

TRADITIONAL AND MARKET FOOD ACCESS IN ARCTIC CANADA IS AFFECTED BY ECONOMIC FACTORS

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ABSTRACT

Objectives. This study aimed to evaluate the access that Indigenous women have to traditional and market foods in 44 communities across Arctic Canada.

Study design. This secondary data analysis used a cross-sectional survey of 1771 Yukon First Nations, Dene/Métis and Inuit women stratified by age.

Methods. Socio-cultural questionnaires were used to investigate food access and chi-square testing was used to ascertain the distribution of subject responses by age and region.

Results. There was considerable regional variation in the ability to afford adequate food, with between 40% and 70% saying they could afford enough food. Similarly, regional variation was reflected in the percentage of the population who could afford, or had access to, hunting or fishing equipment. Up to 50% of the responses indicated inadequate access to fishing and hunting equipment, and up to 46% of participants said they could not afford to go hunting or fishing.

Conclusions. Affordability of market food and accessibility to hunting and fishing in Arctic Canada were major barriers to Indigenous women's food security.

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Keywords: food security, Arctic, traditional food, market food, indigenous

INTRODUCTION

Canadian Indigenous Peoples, and women in particular, are at increased risk of food insecurity (FI) (1p. 47-51., 2, 3). People are considered food insecure when they do not always have “physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (2).

Previous studies have demonstrated that FI can have negative health consequences (4-6). According to many measures of overall health, Indigenous Peoples have been reported to have consistently poorer health than other Canadians (7). It has been pointed out that many of the current health problems can be explained by the transitioning food system (8, 9). Diets that once consisted solely of traditional food now include market foods that are typically higher in saturated fats and sugar (9, 10). Currently, the average diet is a major contributing factor to the high incidence of overweight and obesity among Canadian Indigenous Peoples (7, 11). While it may seem to be counter-intuitive, poverty-induced FI may be playing a role in the obesity problem (12). Although studies examining the relationship between FI and being overweight continue to produce conflicting results (13, 14), Drewnowski and Spector report that “the association between poverty and obesity may be mediated, in part, by the low cost of energy-dense foods, and may be reinforced by the high palatability of sugar and fat” (15).

Canadians who are food insecure are more likely to feel unhealthy (6), be prone to infection, and have chronic health problems (16). All these conditions have been documented

as being increasingly evident in Indigenous communities (7, 17, 18). Food insecurity is also a predictor of nutrition status among adults (19). The data clearly show that many Arctic Indigenous Peoples have intakes of certain nutrients below the recommended levels (11, 20-23).

In addition to its impact on physical health, FI can impose psychological and social challenges. A Canadian study of low-income households uncovered some of the characteristics of FI, such as preoccupation with food access, feelings of lack of control, and psychological struggles (4). Problems such as social exclusion, distress, reduced ability to learn, and depression have also been documented (5, 24-26). Consequences of FI can extend beyond the individual, reducing harmony in families and communities because of feelings of anger, revolt and hopelessness (5).

Indigenous Canadians, particularly in remote communities, experience FI due to under-employment, unemployment, low incomes and high living costs (2, 7, 18, 22, 27). When compared to southern communities, people in the Arctic pay much more for groceries (18, 20) that are often inferior in quality, variety and nutritional value (18, 28, 29).

Although traditional food use is declining, it remains an important contributor of nutrients and cultural benefits (10, 11, 27, 30). For those who are unable to supplement their diets with traditional food due to lack of hunting and/or fishing equipment, the challenge of accessing an appropriate diet intensifies (18).

National food security studies, such as The National Population Health Survey and

The Canadian Community Health Survey, do not specifically enquire about access to traditional food (3, 16, 31) and, at the very least, it is questionable whether these surveys are helpful in understanding the role that traditional foods may have in food security for Arctic populations. In other words, while these larger surveys have shown that food accessibility is clearly problematic in the Arctic, the nature of FI and the role of traditional food is largely unexamined.

The present paper highlights issues surrounding access to both market and traditional food as perceived by Yukon First Nations, Dene/Métis and Inuit women living in the Canadian Arctic.

MATERIAL AND METHODS

Between 1993 and 2000, researchers from the Centre for Indigenous Peoples' Nutrition and Environment (CINE) conducted three large cross-sectional studies to define risks and benefits of Indigenous Peoples' food systems in various Arctic Canadian communities. This article reports data from these studies. Data collection methods have been described in detail elsewhere (32-34) and are summarized here.

CINE researchers partnered with members of the Dene Nation, Métis Nation-NWT, Inuit Tapirisat of Canada, the Council of Yukon First Nations, and the Northern Contaminants Program. Research was conducted at the request of each of the Aboriginal organizations. Invitations to methodology workshops

were extended to representatives of all Dene/Métis and Yukon First Nations communities^{1*} and 39 Inuit communities. The three workshops, one in each cultural region, provided the platform for decisions regarding research questions and community selection for interviews. Workshop representatives chose the communities based on factors such as diversity of the local food system, community size, existing health concerns, and budget limitations. Research agreements were negotiated with each community and all participant interviewees provided written consent prior to data collection. The Committee on Human Research Ethics at McGill University approved this work, and research licenses were obtained from the Northwest Territories and Yukon.

Band, community, or hamlet membership lists were used to identify potential participants. Ten percent of each community, or 25 households, whichever was larger, were randomly sampled. Although both men and women were surveyed, only data from adult^{1†} Indigenous women are presented in this paper. Women were selected because they are at higher risk of food insecurity (1, 3) and are most often the gatekeepers to family food. A total of 1771 women were included: 422 Yukon First Nations, 511 Dene/Métis, and 838 Inuit.

Data were collected using socio-cultural questionnaires that were developed and pilot tested by CINE researchers. Participants of the methodology workshop reviewed all questions and judged the content and format to be acceptable. The same base question-

^{1*} with the exception of 6 communities that were already involved in similar dietary studies

^{1†} greater than or equal to 20 years old

naire was used in Yukon, Dene/Métis and Inuit regions, but some questions were added over the extended data collection period. Final versions of the questionnaire included 24 to 27 questions, including all questions reported here. Trained, local personnel collected data in the participants' homes over two seasons. Participants were categorized according to age (20-40, 41-60 and >60 years old) and region (Yukon, Dene/ Métis and Inuit), in order to facilitate data comparison within and between categories (35).

For this study, seven questions from the socio-cultural questionnaire were selected for analysis, because they were asked in all three regions, and were relevant to the topic of food access. All seven questions were close-ended with space to add comments. Chi-square tests were conducted to ascertain the distribution of subject responses across age and regional groups. Analyses were completed using Epi Info Version 6, with $p < 0.05$ being indicative of statistical significance for all analyses.

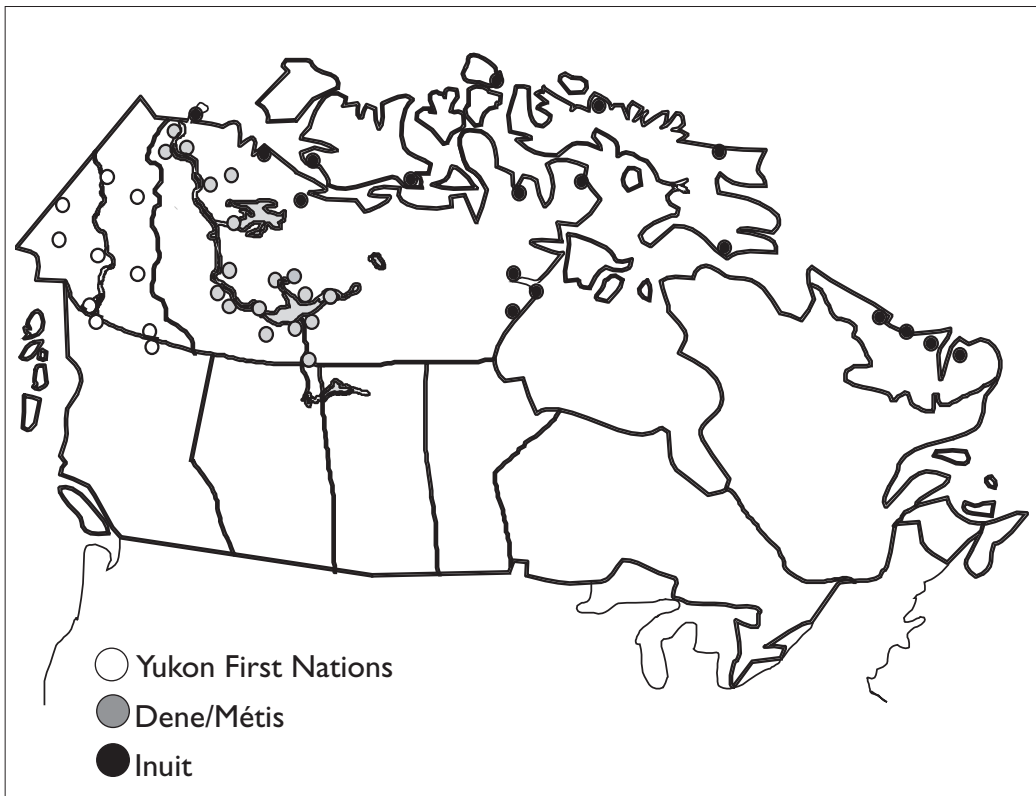


Figure 1. Participating communities.

RESULTS

Results are reported by age group (Table I) and by cultural region (Table II).

Question 1. “Could your family afford to buy all the food it needs from the store?”

There was considerable regional variation in the ability to afford adequate food, varying between 40% and 70% of the participants indicating that food was affordable. Within each region, perceived ability to afford food did not differ significantly by age. Across regions, however, significant differences were observed for participants <61 years of age ($p < 0.001$). Of those who offered additional comments, high cost of food and low/no income were, by far, the most common reasons for being unable to afford needed food (data not shown).

Question 2. “Does your household have enough equipment to go fishing for the family’s food needs?”

Sufficient fishing equipment was not a reality for up to half the participants. Yukon First Nations were most likely to have access to enough fishing equipment in the 20-40 and 61+ age groups ($p < 0.01$).

Within Yukon First Nations and Dene/Métis groups, age did not play a significant role regarding access to fishing equipment. Inuit women from the middle age category were significantly more likely ($p < 0.01$) than older or younger Inuit women to have sufficient fishing equipment.

Question 3. “Is the fishing equipment working?”^{1*}

Of the participants with access to fishing equipment, fewer than 5% from any age or

regional group indicated that their equipment was not working.

Question 4. “How costly is it to go fishing?”

Affordability of fishing varied greatly, with 31.5 to 79.1% of women from the various age and region groups indicating that it was within their means. Consistently, Yukon First Nations were most likely to feel that fishing was affordable ($p < 0.001$). It is important to note that the percentage of people from the 61+ age group who did not comment was significantly different across regions ($p < 0.05$), which may have affected this result.

Ability to afford fishing was not age-dependent among Yukon First Nations women. However, it was for Dene/Métis and Inuit. Among Dene/Métis, fishing became less affordable with age ($p < 0.05$). Capacity to afford fishing was comparable in the first two Inuit age groups but Inuit elders (61+ years) were less likely to have adequate funds for fishing ($p < 0.05$).

Question 5. “Does your household have enough equipment to go hunting for the family’s food needs?”

Forty-eight to 72.5% of participants’ households had access to hunting gear. Region did not influence hunting gear accessibility in the two older age groups. In contrast, when it came to 20-40 year olds, Inuit had less access than age-matched respondents from other regions ($p < 0.001$).

There were no age-related differences regarding access to enough hunting equipment among Yukon participants. Dene/Métis elders (61+ years old) were not as likely as younger Dene/Métis women to have adequate hunting

^{1*} this question was only asked when the participant had fishing equipment

Table 1. Percent of women's responses, by age across regions, to seven food accessibility questions.

Questions and responses	20-40 years			41-60 years			> 61 years					
	Dene/Métis (n = 280)	Yukon (n = 253)	Inuit (n = 501)	P	Dene/Métis (n = 136)	Yukon (n = 102)	Inuit (n = 245)	P	Dene/Métis (n = 95)	Yukon (n = 67)	Inuit (n = 92)	P
<i>1. Could your family afford to buy all the food it needs from the store?</i>												
Yes	70.0	56.1	40.1	<0.001*	65.4	56.9	42.9	<0.001*	57.9	62.7	48.9	0.199
No	26.4	41.5	58.3	<0.001*	30.1	40.2	55.1	<0.001*	41.0	35.8	48.9	0.330
<i>2. Does your household have enough equipment to go fishing for the family's food needs?</i>												
Yes	59.6	68.8	55.1	0.001*	64.0	73.5	67.8	0.294	48.4	76.1	50.0	0.001*
No	40.0	31.2	44.1	0.003*	35.3	26.5	31.8	0.349	50.5	23.9	48.9	0.001*
<i>3. Is the fishing equipment working?*</i>												
Yes	57.5	64.8	51.3	0.002*	61.6	66.7	62.8	0.720	45.2	71.6	48.9	0.002*
No	0.7	2.0	1.4	n/a	1.5	1.0	2.0	n/a	4.2	1.5	2.2	n/a
<i>4. How costly is it to go fishing?</i>												
Affordable	65.0	75.1	45.7	<0.001*	57.4	76.5	46.1	<0.001*	36.8	79.1	31.5	<0.001*
Not affordable	20.4	12.6	30.1	0.012*	26.5	10.0	36.3	<0.001*	36.8	7.5	40.2	<0.001*
<i>5. Does your household have enough equipment to go hunting for the family's food needs?</i>												
Yes	66.1	69.9	53.9	<0.001*	66.1	72.5	69.8	0.560	48.4	64.2	52.2	0.128
No	33.9	30.0	45.1	<0.001*	33.1	27.4	29.8	0.560	50.5	35.0	46.7	0.169
<i>6. Is the hunting gear working?*</i>												
Yes	61.8	67.2	49.7	<0.001*	63.2	69.6	62.4	0.432	46.3	61.2	50.0	0.163
No	1.8	0.8	1.4	n/a	1.5	0.0	1.6	n/a	2.1	1.5	0.0	n/a
<i>7. How costly is it to go hunting?</i>												
Affordable	62.1	71.9	36.7	<0.001*	53.7	68.6	35.1	<0.001*	36.8	64.2	27.4	<0.001*
Not affordable	24.3	14.2	37.7	<0.001*	32.4	14.7	46.1	<0.001*	35.8	11.9	42.1	<0.001*

Percentages may not add to 100%: missing information and other responses constitute the difference

* Question was only asked of participants who had access to such equipment

Table II. Percent of women's responses, by age within regions, to seven food accessibility questions.

Questions and responses	Dene/Métis		Yukon First Nations		Inuit		P
	20-40 years (n = 280)	>61 years (n = 136)	20-40 years (n = 253)	>61 years (n = 67)	20-40 years (n = 501)	>61 years (n = 92)	
<i>1. Could your family afford to buy all the food it needs from the store?</i>							
Yes	70.0	65.4	56.1	62.7	40.1	42.9	0.272
No	26.4	30.1	41.5	35.8	58.3	55.1	0.225
<i>2. Does your household have enough equipment to go fishing for the family's food needs?</i>							
Yes	59.6	64.0	68.8	76.1	55.1	67.8	0.001*
No	40.0	35.3	31.2	23.9	44.1	31.8	0.002*
<i>3. Is the fishing equipment working?*</i>							
Yes	57.5	61.6	64.8	71.6	51.3	62.8	0.006*
No	0.7	1.5	2.0	1.5	1.4	2.0	n/a
<i>4. How costly is it to go fishing?</i>							
Affordable	65.0	57.4	75.1	79.1	45.7	46.1	0.033*
Not affordable	20.4	26.5	12.6	7.5	30.1	36.3	0.073
<i>5. Does your household have enough equipment to go hunting for the family's food needs?</i>							
Yes	66.1	66.1	69.9	72.5	53.9	69.8	<0.001*
No	33.9	33.1	30.0	27.4	45.1	29.8	<0.001*
<i>6. Is the hunting gear working?*</i>							
Yes	61.8	63.2	67.2	61.2	49.7	62.4	0.004*
No	1.8	1.5	0.8	0.0	1.4	1.6	n/a
<i>7. How costly is it to go hunting?</i>							
Affordable	62.1	53.7	71.9	64.2	36.7	35.1	0.212
Not affordable	24.3	32.4	14.2	11.9	37.7	46.1	0.516

Percentages may not add to 100%: missing information and other responses constitute the difference

* Question was only asked of participants who had access to such equipment

equipment ($p < 0.01$). Among Inuit women, those from the middle age group were most likely to report having enough hunting equipment ($p < 0.001$).

Question 6. “Is the hunting gear working?”^{1#}

Of the participants with access to hunting gear, fewer than 3% from any age or regional group had non-functioning equipment.

Question 7. “How costly is it to go hunting?”

Perceived hunting affordability was quite variable, ranging from approximately 1/4 to 3/4 of participants who considered hunting financially attainable. In all age groups, Yukon First Nations women were most likely to feel that hunting was affordable ($p < 0.001$).

Hunting affordability decreased significantly with age within the Dene/Métis group ($p < 0.001$). It is important to note that the ‘other’ responses increased significantly with age ($p < 0.05$), so it is plausible that differences in how the age groups answered the question caused the significant, age-related difference in perception of hunting cost. Hunting affordability was not age-dependent among Yukon First Nations or Inuit participants.

DISCUSSION

Among Dene/Métis, age played a significant role in access to functional fishing equipment, affordability of fishing, access to enough hunting equipment, access to functional hunting equipment, and affordability of hunting. In all cases, elders (61+ years) had more limited access to hunting and fishing equipment. It is important

to note that for questions four, six and seven, the percentage of elders who did not comment, or who gave other responses, was significantly higher than that of younger participants. It is thus possible that differences in how the questions were answered caused the significant, age-related differences.

Interestingly, age did not significantly impact any of the Yukon First Nations’ responses. Regardless of age, people in this region have comparable access to food resources.

Among Inuit, age was a factor regarding access to fishing equipment, access to functional fishing equipment, affordability of fishing, access to adequate hunting equipment, and access to functional hunting equipment. In this cultural region, the middle age group tended to have greatest access to traditional food resources. Other or non-responses were significantly different for questions three and six; these age-related differences may therefore reflect, in part, discrepancies in how the participants responded rather than actual differences in access to functional fishing and hunting gear.

Consistent with previous research (2, 3, 18), the first question from this study confirms that access to market food is a major barrier to achieving food security in Arctic Canada. Twenty-six to 58.3% of participants indicated that they could not afford all the food they needed. If this result is considered as a proxy indicator, FI in this population greatly exceeds the national FI average of 14.7% (3).

Striking regional differences were observed in terms of perceived affordability of hunting and fishing. Fishing was not considered affordable by up to 12.6% of Yukon First Nations, 36.8% of Dene/Métis, and 40.2% of Inuit

^{1#} this question was only asked when the participant had hunting equipment

women. Hunting was considered to be too expensive by up to 14.7% of Yukon First Nations, 35.8% of Dene/Métis, and 42.1% of Inuit. Although it is an important matter in all regions, the unique regional issues regarding traditional food accessibility need to be addressed in future efforts to improve food security in the Arctic.

To our knowledge, this is the first large-scale study to inquire about access to the equipment necessary for traditional food harvest. This study shows that up to half of the study population did not have access to fishing and hunting equipment: 23.9-50.5% said they did not have access to enough fishing equipment, and 27.4-50.5% did not have enough equipment to go hunting for the family's food needs. Without access to hunting and fishing equipment, the negative nutritional consequences that occur with decreasing use of traditional food (9, 36) and FI would be expected.

Conclusions

Food insecurity is a complex problem that is uniquely expressed across different segments of the Canadian population. Food security surveillance in the Arctic needs to accurately reflect the distinct food affordability and access issues of traditional and market food resources. Although the governmental Food Mail Program has made a significant contribution to the affordability of market foods in many northern communities (22), food security can be greatly improved by further improving the affordability of market food, and by increasing the affordability and accessibility to fishing and hunting in Yukon First Nations, Dene/Métis and Inuit communities.

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