A B S T R A C T

A complex set of social, economic, cultural and environmental circumstances affecting native Canadians in northern regions has resulted in the dietary replacement of indigenous foods with marketed products not always of equivalent nutritional value. This article examines the current food supply in three northern Manitoba Cree communities by looking at the availability and preservation of traditional foods, the price of marketed foods and perceptions of the food supply. Data were obtained by questionnaire from older adults (over 55 years) and younger women (16-45 years) in each community. The food supply comprised a mix of traditional and marketed foods, with limited use of traditional methods of food preservation. Marketed food prices were high in communities without all-weather road access. Respondents expressed a desire for more traditional food. Promotion of traditional foods could increase nutrient intake, decrease food costs and contribute to a revival of interest in Cree culture.

A B R É G É

Un ensemble complexe de conditions sociales, économiques, culturelles et environnementales influençant les autochtones des régions du Nord du Canada a abouti au remplacement des aliments autochtones traditionnels par des produits commerciaux qui n'ont pas toujours la même valeur nutritive. Cet article étudie l'approvisionnement alimentaire actuel dans trois communautés Cree du Manitoba en examinant la disponibilité et la préservation des aliments traditionnels, le prix des aliments commerciaux et comment ces aliments sont perçus par la population. Les données ont été recueillies à l'aide d'un questionnaire envoyé aux adultes plus âgés (plus de 55 ans) et aux femmes plus jeunes (16 à 45 ans) dans chaque communauté. Les aliments disponibles comprenaient un ensemble d'aliments traditionnels et commerciaux, avec un recours limité aux méthodes traditionnelles de préservation des aliments. Les prix des aliments commerciaux étaient élevés dans les communautés ne disposant pas d'une route d'accès ouverte en tout temps. Les répondants ont dit qu'ils souhaiteraient disposer d'une plus grande quantité d'aliments traditionnels. La promotion des aliments traditionnels pourrait permettre d'augmenter l'apport nutritif, de diminuer le coût de l'alimentation et de contribuer à un regain d'intérêt pour la culture Cree.

The Contemporary Food Supply of Three Northern Manitoba Cree Communities

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The food system traditional to the northern Cree emphasized plant and animal foods available in the immediate area and thus was influenced primarily by the ecology of the region. However, the use of locally available traditional foods has declined over the years and been replaced with marketed products, not always of equivalent nutritional value.¹

Studies of the diet of aboriginal peoples have tended to focus on intake; less attention has been given to understanding the food supply, perceptions of the food supply and how these affect food security. Understanding the community food supply is a necessary prerequisite for the design of nutrition interventions. This paper describes what was learned about the contemporary food supply in three northern Manitoba Cree communities during a survey of dietary intake.^{2,3} It considers the availability and preservation of traditional foods (such as wild game, birds, fish, berries and plants), access to grocery stores, the price of marketed foods, and perceptions of changes in the food supply.

METHODS

Communities and respondents

Three communities were studied — Nelson House (NH), South Indian Lake (SIL) and God's River (GR) — because of

concerns about the impact that hydroelectric development had on the food supply. The Churchill River Diversion (CRD), completed in 1977, flooded approximately 528,000 acres of land in northern Manitoba.⁴ Mercury levels rose in predatory fish (northern pike, walleye, lake trout) in lakes along the diversion route, which led the federal government to recommend decreased consumption of fish with the highest mercury content.⁵ Trapping and hunting also were affected as migration trails were disrupted, traplines flooded and shorelines for nesting waterfowl destroyed.⁶ Residents of NH and SIL showed the highest blood mercury levels of communities along the diversion route, and residents of GR, who were not affected by the CRD, exhibited high blood mercury of unknown origin.²

The communities and the study methodology have been described previously.^{2,3,7} In brief, information about the food supply was obtained from women of childbearing age (16-45 years) and older men and women (over 55 years). These groups were studied because of concerns about mercury risk to the fetus and possible higher mercury intakes by older adults with their greater consumption of traditional foods.

Respondents were selected, at random, from a sampling frame constructed from updated band and community lists. The number of respondents selected from each community was initially determined in proportion to its relative size. Because the number of older adults in GR was small, the total population was included.

Instruments

A questionnaire about the food supply was administered by trained local Cree

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interviewers. Questions were developed for the study or adapted from other research.⁸⁻¹⁰ Since data for the larger study were collected in two seasons, some questions were asked in the fall and others in the winter.

The price of 43 marketed foods in the Agriculture Canada Thrifty Nutritious Food Basket¹¹ and 14 additional foods common to the communities (e.g., evaporated milk, canned luncheon meat) was obtained for the fall and winter in stores used by the communities. Winnipeg prices were obtained from Statistics Canada.

All methods were pretested in each community using a random sample of respondents. Before the study the chiefs, mayor and councils in the communities were consulted and their approval and cooperation obtained.

Analysis

The data reported here are the responses from those subjects who were selected at random and from whom responses were obtained. At the time the questionnaire was administered, difficulties were encountered in locating a substantial number of selected individuals, particularly younger women (16-45 years) in NH and SIL, because they attended school outside the community.^{2,3} This sampling problem makes it difficult to define precisely the population from which the samples were obtained, making inference to such ill-defined populations risky. As a result, the reporting, analysis, and tables are provided on a respondent basis only. Similarly, comparisons across communities are observational and refer to the respondents' answers; statistical comparisons across communities were not attempted as the absentee problem might have meant that the populations to be compared were not equivalent.

RESULTS

Response rate

Participation in the study was high. Of those contacted in the fall, 95% in NH and GR participated and 87% in SIL. Most of those who participated in the fall also participated in the winter (90%, 91%, and 92% in SIL, NH and GR, respectively).

TABLE I
Presence of a Trapper, Hunter or Fisherman in the Household

Harvester Category	God's River (n=66) %	Nelson House (n=252) %	South Indian Lake (n=132) %
Trapper	29	40	58
Hunter	49	48	66
Fisherman	82	34	33

TABLE II
Preservation of Traditional Country Foods in Each Community

	God's River (n=56) %	Nelson House (n=205) %	South Indian Lake (n=102) %
Number Preserving (%)	43 (77)	108 (53)	69 (68)
Foods Preserved			
Moose	100 *	84	91
Caribou	74	13	13
Whitefish	54	88	86
Walleye	37	44	67
Northern pike	65	30	75
Lake trout	65	4	30
Redsucker	0	1	51
Raspberries	2	36	74
Blueberries	2	50	59
Strawberries	2	11	23
Mossberries	2	48	75

* % of number preserving

Respondent characteristics

A detailed description of the respondents has already been reported.^{2,3,7} In brief, the mean age of the respondents was similar in all communities for older adults (65-72 years) and younger women (23-30 years). The majority of respondents (84-99%) in all communities had less than 12 years of formal education. The majority in all communities (51-69%) had not been employed in the previous 12 months; however, most (60-85%) had at least one other person in the household who was employed, usually the spouse (47-62%).

Traditional foods

Presence of harvesters in household

Traditional harvesting activities were explored by questions asking whether there was an active hunter, trapper, or fisherman in the household. Of the 450 respondents, 53% had an active hunter in the household, 44% a trapper, and 41% a fisherman (Table I). The percentage with a fisherman was particularly high in GR, while SIL had a high percentage of households with trappers and hunters.

Preservation

Most respondents (61%) preserved traditional foods, with a trend to higher rates in GR and SIL than NH (Table II). Moose and whitefish were the most frequently preserved wild game and fish (90% and 81% of those preserving). Caribou and lake trout were preserved particularly in GR, redsucker in SIL, and berries in NH and SIL.

Freezing was the most common method of preservation used by respondents in all communities. The majority of respondents in all communities (63%) had a chest freezer. Freezing was used by all who preserved fish and wild game and by over 90% of those preserving berries. In SIL smoking was also used for moose (24% of those preserving moose) and fish (22% of those preserving redsucker and 11% to 15% of those preserving other fish). Berries were canned or made into jam/jelly by 30 to 50% and 50 to 60% of those preserving berries in NH and SIL.

Desire for more traditional foods

To determine whether more traditional foods would be eaten if they were available, respondents were asked "Would you eat more fish [wild meat and birds] if it was available in this house?" and "What kinds

TABLE III
Desire for More Fish and Wild Meat and Birds in Each Community

	God's River (n=65)	Nelson House (n=251)	South Indian Lake (n=130)
Number Desiring More Meat and Birds (%)	52 (80)	235 (94)	122 (94)
Desired Types			
Caribou	25 *	46	46
Moose	94	96	98
Beaver	10	42	28
Muskrat	4	26	22
Rabbit	14	81	50
Duck	81	87	67
Goose	54	71	82
Loon	12	6	10
Partridge	14	31	35
Number Desiring More Fish (%)	44 (68)	203 (81)	99 (76)
Desired Types			
Whitefish	46 *	92	65
Walleye	36	66	39
Northern pike	84	60	76
Redsucker	2	13	42
Lake trout	57	11	14
Brook trout	9	2	6

* % of number desiring more

TABLE IV
Price of 22 Foods in Northern Stores and in Winnipeg

Store	September \$	%*	January \$	%*	Jan.-Sept. % Change
Winnipeg	45.96		47.12		2.5
TH Shopeasy	41.05	-10.7	44.64	-5.3	8.7
TH Safeway	45.30	- 1.4	47.01	-0.2	3.8
NH Northern Store	64.58	40.5	68.18	44.7	5.6
SIL Community Store	71.68	56.0	79.72	69.2	11.2
LR Co-op	57.44	25.0	55.02	16.8	-4.2
GR Band Store	85.86	86.8	90.27	91.6	5.1

TH=Thompson; NH=Nelson House; SIL=South Indian Lake; LR=Leaf Rapids; GR=God's River
* % difference from Winnipeg

would you prefer?" The majority of respondents indicated they would eat more fish (78%) and wild meat and birds (92%) (Table III), especially more moose (97%), ducks (80%), geese (72%), whitefish (78%) and northern pike (68%). More caribou was desired specifically in NH and SIL, more rabbit, whitefish and walleye in NH, more lake trout in GR and redsucker in SIL.

Marketed foods

Access to stores

Almost all respondents in GR (95%) relied on the community store in all seasons

because GR is a fly-in community, with the nearest store 502 km away by boat or winter road. By contrast, SIL and NH respondents used several stores. In all seasons, the majority of NH respondents (about 80%) shopped in Thompson, as Thompson is accessible year-round by road, 75 km away. SIL residents can access Thompson and Leaf Rapids in winter and summer but not during fall freeze-up and spring break-up of the lake on which it is situated. Thus a higher percentage of SIL respondents reported shopping at the community store in fall and spring than in winter and summer (61% and 68% versus 51% and 49% respectively).

Food prices

The price of 22 foods was available in all stores in fall and winter (Table IV). The difference between Winnipeg prices and northern prices was greater in communities without all-weather road access (GR, SIL) than in those with road access (LR, NH).

The change in prices from fall to winter in NH and GR was two times higher than that in Winnipeg and five times higher in SIL. Leaf Rapids prices were lower in winter than fall for unknown reasons.

Change in the use of traditional and marketed foods

The effect that hydroelectric development had on the food supply in NH and SIL was explored by asking those over 30 years of age in NH and SIL "Have you changed the foods you eat since the flooding of the lakes around here?" Age was used to select respondents to ensure they could recall events around the time of the flood. The mean age of respondents was similar to the mean number of years lived in the community, thus indicating stability of residence and familiarity with the effects of the flood.

Forty-five percent of the 125 persons who answered this question in NH, and 62% of the 65 in SIL, indicated they had changed their food habits. Of these, 68% indicated they ate less of all types of fish, about 60% ate less wild meat, and 46% and 90% in NH and SIL respectively ate more store foods.

Of those who changed, 61% in NH and 83% in SIL said the main reason they changed food was that fewer fish were available, while 68% in NH and 80% in SIL indicated that less wild meat was available. Mercury in fish was mentioned by 32% of those who changed in NH and 20% in SIL.

DISCUSSION

Hunting, trapping and fishing are still important activities in the study communities, consistent with the view that traditional practices have survived and are resilient to change.¹²⁻¹⁴ Nevertheless, close to 50% of respondents in all three communities did not have an active hunter, trapper or fisherman in the household, thus

limiting the availability of traditional foods. Respondents clearly expressed a desire for more traditional foods, a finding similar to that of other studies showing that traditional foods are still well-liked and preferred over marketed foods.¹⁵

Traditional foods continue to be preserved in the study communities, which extends their use throughout the year. However, traditional methods of preservation have given way to modern methods. Traditionally, fish and wild game were smoked, whereas berries and some plants were air-dried.¹⁶ Today, freezing, canning and jam/jelly-making are common. The traditional method of smoking wild game and fish is still practised, although mainly by older adults in SIL. Lack of published data on preservation in other aboriginal communities limits comparisons.

Many factors influence the availability of traditional foods and their preservation in the contemporary diet. These include the availability of species (e.g., lake trout and caribou only in GR), food safety issues (e.g., mercury in fish in NH and SIL), time and energy required (e.g., to gather berries and to preserve; to travel greater distances to obtain fish from unflooded lakes), costs (e.g., home freezers; airline costs to more distant unflooded lakes), knowledge of traditional harvesting and preservation techniques, and interest in pursuing traditional ways.

The CRD was perceived by many of the respondents in NH and SIL to have changed their food habits. However, it is impossible to disentangle the effects of the CRD from other changes that occurred concurrently. Thus, the CRD can be considered one of many factors that have led to the dietary replacement of indigenous foods with marketed products in these communities.

Decreased use of traditional foods is a concern. These foods are rich in nutrients found in short supply in the diet of those studied.³ In addition, market substitutes are expensive, as has been found in other northern communities.¹⁷⁻²⁰ High prices

coupled with limited purchasing ability suggest that many people in these communities would find the high price of food a financial burden and a threat to food security.

CONCLUSION

The contemporary food supply in the three study communities included a mix of traditional and marketed foods. The price of marketed foods, especially in communities without all-weather road access, was particularly high. Hydroelectric development is one factor that has disrupted the supply of foods from the land. Since the respondents in this study want more traditional foods, it is timely and important for the communities to promote their use to the greatest extent possible, given available supplies and the cost of harvesting. Increased attention to these foods could increase nutrient intake, decrease food costs and contribute to a revival of interest in Cree culture.

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