES
 8. DNK
 9. NO ANSWER
- b) IF YES WHY? (PROBE)
- 32 a) HOW IMPORTANT IS IT FOR A STUDENT YOUR AGE TO EAT/DRINK
THE RIGHT FOODS? (read 1,2,3)
1. VERY IMPORTANT
 2. IMPORTANT
 3. NOT VERY IMPORTANT
 8. DNK
 9. NO ANSWER
- b) IF IMPORTANT WHY? (PROBE)
- 33 a) DO YOU SOMETIMES GO TO THE BUSH?
1. NO
 2. YES
 8. DNK
 9. NO ANSWER
- b) IF YES HOW OFTEN? (PROBE)
1. EVERY WEEKEND
 2. AT LEAST ONCE A MONTH
 3. FOR LONG PERIODS OF TIME
 4. OTHER
 8. DNK
 9. NO ANSWER
- c) IF YES, DO YOU FEEL YOU EAT BETTER WHEN YOU ARE IN THE
BUSH OR AT HOME?
1. BUSH
 2. HOME
 8. DNK
 9. NO ANSWER
- d) WHY? (PROBE)

24 HOUR RECALL

I would now like to know everything you ate or drank from the time you got up in the morning yesterday until going to bed last night. I would like you to mention everything whether at home, school, playing (sports) or visiting friends, including snacks and drinks of all kinds. To make it easy we will start with yesterday morning and think throughout your main activities of the day, especially where and when you ate or drank.

[illegible]

FOOD FREQUENCY QUESTIONNAIRE

We have now arrived at the last part of the questionnaire. In this section, I would like to know how often and how much you eat or drink the following things:

34 DO YOU DRINK SOFT DRINKS?

1. NO
2. _____ /WEEK
8. DNK
9. NO ANSWER

HOW MUCH DO YOU USUALLY HAVE AT A TIME?

1. _____
8. DNK
9. NO ANSWER

a) QUANTITY / WEEK _____ (calculate)
(10-12 oz = 1 unit)

_____.____

b) ON WHAT DAYS MOSTLY?

1. SCHOOL DAYS
2. WEEKENDS/
HOLIDAYS
3. ANY DAY
8. DNK
9. NO ANSWER

c) AT WHAT TIME OF THE DAY MOSTLY?

1. MEALTIME
2. BEFORE SUPPER
3. TV / NITENDO
4. OTHER
8. DNK
9. NO ANSWER

d) DO YOU USUALLY BUY IT YOURSELF?

1. NO
2. YES
8. DNK
9. NO ANSWER

35 DO YOU DRINK FRUIT DRINKS?
(TANG/KOOL AID/LEMONADE)

1. NO
2. _____ /WEEK
8. DNK
9. NO ANSWER

HOW MUCH DO YOU USUALLY HAVE AT A TIME?

1. _____
8. DNK
9. NO ANSWER

a) QUANTITY / WEEK _____ (calculate)
(10-12 oz = 1 unit)

_____.____

b) ON WHAT DAYS MOSTLY?

1. SCHOOL DAYS
2. WEEKENDS/
HOLIDAYS
3. ANY DAY
8. DNK
9. NO ANSWER

c) AT WHAT TIME OF THE DAY MOSTLY?

1. MEALTIME
2. BEFORE SUPPER
3. TV / NITENDO
4. OTHER
8. DNK
9. NO ANSWER

d) DO YOU USUALLY BUY IT YOURSELF?

1. NO
2. YES
8. DNK
9. NO ANSWER

36 DO YOU EAT CHIPS/TACOS...?

1. NO

2. _____ /WEEK

8. DNK

9. NO ANSWER

HOW MUCH DO YOU USUALLY HAVE AT A TIME?

1. -----

8. DNK

9. NO ANSWER

a) QUANTITY / WEEK _____ (calculate)
(1 small bag or equiv. = 1 unit)

_____.____

b) ON WHAT DAYS MOSTLY?

1. SCHOOL DAYS

2. WEEKENDS/

HOLIDAYS

3. ANY DAY

8. DNK

9. NO ANSWER

c) AT WHAT TIME OF THE DAY MOSTLY?

1. MEALTIME

2. BEFORE SUPPER

3. TV / NITENDO

4. OTHER

8. DNK

9. NO ANSWER

d) DO YOU USUALLY BUY IT YOURSELF?

1. NO

2. YES

8. DNK

9. NO ANSWER

37 DO YOU EAT FRENCH FRIES?

1. NO

2. _____ /WEEK

8. DNK

9. NO ANSWER

HOW MUCH DO YOU USUALLY HAVE AT A TIME?

1. -----

8. DNK

9. NO ANSWER

a) QUANTITY / WEEK----- (calculate)
(250 ml = 1 unit)

_____.____

b) ON WHAT DAYS MOSTLY?

1. SCHOOL DAYS

2. WEEKENDS/

HOLIDAYS

3. ANY DAY

8. DNK

9. NO ANSWER

c) AT WHAT TIME OF THE DAY MOSTLY?

1. MEALTIME

2. BEFORE SUPPER

3. TV / NITENDO

4. OTHER

8. DNK

9. NO ANSWER

d) DO YOU USUALLY BUY IT YOURSELF?

1. NO

2. YES

8. DNK

9. NO ANSWER

38 DO YOU EAT CHOCOLATE/CANDIES
LOLLIPOPS?

1. NO
2. _____ /WEEK
8. DNK
9. NO ANSWER

HOW MUCH DO YOU USUALLY HAVE AT A TIME?

1. _____
8. DNK
9. NO ANSWER

a) QUANTITY / WEEK _____ (calculate)
(1 chocolate bar or equiv. = 1 unit)

_____.____

b) ON WHAT DAYS MOSTLY?

1. SCHOOL DAYS
2. WEEKENDS/
HOLIDAYS
3. ANY DAY
8. DNK
9. NO ANSWER

c) AT WHAT TIME OF THE DAY MOSTLY?

1. MEALTIME
2. BEFORE SUPPER
3. TV / NITENDO
4. OTHER
8. DNK
9. NO ANSWER

d) DO YOU USUALLY BUY IT YOURSELF?

1. NO
2. YES
8. DNK
9. NO ANSWER

39 DO YOU EAT CAKES/PASTRIES/COOKIES?
(PIES/DONUTS)
(CHK KIND OF COOKIES)

1. NO
2. _____ /WEEK
8. DNK
9. NO ANSWER

HOW MUCH DO YOU USUALLY HAVE AT A TIME?

1. _____
8. DNK
9. NO ANSWER

a) QUANTITY / WEEK _____ (calculate)
(1 piece pastry or equiv. = 1 unit)

_____.____

b) ON WHAT DAYS MOSTLY?

1. SCHOOL DAYS
2. WEEKENDS/
HOLIDAYS
3. ANY DAY
8. DNK
9. NO ANSWER

c) AT WHAT TIME OF THE DAY MOSTLY?

1. MEALTIME
2. BEFORE SUPPER
3. TV / NITENDO
4. OTHER
8. DNK
9. NO ANSWER

d) DO YOU USUALLY BUY IT YOURSELF?

1. NO
2. YES
8. DNK
9. NO ANSWER

- 40 DO YOU EAT ICE CREAM /I.C. SANDWICH? 1. NO
 2. _____ /WEEK
 3. DNK
 9. NO ANSWER

- HOW MUCH DO YOU USUALLY HAVE AT A TIME? 1. -----
 8. DNK
 9. NO ANSWER

- a) QUANTITY / WEEK _____ (calculate)
 (125 ml or 1 scoop = 1 unit)

- b) ON WHAT DAYS MOSTLY? 1. SCHOOL DAYS
 2. WEEKENDS/
 HOLIDAYS
 3. ANY DAY
 8. DNK
 9. NO ANSWER

- c) AT WHAT TIME OF THE DAY MOSTLY? 1. MEALTIME
 2. BEFORE SUPPER
 3. WATCHING TV
 4. OTHER
 8. DNK
 9. NO ANSWER

- d) DO YOU USUALLY BUY IT YOURSELF? 1. NO
 2. YES
 8. DNK
 9. NO ANSWER

ALCOHOL

- 41 a) HAVE YOU EVER TAKEN A DRINK OF ALCOHOL
 (beer, wine or liquor)?
 1. NO (if no, end of interview)
 2. YES
 8. DNK
 9. NO ANSWER

- b) IF YES IN THE PAST MONTH HAVE YOU TAKEN A DRINK OF
 ALCOHOL?

1. NO (if no, end of interview)
 2. YES
 8. DNK
 9. NO ANSWER

IF YES HOW OFTEN? _____

IF YES HOW MANY DRINKS DO YOU USUALLY HAVE AT ONE TIME?

- _____ DRINKS
 8. DNK
 9. NO ANSWER

- c) TOTAL _____ /PAST MONTH (calculate number of drinks)
 8. DNK
 9. NO ANSWER

(one drink means: 1 bottle of beer or 4
 oz of wine or 1 shot (1 1/2) oz of liquor)

42 INTERVIEWER'S SUBJECTIVE ASSESSMENT OF MORPHOLOGY

1. TOO THIN
2. JUST ABOUT RIGHT (WELL PROPORTIONED)
3. A LITTLE TOO FAT
4. MUCH TOO FAT
8. DNK
9. NO ANSWER

43 WEEK DAY COVERED BY THE 24 HOUR PERIOD

1. SUNDAY
2. MONDAY
3. TUESDAY
4. WEDNESDAY
5. THURSDAY
6. HOLIDAY
9. NO ANSWER

44 ABILITY OF THE STUDENT TO ANSWER THE QUESTIONS

- 1) VERY GOOD
- 2) GOOD
- 3) FAIR
- 4) POOR

WEEK DAY OF THE INTERVIEW _____

DATE _____

FOCUS GROUP

Good afternoon/evening!

My name is Luce Bernard. I am a research assistant hired by the Northern Quebec Module (DSC Montreal General) to do a study of food habits of Cree school children. I am happy to be here this afternoon/evening and I do thank you for having accepted to participate in this group discussion on **Food habits of school children**. The information gathered will be helpful in building food and nutrition programs adapted to the Cree children.

Health practitioners agree that chronic diseases in adults are related, among other things, to the food patterns developed in childhood and adolescence. Today/tonight, I would like to have your views on what makes children and adolescents eat the way they do, and how important these different factors are in affecting the eating habits of children and adolescents.

The rules of the game are simple:

- I would like to have your personal opinions or views on the subject.
- The discussion group will last a maximum of two hours and I have prepared some questions to facilitate the discussion. I am here not to talk, but to listen to you.
- Before we start, I will first ask you to fill up these small cards to obtain information on your age-group, and your field of work. Your name is only for my own information this afternoon/evening.
- The information given will remain confidential and your name will not appear anywhere in connection with this study. All personal points of view expressed in this group will not be associated with a person, but rather with the discussion group.
- With your permission, I will tape the discussion to make sure I get all points of view or opinions expressed.

Any questions before we start?

FOCUS GROUP QUESTIONS

1. How would you describe good eating habits / bad eating habits of school children (6-11 years)?
adolescents (12-18 years)?
- 2) What are the advantages of good eating habits for school children? and adolescents?
- 3) What in the environment here are are barriers or obstacles to good eating habits among school children and adolescent. In other words, what prevents them from eating well? or What makes it difficult for them to eat well?
- What in the environment here makes it easy for school children and adolescents to develop good eating habits?
Is it possible for school children and adolescents to eat well?
- 4) Who in the total community has influence on the children's and adolescents' food habits? How? Can you be more specific?...
- 5) Of all the things mentioned, which affect the eating habits of school children and adolescents, which factors would you say are the most important?
- 6) Among those factors, which ones could possibly be acted upon in a nutrition intervention activity or project?
- 7) What could be done? Any suggestions?

APPENDIX III

FOODS CONSUMED (24H. RECALL)

**DIETARY VARIETY 24H
(PRESENCE/ABSENCE OF FOODS)
BY COMMUNITY, IN %**

	TOTAL N=144 %	CHISASIBI N=104 %	EASTMAIN N=40 %
<u>CAKES/SWEETS/JUNK FOOD</u> (mentioned 457 times)			
White/Brown sugar	57.6	51.4	72.5
Soft drinks reg.	49.3	53.8	37.5
Soft drinks diet	0.7	1.0	-
Kool Aid	27.1	21.2	42.5
Tang	25.0	27.9	17.5
Chips	40.3	39.4	42.5
Sweet chewing gum	30.6	37.5	12.5
Sugarless chewing gum	10.4	11.5	7.5
Cakes	22.9	22.1	25.0
Pies	4.9	4.8	5.0
Donuts	0.7	1.0	-
Store bought cookies	20.1	19.2	22.5
Home-made cookies	3.5	3.6	2.5
Store-bought tea biscuits	2.1	1.0	5.0
Chocolate bar	9.0	10.6	5.0
Jam	5.6	5.8	5.0
Aunt Jemima syrup	2.8	3.6	-
Jello	2.8	1.9	5.0
Sweet Popcorn	1.4	1.9	-
Fudgicle	0.7	-	2.5

	TOTAL N=144 %	CHISASIBI N=104 %	EASTMAIN N=40 %
<u>BREAD/CEREALS</u> (A + B + C = 262 mentions) (See also pasta)			
A) BREAD/HOT CEREALS (152 mentions)			
White bread	74.3	73.1	77.5
Bannock	9.7	10.6	7.5
Dumplings	4.2	5.8	-
White home made bread	2.8	2.9	2.5
Oatmeal	8.3	8.7	7.5
Whole wheat bread	5.6	6.7	2.5
Cream of wheat	0.7	1.0	-
B) READY TO EAT CEREALS (46 mentions)			
Corn Flakes	8.3	8.7	7.5
Rice Krispies	4.9	4.8	5.0
Special K	4.2	5.8	-
Frosted Flakes	3.5	3.8	2.5
Honey Combs	3.5	4.8	-
Corn Pops	2.1	2.9	-
Fruit Loops	2.1	1.9	2.5
Cheerios	1.4	1.9	-
Crispix	0.7	1.0	-
Pacman	0.7	1.0	-
Turtles	0.7	1.0	-
C) OTHERS (64 mentions)			
Soda biscuits\Ritz	13.9	13.5	15.0
Boiled Minute Rice	9.0	9.7	10.0
Fried Rice/Wild rice	2.1	1.0	5.0
Regular boiled rice	0.7	-	2.5
Rice/noodle soup	9.0	9.6	7.5
Popcorn without sugar	3.5	2.9	5.0
Pancakes/Waffles	2.8	3.8	-
Cree pancakes	1.4	1.9	-
Home-made muffins	0.7	1.0	2.5
Macaroni salad	0.7	1.0	-

	TOTAL N=144 %	CHISASIBI N=104 %	EASTMAIN N=40 %
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<u>MILK AND MILK PRODUCTS</u> (219 mentions)			
Grand Pré milk	75.7	78.8	67.5
Carnation milk	36.1	36.1	35.0
Dallaire 2% milk	9.7	12.5	2.5
3.25% milk	4.2	5.8	-
Ice cream	11.8	11.3	-
Cheese	11.1	11.5	10.0
Hot chocolate	2.1	-	7.5
Milk Shake	0.7	1.0	-
Yogourt	0.7	1.0	-
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	TOTAL N=144 %	CHISASIBI N=104 %	EASTMAIN N=40 %
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FRUITS / FRUIT JUICE (134 mentions)

Orange juice	28.5	35.6	10.0
Apple juice	22.2	26.9	10.0
Apple	20.8	22.1	17.5
Orange	8.3	8.7	7.5
Banana	6.3	5.8	7.5
Blueberries	1.4	1.9	-
Grapefruit	0.7	1.0	-
Home-made fruit salad	0.7	1.0	-
Raisins	0.7	1.0	-
Canned peaches	2.1	1.9	2.5
Canned fruit salad	0.7	1.0	-

VEGETABLES (125 mentions) (Vegetables also in mixed dishes)

French fries	29.2	30.8	25.0
Instant mashed potatoes	11.1	8.7	17.7
Boiled potatoes	10.4	7.7	17.7
Home mashed potatoes	7.6	9.6	2.5
Baked potatoes	0.7	1.0	-
Fresh carrots	4.2	3.8	5.0
Fresh vegetable salad	0.7	1.0	-
Broccoli	0.7	1.0	-
Vegetable soup	4.9	5.8	2.5
Fried onions	4.2	-	15.0
Canned peas	6.9	4.8	12.5
Canned corn	3.5	2.9	5.0
Canned peas and carrots	2.8	3.8	-

	TOTAL N=144 %	CHISASIBI N=104 %	EASTMAIN N=40 %
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MIXED DISHES (A + B + C = 160 mentions)			
A) SANDWICH (58 mentions)			
Hot Dog	11.8	12.5	10.0
Hamburger/Cheeseburger	9.7	13.5	-
Poutine	5.6	4.8	7.5
Ham sandwich	2.8	3.8	-
Grilled Cheese	2.1	2.9	-
French toast	2.1	1.9	2.5
Egg sandwich	2.1	2.9	-
Bologna sandwich	1.4	1.0	2.5
Cheese sandwich	1.4	1.9	-
Hot chicken sandwich	0.7	-	2.5
Salmon sandwich	0.7	-	2.5
B) PASTA (54 mentionss)			
Kraft Dinner	16.0	12.5	25.0
Tomato macaroni/spaghetti	8.3	7.7	10.0
Meat macaroni/spaghetti	11.1	9.6	15.0
Lasagna	2.1	1.9	2.5
C) OTHER DISHES (48 mentions)			
Pizza	7.6	9.6	2.5
Caribou stew	6.3	8.7	-
Corn Beef Hash	5.6	3.8	10.0
Canned beef stew	4.9	4.8	5.0
Moose stew	4.2	4.8	2.5
Shepherd's pie	2.8	2.9	2.5
Swanson beef pie	0.7	1.0	-
Ptarmigan stew	0.7	1.0	-
Home-made meat/vegetable rice	0.7	1.0	-

	TOTAL N=144 %	CHISASIBI N=104 %	EASTMAIN N=40 %
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MEAT FISH POULTRY (A + B = 98 mentions) (See also mixed dishes)

B=BOILED, R=ROASTED, F=FRIED, DF=DEEP FRIED, G=GRILLED, C=CANNED

A) MEAT / POULTRY (90 mentions)

Pork chops F	11.8	9.6	17.5
Pork chops G	1.4	1.9	-
BBQ ribs	1.4	1.0	2.5
Chicken R	11.1	11.5	10.0
Chicken DF	2.8	1.9	5.0
Chicken B	2.1	1.9	2.5
Steak F	8.3	5.8	15.0
Ground beef F	1.4	1.0	2.5
Soya beef	0.7	-	2.5
Klik C	4.9	1.9	12.5
Moose B	3.5	1.9	7.5
Moose F	0.7	-	2.5
Hot dog sausage C	3.5	1.9	7.5
Goose R	2.8	3.8	-
Goose B	0.7	1.0	-
Beaver B	1.4	1.9	-
Beaver R	0.7	-	2.5
Rabbit	1.4	1.9	-
Partridge B	0.7	-	2.5
Ptarmigan B	0.7	1.0	-
Deer	0.7	-	2.5

B) FISH (8 mentions)

Trout F	2.1	2.9	-
Pike F	0.7	-	2.5
Char F	0.7	1.0	-
White fish F	0.7	1.0	-
Fish G	0.7	1.0	-
Fish & chips DF	0.7	1.0	-

	TOTAL N=144 %	CHISASIBI N=104 %	EASTMAIN N=40 %
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<u>LEGUMES NUTS AND EGGS</u> (81 mentions)			
Fried eggs	18.8	15.4	27.5
Boiled eggs	13.2	13.5	12.5
Omelet	0.7	1.0	-
Peanut butter	17.4	21.2	7.5
Baked beans	1.4	1.0	2.5
Canned pea soup	2.1	2.9	-
Sunflower seeds	0.7	1.0	-
 <u>FATS</u>			
Butter	52.1	51.9	52.5
Margarine	31.9	32.7	30.0
Bacon	6.9	5.8	10.0
 <u>TEA\COFFEE</u>			
Tea	67.4	67.3	67.5
Coffee	4.9	1.0	15.0
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	TOTAL N=144 %	CHISASIBI N=104 %	EASTMAIN N=40 %
GAME AND FISH INCLUDED IN MIXED DISHES OR MEAT/SUBSTITUTES CATEGORIES			
Moose stew	4.2	4.8	2.5
Moose B	3.5	1.9	7.5
Moose F	0.7	-	2.5
Caribou stew	6.3	8.7	-
Goose R	2.8	3.8	-
Goose B	0.7	1.0	-
Beaver B	1.4	1.9	-
Beaver R	0.7	-	2.5
Rabbit	1.4	1.9	-
Ptarmigan stew	0.7	1.0	-
Ptarmigan B	0.7	1.0	-
Partridge B	0.7	-	2.5
Deer	0.7	-	2.5
Pike F	0.7	-	2.5
Char F	0.7	1.0	-
White fish F	0.7	1.0	-
Fish G	0.7	1.0	-
Trout F	2.1	2.9	-

APPENDIX IV

EATING PREFERENCES

GROUPED MULTIPLE SPONTANEOUS RESPONSES TO THE QUESTION ON FOOD PREFERENCES, BY COMMUNITY

	TOTAL N=144 %	CHISASIBI N=104 %	EASTMAIN N=40 %
<u>GENERAL</u>			
Bush food/Cree food	21.5	18.3	30.0
Store-bought food	11.1	12.5	7.5
Bush or store-bought food	9.7	7.7	15.0
Bush food/confort of the home	4.2	1.9	10.0
<u>FOOD</u>			
Goose	58.3	55.8	65.0
Caribout	25.0	33.7	2.5
Moose	25.0	20.2	37.5
Beaver	23.6	22.1	27.5
Rabbit	21.5	15.4	37.5
Duck	18.1	14.4	27.5
Fish	15.3	14.4	17.5
Bear	13.2	15.4	7.5
Ptarmigan	7.6	6.7	10.0
Partridge	6.9	6.7	7.5
Spaghetti/Macaroni	6.3	8.7	-
Steak/Stew/Store boght meat	4.9	4.8	5.0
Vegetables/Potatoes	3.5	3.8	2.5
Fruits/Juices	3.5	4.8	-
Milk	2.8	2.9	2.5
Shepherd's pie	2.8	3.8	-
Chips/Fench fries/Poutine	2.8	3.8	-
Pizza	2.1	2.9	2.5
Bannock/Dumpling	2.1	1.9	2.5
Deer/Porcupine	1.4	1.9	-
Soup	1.4	1.9	-
Berries	1.4	1.9	-
Soft drinks	1.4	1.9	-
Cereals	0.7	1.0	-
Toast	0.7	1.0	-
Eggs	0.7	1.0	-
Fresh water	0.7	1.0	-
Tea	0.7	1.0	-
<u>OTHERS</u>	4.2	4.8	2.5

APPENDIX V

FOOD THAT WE SHOULD EAT OR DRINK

**FOOD THAT WE SHOULD EAT OR DRINK
WHOLE POPULATION, IN %**

Multiple spontaneous responses, n = 144

	N	%
<u>FRUITS/ FRUIT JUICES = 164</u>		
Juice	34	23,6
Fruits	30	20,8
Apple	32	22,2
Orange	27	18,8
Banana	16	11,1
Apple juice	7	4,9
Orange juice	5	3,5
Pinapple	3	2,1
Pear	2	1,4
Grapes	2	1,4
Kiwi	1	0,7
Melon	1	0,7
Fruit salad	1	0,7
Raspberries	1	0,7
Grapefruit	1	0,7
Berries	1	0,7

Various fruits = 100 / 144 = 69,4%

MEAT AND SUBSTITUTES = 114

Meat substitutes	32	22,2
Game	63	43,8
Fish	11	7,6
Steak	4	2,8
Chicken	2	1,4
Ground beef	1	0,7
Dry beans	1	0,7

	N	%
<u>MILK / MILK PRODUCTS = 92</u>		
Milk products	1	0,7
Milk	75	52,1
Cheese	14	9,7
Chocolate milk	1	0,7
Yogourt	1	0,7
<u>VEGETABLES = 68</u>		
Vegetables	35	24,3
Carrots	12	8,3
Potatoes	5	3,5
Vegetable juice	3	2,1
Salad	3	2,1
Soup	3	2,1
Lettuce	2	1,4
Tomato	2	1,4
Peas	1	0,7
Celery	1	0,7
Broccoli	1	0,7
<u>CEREALS = 28</u>		
Cereals	15	10,4
Bread	6	4,2
Rice	3	2,1
Toast	2	1,4
Oatmeal	1	0,7
Bannock	1	0,7

	N	%
<u>MIXED DISHES = 13</u>		
Spaghetti	6	4,2
Kraft dinner/other	4	2,8
Shepherd's pie	2	1,4
Lasagna	1	0,7
<u>"FAST FOODS" = 5</u>		
Hamburger	1	0,7
Hot Dog	1	0,7
French fries	1	0,7
Pizza	1	0,7
Poutine	1	0,7
<u>OTHERS = 49</u>		
Water	20	13,9
Tea	14	9,7
Others	15	10,4
<u>DO NOT KNOW</u>		
	8	5,6
<u>GAME = 63</u>		
(included in meat and substitutes)		
Goose	22	15,3
Caribou	11	7,6
Moose	9	6,3
Beaver	7	4,9
Bear	6	4,2
Rabbit	3	2,1
Ptarmigan	3	2,1
Partridge	2	1,4

APPENDIX VI

SOURCES OF INFORMATION ON NUTRITION

**SOURCES OF INFORMATION ON NUTRITION,
BY FREQUENCY OF MENTION**

	N
Mother	53
Nurse	19
Father	18
Do not know	13
Grandmother	8
Sister	6
Doctor	4
Biology book	4
Community health representative	3
Brother	3
Friend	3
Magazine	3
Others	3
Grandfather	2
Grandparents	2
Nutritionist	1
Dental hygienist	1
Uncle	1