

# Food Insecurity among Inuit Women Exacerbated by Socio-economic Stresses and Climate Change

Maude C. Beaumier, BSc, James D. Ford, PhD

## ABSTRACT

**Objectives:** To identify and characterize the determinants of food insecurity among Inuit women.

**Methods:** A community-based study in Igloolik, Nunavut, using semi-structured interviews (n=36) and focus groups (n=5) with Inuit women, and key informants interviews with health professionals (n=13).

**Results:** There is a high prevalence of food insecurity among Inuit females in Igloolik, with women in the study reporting skipping meals and reducing food intake on a regular basis. Food insecurity is largely transitory in nature and influenced by food affordability and budgeting; food knowledge; education and preferences; food quality and availability; absence of a full-time hunter in the household; cost of harvesting; poverty; and addiction. These determinants are operating in the context of changing livelihoods and climate-related stresses.

**Conclusion:** Inuit women's food insecurity in Igloolik is the outcome of multiple determinants operating at different spatial-temporal scales. Climate change and external socio-economic stresses are exacerbating difficulties in obtaining sufficient food. Coping strategies currently utilized to manage food insecurity are largely reactive and short-term in nature, and could increase food system vulnerability to future stresses. Intervention by local, territorial and federal governments is required to implement, coordinate and monitor strategies to enhance women's food security, strengthen the food system, and reduce vulnerability to future stressors.

**Key words:** Food security; food insecurity; Inuit; women; Nunavut; climate change; social determinants of health

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Food security exists when people at all times can acquire safe, nutritionally adequate, and culturally acceptable foods in a manner that maintains human dignity.<sup>1-3</sup> Food insecurity occurs when food systems are stressed so that food is not accessible, available, and/or of sufficient quality. The highest incidence of food insecurity in Canada has been reported in Nunavut where 56% of the Inuit population is classed as food-insecure.<sup>4</sup> At the community level, prevalence as high as 64% and 83% were reported in Igloolik<sup>5</sup> and Kugaaruk<sup>6</sup> (NU), respectively. This significantly exceeds the Canadian average of 14.7%.<sup>4</sup>

Inuit food systems combine store foods and country foods derived from subsistence hunting and fishing. While the dual nature of the Inuit food system is important in creating diversity in food supply, the isolation of Inuit settlements, high rates of unemployment, and acculturative stresses, have created significant food insecurity and Inuit women are believed to be particularly vulnerable.<sup>5,7-9</sup> Food inadequacy is often associated with poor health and may have serious physical, mental and social health implications, causing increased susceptibility to infection and chronic health afflictions.<sup>10-13</sup>

While there is an emerging body of research identifying determinants of Inuit food insecurity,<sup>11,14-18</sup> few studies have assessed how multiple stressors operating at different spatial and temporal scales affect food security, particularly of Inuit women. This knowledge gap has been identified as limiting intervention to reduce food insecurity at a local, territorial, and federal level.<sup>16,18</sup>

This study identifies and characterizes the determinants of food insecurity among Inuit women using an in-depth case study from the community of Igloolik, Nunavut, focusing on how multiple stresses affect the access, availability and quality of food.

## METHODS

### Case study approach

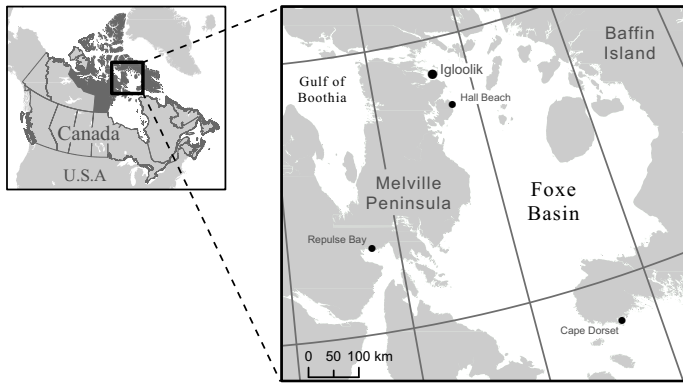
The use of community case studies is a well-established approach in food system research, allowing in-depth analysis of the processes and conditions shaping the access, availability and quality of food.<sup>16,17,19,20</sup> This study builds upon previous research in Igloolik, Nunavut, in which food insecurity was identified as a major concern.<sup>5,18</sup> Igloolik is a coastal community of 1,538 people (95% Inuit)<sup>21</sup> located on Igloolik Island in the Canadian High Arctic (Figure 1). Typical for Nunavut, the community has an economy consisting of waged employment and subsistence hunting with country foods being an important component of the food system. Community socio-economic indicators are provided in Table 1.

### Author Affiliations

Department of Geography, McGill University, Montreal, QC

**Correspondence:** Dr. James D. Ford, Assistant Professor, Department of Geography, McGill University, Room 308C Burnside Hall, 805 Sherbrooke St. W., Montreal, QC H3A 2K6, Tel: 514-398-4960, Fax: 514-398-7437, E-mail: james.ford@mcgill.ca

**Conflict of Interest:** None to declare.

**Figure 1.** Igloolik, Nunavut<sup>18</sup>

### Data collection and analysis

A mixed methods approach was employed to characterize the experience of food insecurity among Inuit women and identify the local and broader-scale determinants of food insecurity, including one-on-one semi-structured interviews with Inuit women (n=36), focus groups (n=5) with 19 women, and interviews with key informants (health and educational professionals, governmental representatives, store managers) (n=13). Women participants were aged 18+, permanent residents of Igloolik, and selected using a purposive sampling method (see ref. 22). Sample characteristics are included in Tables 2 and 3.

The research team was composed of one male and one female scientist, and one male and one female local Inuit research assistant. Focus groups and interviews were conducted by the female researcher and female research assistant/interpreter, to moderate cross-gender and cross-cultural sensitivities. An interview and focus group guide identifying key themes (Table 4) was used to allow for flexibility in questioning while maintaining some structure. Focus groups were conducted to expand on data collected during interviews and to validate preliminary findings, with participants selected from interviewees. An environmental scan and participant observation techniques were used to collect contextual information on the determinants of food insecurity, and involved taking part in everyday activities in the community during three months of fieldwork (fall 2008, winter 2009).<sup>22</sup>

The study followed ethical norms for working with Inuit communities in Nunavut, including obtaining university ethics approval, a research licence from the Nunavut Research Institute, and eliciting informed consent from all study participants. Confidentiality was preserved when demanded by the participant. Rigor was established using member checking, respondent quotes and triangulation of informants and methods.<sup>23</sup>

Content analysis was performed in QSR NVivo to identify key themes and meanings concerning food insecurity determinants. Concept mapping was then used to illustrate determinants identified from the content analysis and describe the relationships between various drivers operating at multiple spatial temporal scales.

## RESULTS

### Experience of food insecurity among women in Igloolik

Participants in this study described experiencing food insecurity on a regular basis. More than half expressed being anxious about

**Table 1.** Socio-economic Characteristics of Igloolik, Nunavut and Canada in General<sup>18</sup>

Characteristic	Igloolik	Canada
Employment rate <sup>24*</sup>	43.6	62.4
Unemployment rate (%) <sup>*</sup>	16.1	6.6
Median age <sup>*</sup>	18.9	39.5
Average household size <sup>*</sup>	4.7	2.5
Average per capita earnings (\$CAD) <sup>†</sup>	20,156	31,757
Life expectancy <sup>‡</sup>	67.2	77.2
	69.6 (women)	82.1
Human development index <sup>§</sup>	0.75 (NU)	0.88

\* 2006 Canadian Census

† 2001 Canadian Census

‡ 2002 data from [http://www.statcan.ca/english/freepub/84F0211XIE/2002/tables/html/t027\\_en.htm](http://www.statcan.ca/english/freepub/84F0211XIE/2002/tables/html/t027_en.htm). Note: these data are the average for Nunavut as a whole.

§ Data from Senécal and Guimond.<sup>25</sup> Human development index calculated based on life expectancy, education (literacy/knowledge), income per capita (access to goods and services). Note: these data are the average for Nunavut as a whole.

**Table 2.** Personal Characteristics of Participants

Women's Characteristics	Women (n)	Percent	
Age (years)	21-30	6	17
	31-40	17	47
	41-50	6	17
	51-70	7	19
Employed	Full time	7	19
	Part time	4	11
Unemployed	n/a	26	72

**Table 3.** Household Characteristics of Participants

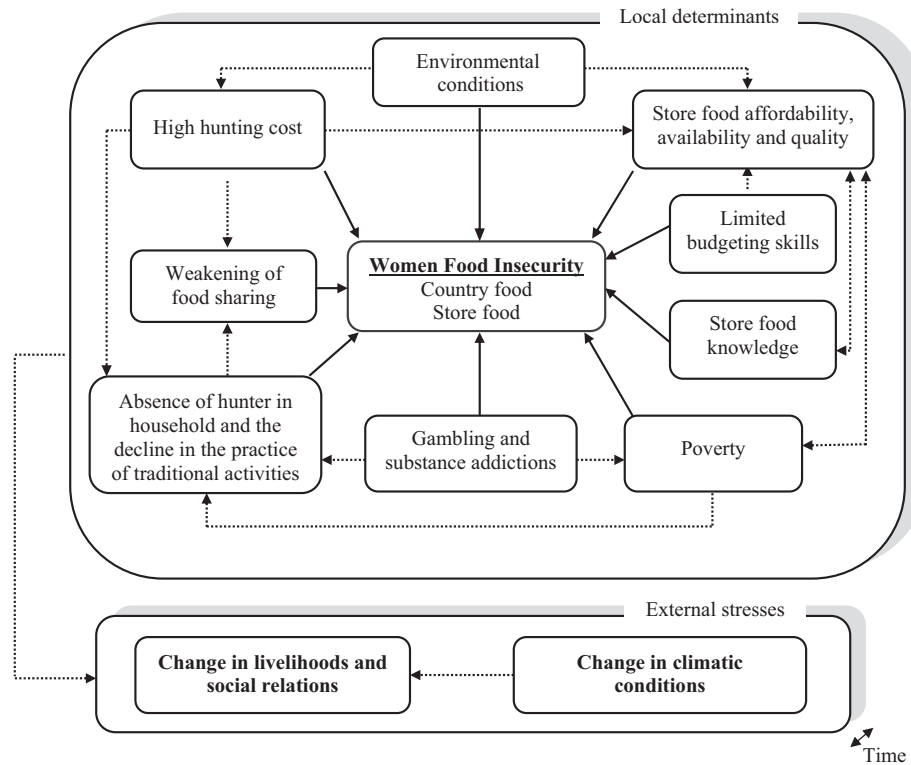
Household Characteristics	Women (n)	Percent	
Number of children under 18	1-3	19	53
	4-6	15	42
	>6	2	6
Total number of people	3-5	14	39
	6-8	17	47
	>9	5	14
Number of full-time hunters	1 or 2	2	6
Number of occasional hunters	1	15	42
Number of people employed full time	1-3	19	53
Number of people employed part time	1	13	36

**Table 4.** Topics Covered during Semi-structured Interviews

Key Theme	Example of Topics Covered
Personal information	<ul style="list-style-type: none"> <li>Age</li> <li>Household/family characteristics</li> <li>Employment and hunting status</li> <li>Length of time in the community</li> </ul>
Food system	<ul style="list-style-type: none"> <li>Importance of country foods, store foods</li> <li>Inter- and intra-community food-sharing networks</li> <li>Experience of hunger</li> </ul>
Store foods	<ul style="list-style-type: none"> <li>Community support (food bank, community feast)</li> <li>Access</li> <li>Availability</li> <li>Quality</li> <li>Change over time (by week, month, season, year, decade)</li> </ul>
Country foods	<ul style="list-style-type: none"> <li>Access</li> <li>Availability</li> <li>Quality</li> <li>Change over time (by week, month, season, year, decade)</li> </ul>
Health	<ul style="list-style-type: none"> <li>Mental (stress, worries)</li> <li>Social (strength of social network)</li> <li>Physical (weight loss, food-related disease)</li> <li>Healthy eating habits perception and knowledge</li> </ul>
External stresses	<ul style="list-style-type: none"> <li>Documented changes</li> <li>Current and future impact</li> </ul>
Future trends and concerns	<ul style="list-style-type: none"> <li>Perceived future trends and concerns</li> <li>Implications for food security</li> <li>Coping mechanisms</li> <li>Policy options</li> </ul>

running out of food in the previous year. Forty percent noted not having eaten enough at least once in the previous year and 76%

**Figure 2.** Determinants of food insecurity among Inuit women in Igloolik, NU



**Table 5.** Price and Income Trends for the Period 1991 to 2006<sup>18</sup>

Item	% Increase 1991-2001	Average Increase per Year 1991-2001	% Increase 2001-2006	Average Increase per Year 2001-2006
Gasoline*	11	1.1	35	7
Food*	15	1.5	10	2
Shelter*	11	1.1	18	3.6
Household heating fuel*	22	2.2	50	10
Average per capita earnings†	20	2	n/a	n/a
Median income‡	n/a	n/a	26	4.3

\* Price data for 1991-2006 are from Yellowknife, Northwest Territories, and can be assumed to be broadly representative of prices in Nunavut. Systematic price data in these categories are not published for Nunavut. Data from Statistics Canada.

† Average earning data are specific to Igloolik and are taken from the 1991, 1996, and 2001 censuses. The 2006 census switched to measuring median income and is not reporting average earnings.

‡ Median income was measured in the census only in 2001 and 2006.

reported skipping meals and cutting the size of their meals to let other members of their family eat first. Country food was described as being particularly under stress with 85% of women reporting a decrease in the access and availability of country foods in 2008-2009, especially caribou meat. Interviewees described gendered dimensions to food insecurity, with women being typically the last to eat in the household to ensure that members of their family, especially children, eat enough. Some women, especially elders, indicated allowing men to eat first if food is limited because of energy needed to hunt.

*“As long as my family eats, I don’t care if I don’t eat, as long as they eat.”* (Lydia)

**Determinants of Inuit women’s food insecurity and external stresses**

Figure 2 summarizes the main determinants and external stresses of food insecurity among Inuit females in Igloolik and interaction between determinants and across scales. These determinants arise from thematic analysis of interview content and were validated by participants.

*Store Food Affordability, Availability and Quality*

The majority of women identified price, availability and quality of store food as constraining their ability to obtain sufficient food. In fact, the cost of a basket of food in Igloolik is twice as high as in Montreal<sup>22</sup> due to transportation distance and small population base.<sup>6</sup> There has been significant price inflation in recent years,<sup>18</sup> and many interviewees noted not being able to afford store foods on a regular basis in light of increasing prices. The ability to access fresh produce and plan healthy meals is also limited by the quality of the food at the store. Long transportation distances and weather-related delays in shipping often result in fresh foods being close to or exceeding their expiry date.

*Poverty*

Many women in this study described living in conditions characteristic of poverty, and in some cases extreme poverty: not being able to afford daily needs and pay bills, living in overcrowded housing, and having to liquidate assets to meet needs. Not being able to afford to eat was described as occurring at least once in the previous year by all participants. Poverty was described as a major bar-

rier to food security and is an acute problem in the North where the cost of living is considerably higher than other regions, household income lower, and employment opportunities limited (Table 1).

*"There is a lot of poverty in Igloolik. Children go to school without eating."* (Leah I.)

#### *Store Food Knowledge*

Health professionals have noted that women have limited knowledge on store foods, which constrains their ability to make informed food choices and decreases the number of food options in the store. Moreover, it constrains women's ability to substitute country foods with affordable and healthy store foods when required. Interviewees noted that cooking classes given by the Canada Prenatal Nutrition Program were useful but that more programs are needed.

*"I think we need more [program promoting healthy eating]. Head Start is great, it helps us to cook properly and helps us knowing how to buy stuff so that our meals get bigger."* (Leah A.)

#### *Gambling and Substance Addictions*

Substance addiction and gambling were identified as important determinants of food insecurity. In addition to taking away money needed for purchasing food and engaging in hunting activities, gambling and addiction negatively affects important food-sharing networks, disrupts household dynamics, and strains family relationships, to the extent that access to food is constrained for some women.

*"[People share less today] because of the money, the drugs, the alcohol, and the gambling."* (Anonymous)

#### *High Hunting Costs*

High hunting costs were identified by all women as reducing the availability of country foods. Modern hunting is capital intensive requiring expensive equipment, and price inflation is limiting the ability of many to participate in hunting activities<sup>18</sup> (Table 2). To alleviate cost of hunting, hunters have recently started to sell country foods, a trend not reported in other studies in this community.<sup>5,18,26</sup> Fifteen percent of women admitted having paid a hunter for country foods at least once in the previous year. While for some this improves access to country foods, many women were concerned that replacing sharing networks with a cash transaction could limit access to only those who can afford to pay.

*"More and more people are trying to sell country food through radio and I am uncomfortable to buy it. [...] God made these foods for us, for all of us, it wasn't for money, it's for us."* (Daphne)

#### *Budgeting Skills*

The majority of key informants emphasized budgeting skills to be a challenge to food security. Women in the study also revealed having difficulties in planning their expenses, and many described running out of food before they could afford to get more. Food budget was described as being more flexible than other expenses, with women cutting down on food expenses when power bills and house rent payment are due. Difficulty in budgeting in part reflects the relatively recent arrival of monetary transactions and limited experience in Inuit culture of western concepts of budgeting and money management which are important in the contemporary Inuit community.<sup>27</sup>

*"Every 2 weeks, my husband gets paid, so it's hard for me to plan all the food for 2 weeks."* (Leslie)

#### *Decline in the Practice of Traditional Activities and Absence of Hunters in the Household or Closed Family*

In this study, women who did not have a hunter in their household or in the extended family described having less access to country foods than those who did. Most participants were concerned about the decrease in the number of people hunting full time, due to illness, injuries, death and, more importantly, the lack of young individuals taking over full-time hunting roles as elder Inuit reduce their hunting activity. This trend was noted across the Arctic.<sup>28-30</sup> A decline in the number of full-time hunters also has implications for other determinants of food insecurity, including affordability, harvesting costs and food sharing.

*"I'd say [I eat country food] 3-4 times a year. Now that my parents are living [elsewhere] and my common law's father recently passed away and he was the only one giving us country food [...] we barely have country food for ourselves."* (Iris)

#### *Weakening of Food Sharing*

Country foods have historically been widely shared in the extended household unit in Igloolik, a trend which remains important today and underpins the food security of many households.<sup>26</sup> However, women in the study noted decreased food sharing within the community in recent years. With increasing hunting cost, and the scarcity of caribou and walrus, hunters are increasingly reluctant to share country foods. Some women have revealed being hesitant now to ask for country foods because they are afraid of the community's judgement.

*"The reason why these hunters are hesitant to give country food is because the cost of gas has gone up so high that they worry that if they give country food out, their supply will not last and they will not have money to buy the gas to make another trip."* (Anonymous)

*"[when I have a hard time to get store food] I look for people that won't look down on me if I ask for assistance. There are people that look down on you."* (Anonymous)

#### *Environmental Conditions*

Environmental conditions have important linkages to food security. Store foods are largely imported to the community by air-freight and are sensitive to weather conditions. Flight delays due to high winds, blizzard and fog are common, during which fresh produce is often unavailable. The country food component of the Igloolik food system is also sensitive to environmental conditions. Igloolik is located on a small island with access to hunting areas dependent on sea ice trail conditions from early November to July, and boat access during the summer open-water period. Particularly during ice freeze-up and break-up, women described limited availability of country foods to be a common occurrence due to the inability to hunt at this time. Transitory food insecurity is common during these shoulder seasons which have historically been times of limited country food availability.<sup>31</sup>

There is widespread evidence of climate change in the Igloolik region as documented by Inuit traditional knowledge and instrumental datasets, including later and longer ice free-up, thinner ice, absence of summer pack ice, increasing temperatures, and chang-



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ing weather patterns.<sup>26,32-34</sup> Women in this study were aware of these changes, although in general did not make a connection between changing environmental conditions and food availability: this connection is largely made by the men who hunt and have first-hand experience of changing conditions and their implications. Women have noted that declining availability of walrus, caribou and seal meat in recent years is related to these changes<sup>34</sup> which they in turn relate to their difficulty in obtaining country foods.

*“When the ice used to be plentiful around here, there was numerous and numerous walrus. That’s not so anymore. We have not caught any walrus, near from here around yet this year.”* (Anonymous)

## DISCUSSION

### Interaction between determinants

The food security status of Inuit women in this study is influenced by social, economic, political and environmental conditions and processes which interact over multiple spatial and temporal scales. Changing climatic conditions are exacerbating the food security implications of a decline in the number of full-time hunters and declining number of youth hunting full time. Adapting to changing accessibility and safety of hunting requires well-developed understanding of ice conditions, weather patterns, and animal movements, which only full-time experienced hunters have.<sup>26</sup> Consequently, climate change is reinforcing the trend of reduced participation in hunting among youth with implications for country food availability. Similarly, increasing gasoline prices are making some climate adaptations more expensive and out of the reach of some households: many adaptations to changing ice conditions involve developing new but longer trail networks.<sup>26,34</sup> With reduced availability of country foods, sharing networks are negatively impacted and it is often women who suffer the most by reducing food consumption, particularly in households without the financial ability to afford store foods.

### Coping mechanisms

Coping strategies are widely employed to manage food insecurity. The sharing of country foods has traditionally underpinned food security, particularly for non-hunting and poor households,<sup>15,18,35-37</sup> and remains important today. Store foods are also widely shared, although usually women have to ask for store items; in contrast, country foods are often brought to households by hunters when food is available. Many participants described relying on sharing networks to maintain some degree of food access and availability during times of need.

*“Many many people come to get food from me. Like sugar, if my next door neighbour runs out, I’ll fill up the pot, or another one will ask for tea.”* (Jacky)

Women widely reported modifying their eating patterns, such as drinking more tea or coffee to hide hunger, or getting used to not eating breakfast. Compromising nutritional intake over the long term may have adverse health implications and lead to nutritional deficiency.<sup>8,13,38,39</sup>

*“I told my children not to eat in the morning and have lunch instead. When they learned not to eat in the morning they were not hungry.”* (Anonymous)

The liquidation of assets (home items, hunting gear) was described as a coping mechanism by some as a means of obtaining sufficient funds to purchase food. Assets are often liquidated at a low price when money is needed rapidly, which can be a detriment to future food security as physical capital decreases.

*“If things get too hard, I myself have to sell one of my jackets or my boots.”* (Iris)

### Long-term vulnerabilities

Current coping mechanisms are used to moderate food insecurity and are mostly short-term and reactive in nature. In many instances, coping strategies increase vulnerability to food insecurity over the long term, increasing the risk of chronic food insecurity. As women compromise their health and deplete available capital to access food of acceptable value, they reduce their ability to avoid, resist and recover from climatic and non-climatic stresses.<sup>18</sup> In the context of a rapidly changing climate, the food system is particularly vulnerable to back-to-back climate-related shocks that are projected to become more common with climate change, including the possibility of successive late and long ice freeze-ups and continued absence of floating ice in summer months.<sup>26,32-34</sup> Such a scenario, in combination with price inflation, would exceed the coping mechanisms of many women.

### Policy opportunities

Opportunities for targeted intervention to increase food security elaborated with participants, and explored in depth elsewhere,<sup>22</sup> include: 1) education campaigns on healthy eating focused on store foods; 2) maintaining and improving harvester support programs to maintain viability of hunting sector; 3) strengthening food systems at key times of the year when country foods are not accessible, including subsidizing healthy store foods and development of a food bank; and 4) facilitating inter-community sharing/trading. At a broader level, ongoing policy initiatives are required to tackle poverty, lack of economic opportunities, and addiction and substance abuse which contribute not only to food insecurity but to poor health status in general.

## CONCLUSION

This study presents an exploratory analysis of the determinants of Inuit women’s food insecurity in Igloodik, Nunavut. Women in the study revealed skipping meals and reducing food intake on a regular basis, in addition to having experienced a decrease in access to country food. Food insecurity poses a major challenge, primarily as a pressing public health problem, and also by creating vulnerabilities to climate change and socio-economic stresses. Few studies have focused on the food security of Inuit women in Nunavut. This is one of the first studies linking climate change and food insecurity. Further research is required to assess in greater detail the experience of food insecurity of women in other Inuit communities, and should be part of a longer-term strategy of health intervention and climate change planning to ensure Inuit have comparable health to all Canadians.

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## RÉSUMÉ

**Objectifs :** Mettre en évidence et caractériser les déterminants de l'insécurité alimentaire chez les femmes inuites.

**Méthode :** Étude locale menée à Igloolik (Nunavut) à l'aide d'entrevues semi-dirigées (n=36) et de groupes de discussion (n=5) avec des femmes inuites, et d'entrevues avec des informateurs issus des professions de la santé (n=13).

**Résultats :** La prévalence de l'insécurité alimentaire est forte chez les femmes inuites d'Igloolik; les femmes de notre étude ont déclaré qu'elles sautaient des repas et qu'elles réduisaient régulièrement leurs rations alimentaires. Cette insécurité alimentaire est en grande partie transitoire; elle dépend de l'abordabilité des aliments et du budget; des connaissances en alimentation; de la scolarité et des préférences; de la qualité et de la disponibilité des aliments; de l'absence d'un chasseur à plein temps dans le ménage; du coût de la récolte; de la pauvreté; et de la toxicomanie. Ces déterminants se manifestent dans un contexte de stress lié au changement des moyens de subsistance et du climat.

**Conclusion :** L'insécurité alimentaire des femmes inuites d'Igloolik résulte de nombreux déterminants qui se manifestent à différentes échelles spatio-temporelles. Le stress dû au changement climatique et aux facteurs socioéconomiques externes exacerbe les difficultés à obtenir des aliments en quantité suffisante. Les stratégies d'adaptation utilisées actuellement pour gérer l'insécurité alimentaire sont pour la plupart réactives et à court terme, et elles pourraient augmenter la vulnérabilité du circuit alimentaire aux stress futurs. Une intervention des administrations locale, territoriale et fédérale est nécessaire pour mettre en œuvre, coordonner et surveiller des stratégies visant à améliorer la sécurité alimentaire des femmes, à renforcer le circuit alimentaire et à réduire la vulnérabilité aux futurs agents stressants.

**Mots clés :** sécurité alimentaire; insécurité alimentaire; Inuits; femmes; Nunavut; changement climatique; déterminants sociaux de la santé