

**EVALUATING FOOD SECURITY IN NUNAVUT:  
PRELIMINARY RESULTS FROM THE INUIT HEALTH  
SURVEY**

by

Renata Rosol  
B.Sc. in Agriculture, McGill University, 2002

RESEARCH PROJECT  
SUBMITTED IN PARTIAL FULFILLMENT OF  
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF PUBLIC HEALTH

In the  
Faculty of Health Sciences

© Renata Rosol 2009

SIMON FRASER UNIVERSITY

Summer 2009

All rights reserved. However, in accordance with the *Copyright Act of Canada*, this work may be reproduced, without authorization, under the conditions for *Fair Dealing*. Therefore, limited reproduction of this work for the purposes of private study, research, criticism, review and news reporting is likely to be in accordance with the law, particularly if cited appropriately.

## APPROVAL PAGE

STUDENT'S NAME: Renata Rosol

DEGREE: MASTER OF PUBLIC HEALTH

THESIS TITLE: **EVALUATING FOOD SECURITY IN  
NUNAVUT: PRELIMINARY RESULTS FROM  
THE INUIT HEALTH SURVEY**

Chair Of Defense:

---

Dr. Jeremy Snyder  
Assistant Professor  
Faculty of Health Sciences

Senior Supervisor:

---

Dr. Lorraine Halinka Malcoe  
Associate Professor  
Faculty of Health Sciences

Supervisor:

---

Dr. Grace Egeland  
Associate Professor,  
School of Dietetics and Human Nutrition  
McGill University

External:

---

Dr. Rochelle Tucker  
Assistant Professor  
Faculty of Health Sciences

Date Defended / Approved: May 20, 2009



SIMON FRASER UNIVERSITY  
LIBRARY

## Declaration of Partial Copyright Licence

The author, whose copyright is declared on the title page of this work, has granted to Simon Fraser University the right to lend this thesis, project or extended essay to users of the Simon Fraser University Library, and to make partial or single copies only for such users or in response to a request from the library of any other university, or other educational institution, on its own behalf or for one of its users.

The author has further granted permission to Simon Fraser University to keep or make a digital copy for use in its circulating collection (currently available to the public at the "Institutional Repository" link of the SFU Library website <[www.lib.sfu.ca](http://www.lib.sfu.ca)> at: <<http://ir.lib.sfu.ca/handle/1892/112>>) and, without changing the content, to translate the thesis/project or extended essays, if technically possible, to any medium or format for the purpose of preservation of the digital work.

The author has further agreed that permission for multiple copying of this work for scholarly purposes may be granted by either the author or the Dean of Graduate Studies.

It is understood that copying or publication of this work for financial gain shall not be allowed without the author's written permission.

Permission for public performance, or limited permission for private scholarly use, of any multimedia materials forming part of this work, may have been granted by the author. This information may be found on the separately catalogued multimedia material and in the signed Partial Copyright Licence.

While licensing SFU to permit the above uses, the author retains copyright in the thesis, project or extended essays, including the right to change the work for subsequent purposes, including editing and publishing the work in whole or in part, and licensing other parties, as the author may desire.

The original Partial Copyright Licence attesting to these terms, and signed by this author, may be found in the original bound copy of this work, retained in the Simon Fraser University Archive.

Simon Fraser University Library  
Burnaby, BC, Canada

## **ABSTRACT**

This research paper reports on the food security status, general household and country food (CF) characteristics of the Kivalliq and Qikiqtaaluk regions in Nunavut. A community-participatory, cross-sectional Inuit Health Survey was conducted among self-identified Inuit adults in the Canadian north in the summer and fall of 2007 and 2008. A total of 1,038 randomly selected households completed a household questionnaire. Food insecurity affected 70.5% of participating Inuit households; 32.2% of households were moderately food insecure and 38.3% were severely food insecure. Households with children reported significantly higher rates of food insecurity ( $p=0.0056$ ) and severe food insecurity ( $p=0.0001$ ) compared to households without children. Approximately 65% of Inuit households reported an active hunter, 79% would prefer to eat more CF than they can get, and 54% of households relied on family and friends for CF. Inuit-specific data for Nunavut will inform future monitoring activities and help guide future policies and programs.

**Keywords:** food insecurity; Inuit; country food; Nunavut; survey; policy

## **SPECIAL CONSIDERATIONS**

The Inuit Health Survey, “Qanuippitali, how about us, how are we”, came as a result of consultations with the Government of Nunavut, local Inuit organizations, and individual communities in Nunavut. The project was developed in a community participatory process and is co-owned by the government of Nunavut Health and Social Services. Inuit are co-users of the database as they guide the use of the data through Inuit and community representation on the Nunavut steering committee. As outlined by the research agreements signed with participating communities, all results from data analyses must be reviewed by the Nunavut steering committee and shared with the communities before results are to be disseminated through conferences and/or publications. However, student presentations in student forums are allowed prior to informing communities and as such should be considered privileged information until full dissemination of information to communities takes place. In this way, Inuit own the data and in the process ensure that the results return to the territory to guide future policy and program interventions, and reduce health inequities.

## **ACKNOWLEDGEMENTS**

I graciously acknowledge the participation and contribution made by all participants who consented to take part in this important survey. Without them there would be no data and no information for the territory of Nunavut, therefore their participation was vital to the success of the survey. Participants remained a priority throughout the survey and all individuals received their own personal and private results as quickly as possible.

This survey would not have been possible without the support from individual Hamlet Councils, local Inuit organizations and the Government of Nunavut. Thank you very much for your support, and your continued involvement in data dissemination and communication.

I am forever grateful to Dr. Grace Egeland for providing me the opportunity to work on a very exciting and important project, and for giving me the chance to delve deeper into an area of grave importance to Inuit. I also want to thank Dr. Egeland for her guidance, comments and constructive feedback. I am very thankful and indebted to Dr. Lorraine Halinka Malcoe, my senior supervisor, for her insights, helpful feedback and encouragement during the course of this project. Her ideas, comments and constructive criticisms throughout the Masters project were invaluable.

## TABLE OF CONTENTS

Approval.....	ii
Abstract.....	iii
Special Considerations.....	iv
Acknowledgements.....	v
Table of Contents.....	vi
List of Tables.....	viii
List of Figures.....	ix
List of Appendices.....	x
Background.....	1
Food Security.....	3
Traditional / Country Food.....	6
Main Barriers to Food Security.....	7
Programs Addressing Food Security in the Canadian North.....	8
Rationale.....	10
Research Questions.....	11
Methods.....	12
Study Area and Survey Sample.....	12
Research Planning and Preparation.....	13
Ethics Approval.....	13
Data Collection.....	13
Determining Food Security Status.....	14

Other Variables.....	16
Data Analysis.....	18
Results.....	20
Household Food Security Status.....	20
Household, Country Food and Additional Questions on Food Security.....	25
Food Security Status by Selected Characteristics.....	29
Discussion.....	31
Food Insecurity in Nunavut.....	31
Food Insecurity Among Adults and Children.....	32
Additional Food Security Questions.....	33
Food Insecurity and Selected Variables.....	33
Programs Addressing Access to Food.....	34
Limitations and Strengths.....	35
Food Insecurity Measure and Traditional Food.....	37
Conclusion.....	39
Implications for Public Health.....	40
Reference List.....	42
Appendices.....	48



## LIST OF TABLES

Table 1. Health Canada food security labels and specifications.....	15
Table 2. Household, adult and child food security status by household type among Inuit of the Kivalliq and Qikiqtaaluk regions in Nunavut 2007-2008 (n=1,022).....	21
Table 3. Frequency distribution of selected household and country food characteristics among Inuit of the Kivalliq and Qikiqtaaluk regions in Nunavut 2007-2008 (n=1,038).....	26
Table 4. Frequency of responses to additional food security items among Inuit of the Kivalliq and Qikiqtaaluk regions in Nunavut, 2007- 2008.....	28
Table 5. Prevalence of household food insecurity by selected household and country food characteristics among Inuit of the Kivalliq and Qikiqtaaluk regions in Nunavut, 2007-2008.....	30

## LIST OF FIGURES

Figure 1. Prevalence of household food insecurity, by household type.....	22
Figure 2. Prevalence of severe food insecurity, by household type.....	23
Figure 3. Prevalence of food insecurity, by region.....	24
Figure 4. Percentage of population in the Kivalliq (n=417) and Qikiqtaaluk (n=605) regions by food security status.....	24

## LIST OF APPENDICES

Appendix A. 18-item food security questionnaire.....	48
Appendix B. Household and country food questions.....	53
Appendix C. Additional food security questions.....	56
Appendix D. Responses to the 18-item food security scale for the Kivalliq and Qikiqtaaluk regions in Nunavut 2007-2008.....	58

## **BACKGROUND**

Inuit residing in the Canadian Arctic have been undergoing rapid environmental, economic, and socio-cultural changes for the past several decades affecting their traditional lifestyle and health (Kuhnlein & Receveur, 1996; Kuhnlein, Receveur, Soueida & Egeland, 2004; Schaefer, 1977; Waldram, Herring & Young, 2007; Young & Bjerregaard, 2008). The history of forced relocations by the federal government into permanent settlements, isolating geography, unique issues surrounding the cost and availability of nutritious food, harsh climate, and distinct political structures of Inuit regions, all play a part in health and the health care delivery in the remote regions of Canada (Waldram et al.; Young & Bjerregaard, 2008). As a result of these unique characteristics, chronic diseases such as diabetes and cardiovascular disease, which were historically rare among this population, are rising steadily among Inuit.

Traditionally reliant and sustained by relatively high-nutrient country food, current trends show an increased consumption of relatively low-nutrient store-bought food (Kuhnlein & Receveur, 1996; Kuhnlein et al., 2004; Waldram et al., 2007; Young, 1990). Generally, non-perishable food is lower in cost compared to more nutritious perishable food. A study by Nakano, Fediuk and Kuhnlein (2005) with the Dene, Métis and Yukon children, found that those who consumed traditional food had significantly more protein, iron, zinc, copper, magnesium, phosphorous, potassium, vitamin E, riboflavin and vitamin B6 than those who did not consume any traditional food. A low intake of these nutrients does not pose a

significant consequence to health in the short term; however chronic low intake can lead to long-term health problems (Tarasuk & Beaton, 1999). Similar findings have been observed with other northern Indigenous peoples showing that with decreased consumption of country food, the quality of the Indigenous diet is compromised (Kirkpatrick & Tarasuk, 2008; Kuhnlein & Receveur; 1996; Rose & Oliveira, 1997).

At present, Inuit continue to experience significant health inequalities in comparison to the general Canadian population. Inuit have lower life expectancy (64.5 years for Inuit males compared to 77.0 years for non-Inuit males, and 69.7 years for Inuit females compared to 82.0 years for non-Inuit females), higher rates of infant mortality, increases in infectious and chronic diseases, and higher rates of accidents and suicide (Waldram et al., 2007; Young & Bjerregaard, 2008). Despite the existing disparities, Inuit are a resilient people and they recognize that in order to improve their well-being the broader social determinants of health must be addressed. Social determinants which go beyond medical care and address the underlying economic and social conditions under which people live and which determine their health (National Aboriginal Health Organization, 2007).

Food security in particular has emerged as a significant health priority for the Inuit over the past decade as a result of its association with the increasing rates of diabetes and heart disease (Health Canada, 2005; Kuhnlein et al., 2004). With limited access to sufficient and affordable nutritious food, healthy eating is

difficult to achieve in northern Canada and increases the risk of poor health and disease (Che & Chen, 2001; Health Canada, 2007). Current statistics for Nunavut report a diabetes prevalence rate of 1.5% (Health Canada, 2005). Although the rate is lower than the 5.1% for the general Canadian population, it is believed that rate is increasing rapidly due to changes in diet and lifestyle as Inuit shift from a traditional hunting and fishing economy to a more Westernized lifestyle (Inuit Tapiirit Kanatami, 2007; Young & Bjerregaard, 2008).

### **Food Security**

Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (World Food Summit, 1996). Accepted world-wide and endorsed by the Canadian government, this definition emphasizes the multidimensional nature of food security, one that encompasses food access, food availability, food utilization and food stability. Hamm and Bellows (2003) take the definition further by defining community food security as a condition where all community residents obtain a safe, culturally acceptable, nutritionally adequate diet, through a sustainable food system that maximizes community self-reliance and social justice. Community food security encompasses a broader food system, one that goes beyond household and individual food insecurity.

To be food secure, individuals and households must be able to reliably access food via adequate income, and have access to a sufficient supply and

production of nutritious food at the community level (Lambden, Receveur, Marshall and Kuhnlein, 2006).

In Canada, Aboriginal peoples residing in the north suffer disproportionately from food insecurity compared to the rest of the national population. The results from the Canadian Community Health Survey (CCHS 1.1) conducted in 2000-2001 found that 56.0% of residents in Nunavut experienced food insecurity, 28.0% in the North West Territories, and 21.0% in the Yukon, compared to the national prevalence rate of approximately 14.7% (Ledrou & Gervais, 2005). The CCHS 2000/01 assessed food security using 3 indicator questions and is the only large-scale national study to date that has reported the prevalence of food insecurity in the Canadian north (Ledrou & Gervais). More recent national data on food insecurity comes from the CCHS 2.2 nutrition cycle conducted in 2004 and includes the complete set of the 18 food security questions however the survey excludes First Nations reserves or Crown Lands, the 3 territories and some remote areas in provinces (Health Canada, 2007). The CCHS 2.2 found that 33.0% of off-reserve Aboriginal households in Canada experienced food insecurity compared to about 9.2% for non-Aboriginal households (Health Canada). The survey is the first of its kind in Canada and provides data based on a sophisticated multiple-indicator survey tool that enables confident estimates of the prevalence of household food insecurity.

Studies conducted in a select number of small, isolated communities have reported very high levels of food insecurity (Lawn & Harvey, 2003; Lawn &

Harvey, 2004; Lawn & Harvey, 2004). Using a modified version of the Household Food Security Survey Module (Bickel, Nord, Price, Hamilton & Cook, 2000), Lawn and Harvey (2003; 2004; 2004) collected information as part of the Food Mail Pilot Project Baseline Surveys and found that 40% of households in Kangiqsujaq, Nunavik, 68% in Fort Severn, Ontario and 83% in Kugaaruk, Nunavut, experienced food insecurity. In addition to the food security data, the surveys provided insight into the barriers of purchasing perishable, healthy foods in remote regions of Canada. Using a comparison of after-shelter income of a two-parent family of four (with 2 children) living entirely on income support (social assistance) to the cost of the Northern Food Basket for a family of this size and type, found that in Kugaaruk, Nunavut the monthly cost of food was approximately 91% of their after-shelter income, 82% in Kangiqsujaq, Nunavik and 102% in Fort Severn, Ontario. These findings showed that a family of four in Kugaaruk, Nunavut had only about \$146 left for other basic needs after having purchased a food basket under the Food Mail program (a program designed to lower the cost of perishable, healthy food), and paying rent (Lawn & Harvey, 2003). The results from these studies demonstrated that Aboriginal peoples residing in remote areas of Canada had limited access to perishable, healthy store-bought food, and they experienced high rates of food insecurity. The findings reflect high cost of food and pervasive rates of poverty as experienced by northern communities (Willows, 2005).



## **Traditional / Country food**

Traditional or country food refers to wild-harvested food including land animals, birds, fish, sea mammals, berries and other plants (Kuhnlein & Receveur, 1996). Across northern Canada traditional food consumption constitutes approximately 17%-28% of total dietary energy with variability existing by gender, age and community (Kuhnlein et al., 2004). Women tend to derive less of their dietary energy from traditional food compared to men, and younger individuals have been found to consume less traditional food than their elders (Kuhnlein et al.; Receveur, Boulay and Kuhnlein, 1997). Geographical variation has also been found to be an important factor, with more southern Indigenous communities consuming a smaller portion of their dietary intake from traditional food sources (Nakano et al., 2005; Receveur et al., 1997). Variations in traditional food consumption reflect a culture in transition as traditional foods are being slowly displaced from the Indigenous diet.

The harvesting and consumption of country food represent unique considerations of food security for Inuit. Country food is more nutritious (lower in fat and more nutrient-dense) than store-bought food, and has economic, spiritual and cultural importance for Inuit (Power, 2008). To ensure food security among Inuit residing in northern Canada, it will be vital to consider both, the cost associated with harvesting traditional food, and the high cost associated with nutritious store-bought food.

## **Main Barriers to Food Security**

As Inuit continue to undergo changes in their lifestyle and cultural practices, diets that emphasize a diverse array of country food and nutritious store-bought food will be critical to support health. A number of barriers, however, interact to undermine a person's ability to eat a healthful diet in the north. Climate change is impacting migration of species and access to harvest areas as a result of water level changes (Furgal & Seguin, 2006; Guyot, Dickson, Paci, Furgal & Chan, 2006). A remote geography affects the number of available health professionals (Waldram et al., 2007; Young & Bjerregaard, 2008). High cost of hunting and fishing supplies limits access to more nutritious country food (Chan et al., 2006). High unemployment as a result of limited opportunities, contributes to lower income levels. And poor quality, high cost and an unreliable supply of nutritious perishable food affect the purchase of more fresh fruits and vegetables at local stores (Lawn & Harvey, 2003). Together, all of these issues interact to create some of the main barriers to food security in remote northern communities in Canada. A comprehensive understanding of the barriers to healthy eating and a deeper appreciation of their interactions are ultimately required to improve the diets and health of the indigenous peoples living in the Canadian north (Willows, 2005).

Food insecurity has been identified as a predisposing factor for poor nutrition, and poor physical and mental health (Stuff et al., 2004; Vozoris & Tarasuk, 2003). In Canada, those in food insecure households more often

reported their health as being either “fair” or “poor” and reported having more chronic health problems including heart disease, diabetes, high blood pressure and food allergies (Che & Chen, 2001). It has been well established that without proper access to nutritious and sufficient food, a person’s health and well-being is compromised (Stuff et al.; Vozoris & Tarasuk; Young & Bjerregaard, 2008).

### **Programs Addressing Food Security in the Canadian North**

Currently, two programs in Nunavut aim to address food insecurity among northern residents: Food Mail and the Nunavut Harvesters Support Program. The Food Mail was established by the Government of Canada in 1993 to address inadequate access and the high cost of perishable food in isolated northern communities. The program provides postal subsidies for perishable and non-perishable healthy food to approximately 140 eligible isolated northern communities. With the use of subsidies, the program promotes healthy eating in the north by offering nutritious, perishable foods at a reduced cost (Indian and Northern Affairs Canada, 2009).

The Nunavut Harvesters Support Program aims to address the high cost associated with traditional harvesting activities of hunting and fishing (Boult, 2004; Chan et al., 2006). The program provides funding support for equipment and its maintenance including snowmobiles, all-terrain vehicles, boats, rifles, fish nets and sewing machines. The program also supports community-based Hunters and Trappers Organizations (HTOs) which promote the preservation of traditional lifestyles by organizing community harvests, teaching survival skills

and harvesting knowledge (Boult; Nunavut Tunngavik Inc., n.d.). The program is recognized for its significant contribution to the promotion of traditional activities (Nunavut Tunngavik Inc.).

Country food continues to play an important role in the physical, social and cultural health of individuals and communities, and is a vital requisite of food security (Health Canada, 2001; Lambden, Receveur and Kuhnlein, 2007; Van Oostdam et al., 2005). The harvesting and consumption of local resources form the basis for social activity and community cohesion (Power, 2007). It is also a significant means of transmitting values, traditional skills and knowledge, and spirituality (Lambden et al.). Assessing food insecurity among the Inuit will therefore require the consideration of both, the market and country food systems (Lambden et al.; Power, 2008).

## **RATIONALE**

The United Nations Food and Agriculture Organization considers food insecurity a deprivation of a basic human right (Food and Agriculture Organization, 2002). The negative nutritional, psychological, social and cultural outcomes of food insecurity are far reaching and pose a serious threat to the health and well-being of Inuit (Che & Chen, 2001; Hamelin, Habicht & Beaudry, 1999; Hamelin, Beaudry & Habicht, 2002; Ledrou & Gervais, 2005; Tarasuk, 2001; Tarasuk & Beaton, 1999; Vozoris & Tarasuk, 2003). Aboriginal peoples living in northern Canada are highly vulnerable to food insecurity as a result of isolation, high levels of under-employment and unemployment, and low income all of which affect the purchase of perishable, healthy food from local stores and limit the purchase of equipment needed to maintain traditional activities of fishing, hunting, trapping and harvesting (Chan et al., 2006; Duhaime, Chabot & Gaudreault, 2002; Lambden et al., 2006; Lawn & Harvey, 2003).

Currently, limited data exist on the prevalence and extent of food insecurity among Inuit in Nunavut, as well as on the availability of and access to country food. As well, despite an increased dependence on store-bought food as a result of lifestyle changes, country food remains an important contributor to the diet quality of Inuit and is central to Inuit cultural and personal identity (Kuhnlein et al., 1996; Power, 2008). An accurate assessment of food insecurity in Nunavut should therefore reflect both the market food and country food systems (Power).

An Inuit Health Survey conducted across the Canadian Arctic in 2007 and 2008 will, for the first time, provide territory-wide information on food security within Inuit context by not only providing estimates of food insecurity but also providing comprehensive information on the availability, food sharing practices, and accessibility to country food. The analyses of food insecurity in Nunavut are the first step in characterizing food security relevant to Inuit. The information will undoubtedly provide the government of Nunavut with important evidence to help develop effective responses to mitigate the negative health impact of household food insufficiency, and help guide future policies and program interventions.

## **RESEARCH QUESTIONS**

The main goal of this research project was to evaluate food security among Inuit in Nunavut. This goal was achieved by the following aims:

1. To evaluate food security status of Inuit households in Nunavut using a modified version of the USDA methodology.
2. To describe access to and availability of traditional/country food.
3. To explore relationships between food insecurity and selected household and country food characteristics.

## **METHODS**

### **Study Area and Survey Sample**

A cross-sectional Inuit health survey “Qanuippitali? *How about us, how are we?*” was conducted across the Canadian Arctic on board the Canadian Coast Guard ship *Amundsen* in the summer and fall of 2007 and 2008. The aim of the survey was to collect vital health information on Inuit residing in Nunavut, the Inuvialuit Settlement Region and Nunatsiavut, Labrador, to help improve health care planning, personal health and community wellness. Analyses in this paper are based on data collected through interviewer-administered home-based questionnaires from 20 out of the 25 communities in Nunavut – 8 communities from the Kivalliq region, and 12 communities from the Qikiqtaaluk region (formerly Baffin).

The sample population for this survey included self-identified Inuit adults 18 years of age and older. Homes were randomly selected using community housing lists and the participation rate varied by region. In the Kivalliq region, 679 households were invited to participate and 69.5% participated. Of those that participated in the survey 420 completed the home-based questionnaire for the household, and of those 417 completed the food security section. In Baffin, 811 households were invited to participate and 79.8% participated. Of those that participated in the survey 618 filled out the home-based questionnaire for the household, and of those 605 completed the food security section. Food security score was based on the total of 1,022 households.

## **Research Planning and Preparation**

From the inception of the project the logistics, research and design of the questionnaires were guided by the Nunavut steering committee represented by the Nunavut Association of Municipalities, Government of Nunavut Department of Health and Social Services, Nunavut Tunngavik Inc. and University of Toronto as well as in full partnership with participating communities. Research agreements were negotiated with each community and randomly selected participants were first shown a short DVD consent – a visual representation of a consent form – before being asked to sign a written consent.

## **Ethics Approval**

Ethics approval for the proposed use of secondary data was obtained from the Review Ethics Board at Simon Fraser University in May 2008. In addition, a letter granting access to the use of secondary data has been obtained from the principal investigator of the Inuit Health Survey, Dr. Grace Egeland. Access to the health data by graduate students comply with the agreements signed with the Nunavut steering committee, the participating communities, and the original ethics approval obtained from the Review Ethics Board at McGill University.

## **Data Collection**

Data were collected in 18 communities in August-September of 2007 and in 2 additional communities in August-September of 2008, for a total of 20 communities representing the Kivalliq and Qikiqtaaluk regions in Nunavut.



Information on general household characteristics, food security and country food was collected through a home-based questionnaire. The home-based questionnaire was administered to a principal respondent of the household which was considered to be the person who usually buys most of the food in the home.

### **Determining Food Security Status**

Food security status was evaluated using an adapted version of the USDA Household Food Security Survey Module (Bickel et al., 2000). The survey module was comprised of 18 questions which refer to the food security situation in the household during the previous 12 months, ranging in severity from worrying about food running out, to adults or children not eating for a whole day (Appendix A). The module combined a 10-item Adult Food Security Scale that was specific to the experience of adults in the household or the household in general, and an 8-item Child Food Security Scale that was specific to the experiences of children under 18 years of age in the household.

Each response to the 18-item food security survey module was used to construct a 12-month food security scale. Scoring was based on the number of increasingly severe indications of food insecurity the household experienced, as indicated by affirmative responses to food insecure conditions presented in the module (Bickel et al., 2000). Affirmative responses were constructed from answers which indicated 'yes', 'often', 'sometimes', 'almost every month', or 'some months but not every month'. Negative responses were constructed from answers which indicated 'no', 'never', 'only 1 or 2 months', and 'not applicable'.

The 18-item scale was then used to classify households into 3 categories of food insecurity status according to the new classification method adopted by Health Canada (2007). The Health Canada categories differ from the current U.S. standard method by considering food insecure households based on two or more affirmative responses on either the 10-item adult scale or 8-item child scale on the household food security survey module. In contrast, the U.S. classifies food insecure households based on three or more affirmative responses (Bickel et al., 2000). The Health Canada methodology lowered the threshold to better capture the degree of food insecurity at the household level. The 3 categories include *food secure*, *food insecure moderate* and *food insecure severe* (Table 1).

Table 1. Health Canada food security labels and specifications

Health Canada Category Labels	Health Canada Category Specifications		
	10-Item Adult Scale (and Household Scale for Households with no Children)	8-Item Child Scale	Household Food Security Status for Households with Children
<b>Food Secure</b>	0-1 affirmative responses	0-1 affirmative responses	Both adults and children food secure
<b>Food Insecure, Moderate</b>	2-5 affirmative responses	2-4 affirmative responses	Either adults or children (or both) food insecure, neither severely food insecure
<b>Food Insecure, Severe</b>	≥ 6 affirmative responses	≥ 5 affirmative responses	Either adults or children (or both) severely food insecure

Following the guidelines of Health Canada (2007), the adult food security status in households without children, was equal to household food security status. In households with children, both the adult and child scales were considered in determining the food security status of the household. If both adults and children in the household were food secure, the household was considered food secure. If either adults or children, or both adults and children, in the household were moderately food insecure, and neither was severely food insecure, the household was considered moderately food insecure, and if either adults or children in the household were severely food insecure, the household was considered severely food insecure (Table 1).

### **Other Variables**

Frequency tabulations are reported for selected household, country food (CF) and additional questions on food security. The original questions on household and country food characteristics, on which the following descriptions of variables are based, are included in Appendix B. Descriptions of the variables used for analyses are as follows. The responses to the question “Is your home (choose one of the following)?” were collapsed from a total of seven responses into three: ‘public’, ‘private’ and ‘other’ to create the ‘type of dwelling’ category. The ‘other’ category comprised responses 3, 4, 5, ‘don’t know’ and ‘no response’.

The responses to the question “In the past month, did anyone in your household receive income support?” were kept in their original form by classifying households into either a ‘yes’ or ‘no’ category.

Responses to the question “Does your home have a problem with mould or is in need of major repairs?” were collapsed by combining responses ‘mould’, ‘major repairs’ and ‘both above’ into the ‘problems with mould/repairs’ category, and ‘neither’ into the ‘no problems’ category, to form the variable ‘home repairs’.

All of the questions from the country food section were tabulated except for questions related to the most and least abundant country food in the last 12 months. The following country food variables: ‘active hunter in household’, ‘distribute CF’, ‘food preference’, ‘would prefer to eat more CF than can get’, ‘comparing cost of food’, and ‘actions taken when household runs out of CF’ were used without any modification.

The responses to the question, “Are you worried about the contaminants in the country food that you and your family eat?” such as ‘yes’ and ‘somewhat’ were collapsed into the ‘yes’ response to form the ‘worried about contaminants in CF’ variable. The nine responses to the question “If you (and your household) cannot get country food, can you tell me why?” were collapsed into six responses. The ‘no hunter’ response included responses such as ‘no active hunter in the household’ and ‘active hunter in household is sick or away’; the ‘lack of supplies’ category included ‘no skidoo’, ‘no boat’, ‘skidoo broken’ and ‘boat broken’, the ‘not applicable’ category included responses such as ‘no problem getting country food’ and ‘country food abundant in home’, and formed the variable ‘reasons for not being able to get CF’.

Additional questions on food security were included in this paper to attempt to capture the reasons behind food insecurity and actions taken by food insecure households when they were unable to afford enough food (Appendix C). No modifications were made to the two questions related to children under-18 years of age. The responses to the question, “I would like to ask you about why your household was unable to afford enough food. Can you tell me the main reason?” were slightly modified: ‘not working’ and ‘not enough income’ were collapsed into a single response, as were ‘don’t know’ and ‘no response’. The remaining answers were left in their original form. For the question, “when your household is unable to afford enough food, what do you do?” responses ‘borrow money for food from friends or family’ and ‘go over to or ask for food from family or friends’ were collapsed into a single response called ‘depend on family or friends’. ‘Don’t know’ and ‘no response’ were combined into a single response. Only those households that answered affirmatively to any of the food insecurity questions numbered 6 to 18 were asked the additional questions on food insecurity as a result of a built-in skip pattern within the questionnaire.

### **Data Analysis**

The analyses in this paper are restricted to a few selected variables from the home-based questionnaire and lack certain demographic variables such as age, sex and marital status. For the purposes of this paper, the home-based questionnaire provided sufficient information to address the study’s research questions. Cross-tabulations were used to estimate the percentage of people

living in food insecure households and the prevalence of selected household and country food characteristics. Chi-square statistics were calculated to test for the statistical significance between food insecurity and selected household and country food variables. A  $p$ -value of  $<0.05$  was considered statistically significant. Most statistical analyses were conducted using STATA 10. Ninety-five percent confidence intervals for proportions were calculated using the normal approximation as outlined by Fleiss (1981). Prevalence ratios were calculated using the Simple Interactive Statistical Analysis (1997) program available online.

## RESULTS

Descriptive analyses were performed to determine the prevalence of adult, child and household food security and insecurity, and to provide key findings on selected household, country food and additional questions related to food security among Inuit of the Kivalliq and Qikiqtaaluk regions in Nunavut. Additional analyses were undertaken by selected household and country food variables in an attempt to identify those households in which food insecurity was more prevalent. The data presented in this paper are preliminary in nature as household survey weights at the time of analysis were unavailable.

### **Household Food Security Status**

Individual responses to the 18-item food security scale are presented in Appendix D. Answers reflect the percentage of households that responded affirmatively to each of the food security questions. Affirmative responses comprised answers such as 'often', 'sometimes', 'yes', 'almost every month' or 'some months but not every month'. Generally, as questions increased in severity, the number of households responding affirmatively decreased.

In 2007-2008, 70.5% of Inuit households, in the Kivalliq and Qikiqtaaluk regions of Nunavut, were moderately or severely food insecure (Table 2). The overall prevalence of food insecurity was higher among households with children compared to households without children (PR=1.15, 95% CI: 1.03, 1.29, p=0.0056) (Figure 1).

Table 2. Household, adult and child food security status by household type among Inuit of the Kivalliq and Qikiqtaaluk regions in Nunavut 2007-2008 (n=1,022)

HOUSEHOLD TYPE	n	%	95% CI <sup>4</sup>
<b>All households<sup>3</sup></b>			
HOUSEHOLD Status <sup>1</sup>	<b>1022</b>		
Food secure	302	29.5	26.8-32.5
Food insecure, moderate	329	32.2	29.4-35.7
Food insecure, severe	391	38.3	35.3-41.3
<b>Food insecure, Total</b>	<b>720</b>	<b>70.5</b>	<b>67.5-73.2</b>
ADULT Status <sup>1</sup>	<b>1022</b>		
Food secure	312	30.5	27.7-33.5
Food insecure, moderate	344	33.7	30.8-36.7
Food insecure, severe	366	35.8	32.9-38.8
<b>Food insecure, Total</b>	<b>710</b>	<b>69.5</b>	<b>66.5-72.3</b>
<b>Households with Children</b>			
HOUSEHOLD Status <sup>1</sup>	<b>807</b>		
Food secure	222	27.5	24.5-30.8
Food insecure, moderate	251	31.1	27.9-34.4
Food insecure, severe	334	41.4	38.0-44.9
<b>Food insecure, Total</b>	<b>585</b>	<b>72.5</b>	<b>69.2-75.5</b>
ADULT Status <sup>1</sup>	<b>807</b>		
Food secure	232	28.7	25.7-32.0
Food insecure, moderate	266	33.0	29.7-36.3
Food insecure, severe	309	38.3	34.9-41.8
<b>Food insecure, Total</b>	<b>575</b>	<b>71.3</b>	<b>68.0-74.3</b>
CHILD Status <sup>2</sup>	<b>807</b>		
Food secure	333	41.2	37.9-44.8
Food insecure, moderate	250	31.0	27.8-34.3
Food insecure, severe	224	27.8	24.7-31.0
<b>Food insecure, Total</b>	<b>474</b>	<b>58.8</b>	<b>55.2-62.1</b>
<b>Households without Children</b>			
HOUSEHOLD Status <sup>1</sup>	<b>215</b>		
Food secure	80	37.2	30.8-44.1
Food insecure, moderate	78	36.3	29.9-43.1
Food insecure, severe	57	26.5	20.8-33.0
<b>Food insecure, Total</b>	<b>135</b>	<b>62.8</b>	<b>55.9-69.2</b>

<sup>1</sup> Results based on 10-item adult/household food security scale.

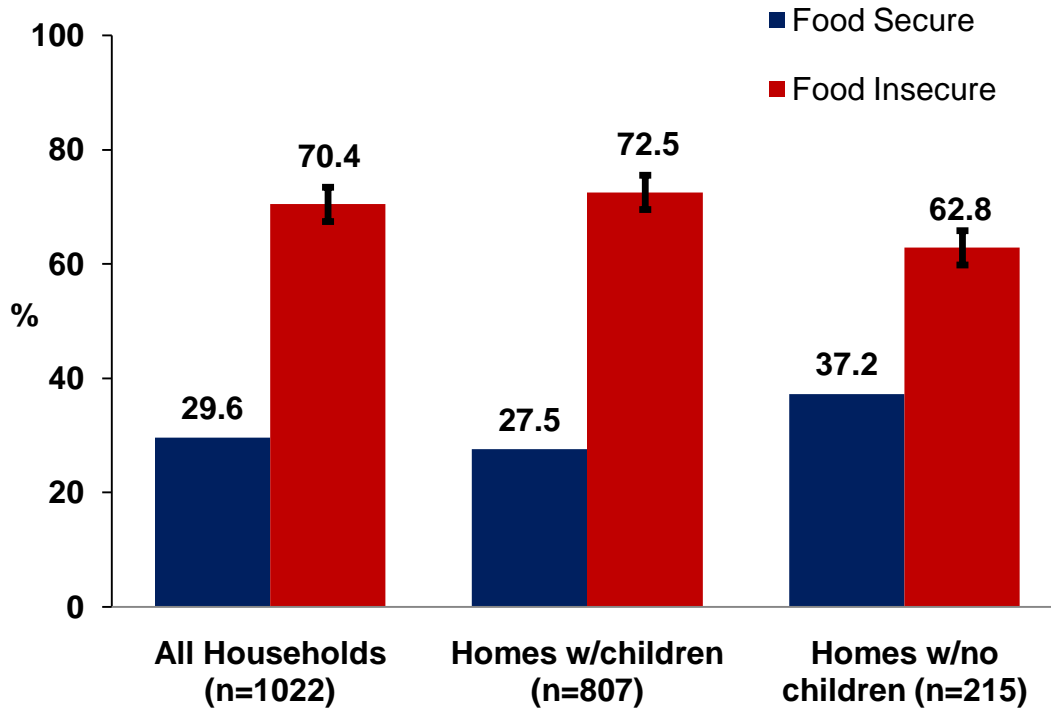
<sup>2</sup> Results based on 8-item child food security scale.

<sup>3</sup> Food security status defined in the methods section.

<sup>4</sup> Confidence interval.



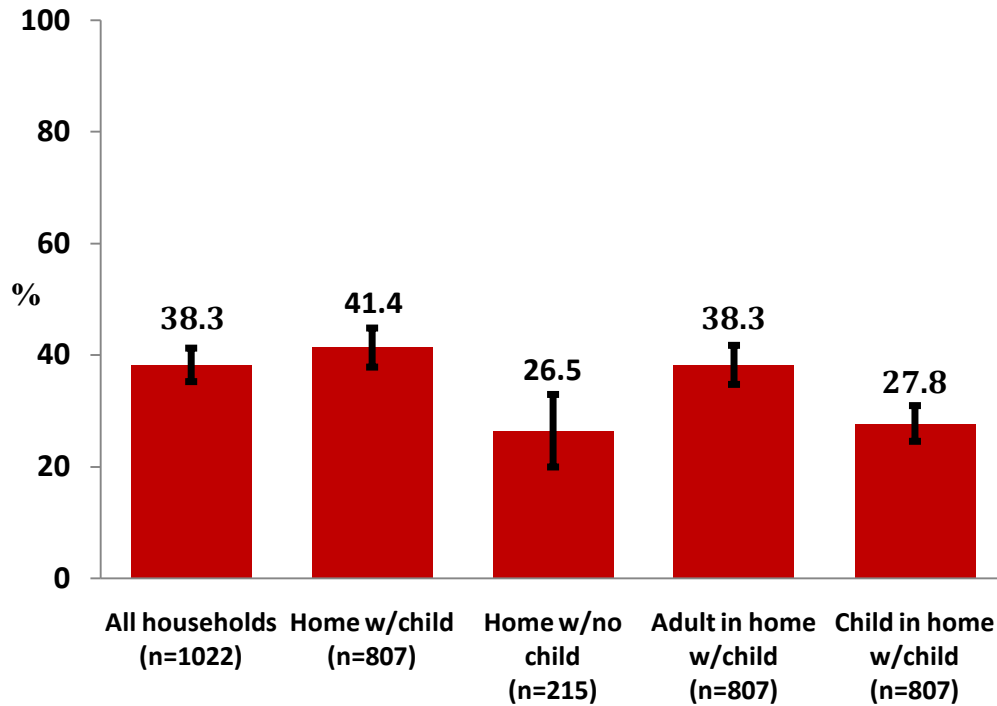
Figure 1. Prevalence of household food insecurity, by household type



The 10-item adult food security scale revealed that in households with children, 71.3% of adults were food insecure compared to 62.8% for adults in households without children (PR=1.13, 95% CI: 1.01, 1.27,  $p=0.0166$ ) (Table 2). The 8-item child food security scale showed that 58.8% of children experienced food insecurity. Within households with children, the overall prevalence of food insecurity was 1.21 (95% CI: 1.13, 1.30,  $p<0.0001$ ) times higher among adults than among children living in that same household. A higher prevalence of severe food insecurity was found among households with children (41.4%) compared to those without (26.5%) (PR=1.44, 95% CI: 1.17, 1.79,  $p<0.0001$ ) (Figure 2). Within households with children, the prevalence of severe food

insecurity was 1.42 (95% CI: 1.25, 1.61,  $p=0.0000$ ) times higher among adults compared to children living in that same household (Figure 2).

Figure 2. Prevalence of severe food insecurity, by household type



At the regional level, approximately 77% of Inuit households in the Kivalliq region ( $n=417$ ) versus 66% in the Qikiqtaaluk region ( $n=605$ ) experienced food insecurity (PR=1.16, 95% CI: 1.08-1.26,  $p<0.001$ ) (Figure 3). The prevalence of severe food insecurity was 1.32 (95% CI: 1.16, 1.50,  $p<0.001$ ) times higher among Inuit households in the Kivalliq than in the Qikiqtaaluk region, 44.4% and 34.1%, respectively (Figure 4).

Figure 3. Prevalence of food insecurity, by region

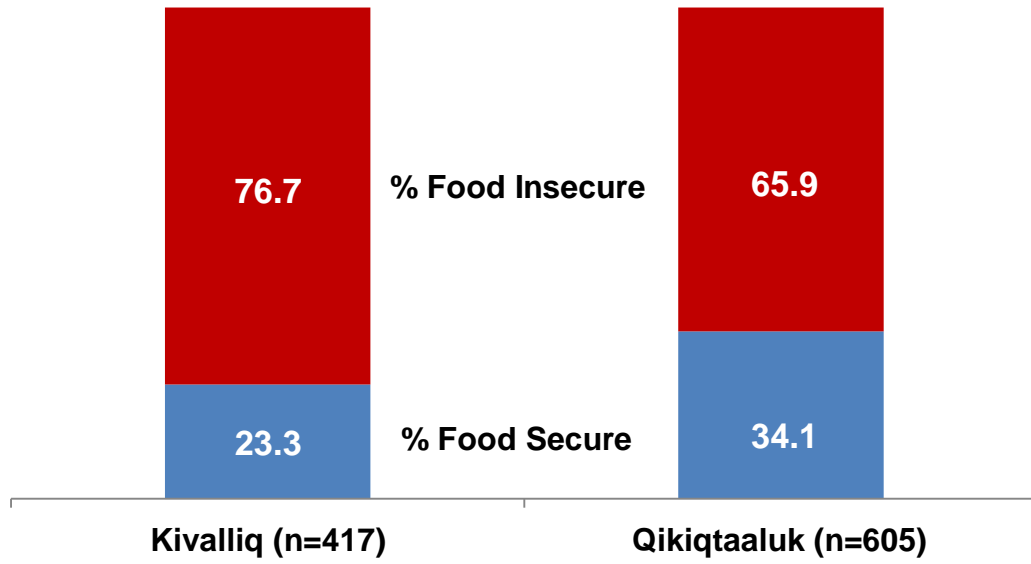
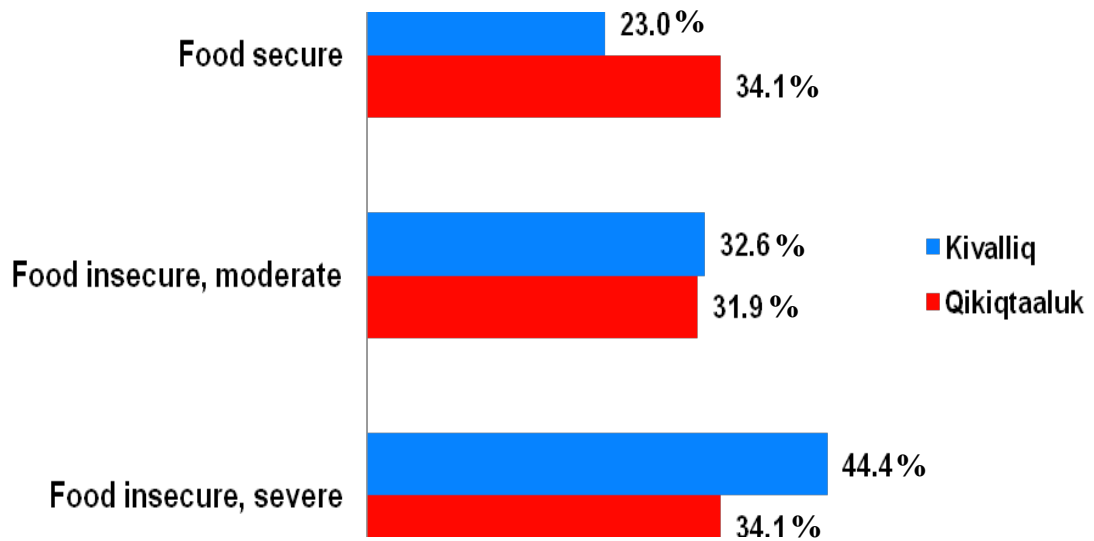


Figure 4. Percentage of population in the Kivalliq (n=417) and Qikiqtaaluk (n=605) regions by food security status



## **Household, Country Food and Additional Questions on Food Security**

General household characteristics showed that over half of Inuit homes had at least one individual on income support (51.6%), the majority resided in public (or subsidized) housing (76.5%), and almost half (46.2%) of homes had problems with mould and/or were in need of major repairs (Table 3). Responses related to country food revealed that approximately 65% of households had an active hunter in the household, 74% of households distributed country food to others in the community, 78% preferred to eat a mix of both store-bought and country food, 79% would prefer to eat more country food than they can get, and 76% found country food cheaper compared to the cost of market food. A low proportion of individuals, approximately 11%, obtained their food from community freezers and/or Hunters & Trappers organization and even fewer, 1%, used these community initiatives to acquire country food when their household ran out of country food (Table 3).

Some of the main reasons cited by households for not being able to acquire country food were a lack of a hunter in the household (approximately 38%), not having enough money for harvesting activities (21%), and lack of supplies for hunting and/or fishing (21%). Some of the main actions taken by the household when it ran out of country food were to ask family members or friends (approximately 54%), buy more market food (22%), hunt or fish (11%) or simply do without (11%).

Table 3. Frequency distribution of selected household and country food characteristics among Inuit of the Kivalliq and Qikiqtaaluk regions in Nunavut 2007-2008 (n=1,038)

	n <sup>1</sup>	%
<b>Household characteristics</b>		
<b>Income support</b>	<b>1,026</b>	
Yes	529	51.6
No	497	48.4
<b>Type of dwelling</b>	<b>1,036</b>	
Public	792	76.5
Private	187	18.1
Other	57	5.5
<b>Home repairs</b>	<b>979</b>	
Problems with mould/repairs	452	46.2
No problems	527	53.8
<b>Country food (CF) characteristics</b>		
<b>Active hunter in household</b>	<b>1,028</b>	
Yes	663	64.5
No	365	35.5
<b>Distribute CF</b>	<b>1,009</b>	
Yes	749	74.2
No	260	25.8
<b>Food preference</b>	<b>1,035</b>	
Country food	196	18.9
Store food	37	3.6
Mix of both	802	77.5
<b>Would prefer to eat more CF than can get</b>	<b>1,030</b>	
Yes	814	79.0
No	84	8.2
Neutral	132	12.8
<b>Comparing cost of food</b>	<b>939</b>	
CF is cheaper	714	76.1
CF is just as costly	128	13.6
CF is more expensive	97	10.3
<b>Worried about contaminants in CF</b>	<b>999</b>	
Yes	493	49.4
No	506	50.6

	n	%
<b>Country food (CF) characteristics (cont'd)</b>		
<b>In last 12 mo. CF obtained by:</b>	<b>1,033<sup>2</sup></b>	<b>%<sup>2</sup></b>
Family	756	73.2
Hunting	629	61.0
Friends	418	40.5
Stores	126	12.2
Community freezer/Hunters & Trappers	114	11.0
No country food acquired	9	0.9
Not interested in CF	9	0.9
<b>Reasons for not being able to get CF<sup>3</sup></b>	<b>814</b>	
No hunter	308	37.8
Not enough money	174	21.4
Lack of supplies	170	20.9
CF not abundant	61	7.5
CF not important	15	1.8
Not applicable	86	10.6
<b>Actions taken when household runs out of CF<sup>3</sup></b>	<b>939</b>	
Ask family or friends	505	53.8
Buy more market food	203	21.6
Hunt or fish	106	11.3
Do without	106	11.3
Community Freezer/Hunters & Trappers	10	1.1
Not applicable	9	0.9

<sup>1</sup> Missing/don't know/no response responses are not included.

<sup>2</sup> The number of responses and percents do not add up as households could choose more than one response.

<sup>3</sup> Answers represent the number one reason or action taken by the household.

Information collected through additional food security items provided further understanding behind the reasons why a household was unable to afford enough food (Table 4). These questions were answered only by those households which answered affirmatively to any of the food security questions from 6 to 18 (see Appendix A). The three main reasons reported by households for not being able to afford enough food were not working/not enough income (approximately 60%), waiting for income support (10%) or had to pay bills (9%).

Table 4. Frequency of responses to additional food security items among Inuit of the Kivalliq and Qikiqtaaluk regions in Nunavut, 2007-2008<sup>1</sup>

Additional Food Security Items	# Responses %
<b>Reasons why a household was unable to afford enough food</b>	<b>436<sup>2</sup></b>
• Not working / not enough income	60.3
• Waiting for income support	9.8
• Had to pay bills	8.7
• Food costs too much	6.2
• Other	5.1
• Gave food to others in the community	1.8
• Had to buy hunting, fishing or trapping equipment, supplies or gas	1.4
• Waiting for employment insurance	1.2
• Gave money away	1.2
• Spent money on cigarettes, gambling, drugs, alcohol	1.1
• Don't know or no response	3.2
<b>Actions taken when a household was unable to afford enough food</b>	<b>444<sup>2</sup></b>
• Depend on family or friends	55.6
• Ask store manager for more credit	8.8
• Do without	8.8
• Make an item to sell	7.9
• Ask for more income support	6.3
• Go hunting or fishing	4.9
• Other	3.6
• Ask help from CHR, nurse or doctor	0.5
• Food bank	0.5
• Community freezer/Hunters & Trappers Organization	0.2
• Don't know or no response	2.9
<b>Participation in a food program for children &lt;5 years</b>	<b>219</b>
• Participated in food program	46.1
• Did not participate in food program	51.1
• Don't know or no response	2.8
<b>Participation in a food program for children 6 – 17 years</b>	<b>307</b>
• Participated in food program	61.9
• Didn't participate in food program	32.2
• Don't know or no response	5.9

<sup>1</sup> The following questions do not contribute to the food security score. Questions answered only by those participants who answered any of the questions from fsc\_q6 to q18.

<sup>2</sup> Responses reflect the number one reason or action taken by the household.

The three main actions taken by a household when it was unable to afford enough food were to depend on family or friends (approximately 56%), ask store manager for more credit (9%) or simply do without (9%). Two additional questions related to children under 18 years of age showed that for children under the age of five, approximately 51% received breakfast, lunch or snacks at a day care, a pre-school program or kindergarten. For children between the age of six and seventeen, approximately 62% received breakfast, lunch or snacks at their school.

### **Food Security Status by Selected Characteristics**

Initial exploration of the relationship between food insecurity status and some of the household and country food characteristics showed significant associations ( $p < 0.05$ ) (Table 5). Food insecurity was more prevalent in households in which one or more adults received income support (82.5%,  $PR = 1.42$ , 95% CI: 1.31, 1.55,  $p < 0.0001$ ), those which resided in public (subsidized) housing (77.5%,  $PR = 1.59$ , 95% CI: 1.39, 1.82,  $p < 0.0001$ ), households that reported no active hunter (74.9%,  $PR = 1.10$ , 95% CI: 1.02, 1.20,  $p < 0.019$ ) and those households which worried about the presence of contaminants in country food (76.7%,  $PR = 1.19$ , 95% CI: 1.10, 1.30,  $p < 0.0001$ ).

The main reasons reported by food insecure households for not being able to get country food were not having enough money, lack of supplies for hunting, fishing or trapping, and a lack of hunter in the household, 87.2%, 81.5% and 76.1% respectively. Some of the main actions taken by food insecure



households when they ran out of country food were to do without (82.2%), ask family or friends (74.2%) and buy more market food (73.7%) (Table 5).

Table 5. Prevalence of household food insecurity by selected household and country food characteristics among Inuit of the Kivalliq and Qikiqtaaluk regions in Nunavut, 2007-2008<sup>1</sup>

Characteristic	N	% Food Insecure	PR (95% CI) <sup>3</sup>	P value
<b>Income support</b>	<b>1011</b>			
No		58.0	1.0	0.0001
Yes		82.5	1.42 (1.31-1.55)	
<b>Type of dwelling</b>	<b>1012</b>			
Private/Government		48.7	1.0	0.0001
Public		77.5	1.59 (1.39-1.82)	
<b>Active hunter in household</b>	<b>1013</b>			
Yes		67.9	1.0	0.019
No		74.9	1.10 (1.02-1.20)	
<b>Worried about contaminants in CF</b>	<b>985</b>			
No		64.3	1.0	0.0001
Yes		76.7	1.19 (1.10-1.30)	
<b>Reasons for not being able to get CF</b>	<b>802</b>			
Not enough money		87.2		
Lack of supplies		81.5		
No hunter		76.1	NA <sup>2</sup>	NA <sup>2</sup>
CF not important		73.3		
CF not abundant		55.0		
Other		62.8		
<b>Actions taken when household runs out of CF</b>	<b>925</b>			
Do without		82.2		
Ask family or friends		74.2		
Buy more market food		73.7	NA <sup>2</sup>	NA <sup>2</sup>
Hunt or fish		65.1		
Community Freezer/Hunters & Trappers		40.0		
Other		66.6		

<sup>1</sup> Chi-square test used to test for trends in food insecure households.

<sup>2</sup> Not applicable, categories are not mutually exclusive.

<sup>3</sup> Abbreviations: PR, prevalence ratio; CI, confidence interval

## **DISCUSSION**

The Inuit Health Survey 2007-2008 was the most comprehensive survey conducted in the Canadian Arctic to date, and the results presented in this paper provide data currently lacking for Nunavut. This analysis was undertaken to evaluate the extent of food insecurity among Inuit in Nunavut, to report on some key household and country food characteristics and to explore relationships between food insecurity and selected household and country food variables.

### **Food Insecurity in Nunavut**

High levels of food insecurity among Indigenous peoples in Canada have been previously reported in a number of northern communities (Health Canada, 2005; Lawn & Harvey, 2003; Lawn & Harvey, 2004; Lawn & Harvey, 2004; Ledrou & Gervais, 2005); however little was known about the rates of food insecurity at the territorial level as Inuit have generally been excluded from national health surveys (Power, 2007). Preliminary results from this study indicated a high level (70.5%) of household food insecurity among the Inuit of the Kivalliq and Qikiqtaaluk regions in Nunavut. This rate is approximately seven times higher than the Canadian national average of just 9.2 percent (Health Canada, 2007). Considering the established relationship between food insecurity and poorer health outcomes (Che & Chen, 2001; Stuff et al., 2004; Vozoris & Tarasuk, 2003), the high percentage of food insecure households in Nunavut calls for immediate policy action.

Study findings also demonstrated that households with children experienced significantly higher rates of food insecurity and severe food insecurity in the previous 12 months, compared to households with no children. Severe food insecurity is a condition characterized by reduced intake of food and disrupted eating patterns among adults and/or children in the household (Health Canada, 2007). Taking into consideration the higher cost of market food as well as limited access to and higher cost associated with harvesting country food, it is no surprise that households with children have a harder time accessing an adequate amount of, and the ability to afford nutritious food.

### **Food Insecurity Among Adults and Children**

The food insecurity measure was considered separately for adults and children in the household. Studies have demonstrated that there is a progression in the food insecurity experience where adults will sacrifice their intake in order to attenuate the effects on children (Health Canada, 2007; Lawn & Harvey, 2003; Lawn & Harvey, 2004; Lawn & Harvey, 2004). In studies with Aboriginal peoples in northern Canada, the prevalence and severity of food insecurity among children was similar to that among adults (Lawn & Harvey; Lawn & Harvey; Lawn & Harvey). In contrast, findings from the current study showed that 58.8% of children were deemed food insecure compared to 70.5% of all the adults and compared to 62.8% of the adult-only households, suggesting that children were being protected. This suggests that the adults in households with children were foregoing meals for the sake of their children.

## **Additional Food Security Questions**

Information collected through additional food security questions revealed that being unemployed and not having enough income were the main reasons cited by participants for why a household was unable to afford enough food. This finding is consistent with numerous studies which have cited lack of employment and limited or lack of income as the main barriers to food security (Chan et al., 2006; Che & Chen, 2001; Health Canada, 2007; Ledrou & Gervais, 2005). For Inuit, a limited or lack of sufficient income also affects access to country food. Today, traditional activities require the purchase of gas, ammunition and other supplies necessary for harvesting activities (Chan et al., 2006). Our findings revealed that 73.2% of households in the previous 12 months obtained country food from family when they were unable to get it themselves. And the main action taken by a household when it ran out of country food was to ask family or friends (53.8%). Dependence on social support networks appears to play an important role in filling the gap between household's economic constraint and accessibility to country food.

## **Food Insecurity and Selected Variables**

Initial exploration of the relationship between food insecurity and selected household and country food variables showed significant associations. We found that for households with individuals on income support (PR=1.42), those which resided in public housing (PR=1.59), households which lacked an active hunter (1.10) and individuals that worried about the contaminants in country food

(PR=1.19) had a higher prevalence of food insecurity. Variables such as being on income support and not owning your own dwelling have been repeatedly associated with increased odds of food insecurity (Vozoris & Tarasuk, 2003; Health Canada, 2007). Country food variables associated with higher odds of being food insecure will need to be considered in future policy planning at the territorial level.

### **Programs Addressing Access to Food**

The Hunters and Trappers Organizations (HTOs) along with community freezers are examples of some initiatives that aim to address the high cost of sustaining traditional harvesting lifestyles in the north (Boult, 2004; Chan et al., 2006). The locally run HTOs support activities which include organization of community harvests, teaching of survival skills, harvesting knowledge and traditional sewing techniques, all of which contribute to the preservation of a traditional lifestyle (Boult, 2004). Data from the current survey suggest that very few of the participants relied on these initiatives for country food or when the household was unable to afford enough food. Unfortunately, these initiatives were not available in every community and therefore it is difficult to draw any conclusions at this time. Interestingly, a study by Chan et al. (2006) revealed that insufficient funding may be attenuating the program's objectives thereby contributing to the current under-use of these resources by Inuit.

While HTOs aim to increase access to and promotion of country food among Inuit, the Food Mail program aims to provide access to affordable and

nutritious perishable and non-perishable market food to northern isolated communities. Our survey did not include specific questions related to this program; however given the high food insecurity in Nunavut, the Food Mail program may not be reaching those most in need of the subsidies – households with individuals on income support. Price surveys conducted between 2006 and 2008, as part of the Revised Northern Food Basket, revealed that in most isolated communities, the basket which would provide a nutritious diet for a family of four for one week cost between \$360 and \$450 (Indian and Northern Affairs Canada, 2008). Using the total after-shelter income of \$1,562.34 for a family of four as calculated for the Kugaaruk Food Mail pilot study (Lawn & Harvey, 2003), very little money is left over for other necessities.

### **Limitations and Strengths**

The Inuit Health Survey provided a unique opportunity to better understand income-related food insecurity in Nunavut, and provided additional information on unique aspects related to availability of and access to country food by Inuit. However, some limitations exist.

The Centre for Indigenous Peoples' Nutrition and Environment at McGill University in Montréal, currently house the original data and are in the process of developing weighted values based on the total number of Inuit households per community; therefore, all analyses in this paper are unweighted and preliminary.

The validated instrument of the United States Department of Agriculture (USDA) Household Food Security Survey Module (Bickel et al., 2000), is widely recognized as the best available instrument for assessing household-level food insecurity in the context of financial resource constraints (Tarasuk, 2001). This instrument was adapted for use by Lawn & Harvey (2003) and the 2004 Canadian Community Health Survey (Health Canada, 2007). The module does have certain limitations. For instance, the module does not capture the frequency or duration of food insecurity over time, nor does it provide an understanding of the experience of individuals within the household. The most notable limitation of the module when applied to Aboriginal peoples is its emphasis on market food accessibility. Country food remains a significant contributor to the indigenous diet, and initial results indicated that some country food characteristics were associated with food insecurity. Findings showed that food insecurity was significantly associated with having no active hunter in the household and with worrying about contaminants in country food. Questions related to country food should be incorporated into future monitoring measures within this population to better reflect the food situation relevant to Inuit.

Another important limitation is the fact that food security was measured at a single point in time and asked participants to recall food insecurity situation over the previous 12 months. With all self-report data, especially data requiring recall over an extended period, there is the potential for recall bias. Additionally, a single measure in time is likely to underestimate food insecurity among households. The survey also does not address the dynamics of food insecurity

as experienced by households on a daily/weekly/monthly basis. In addition, a cross sectional design makes it difficult to establish what is cause and what is effect until the food situation in Nunavut is monitored regularly (Creswell, 2003).

Despite the limitations, the Inuit Health Survey provides the government of Nunavut with baseline health data that are currently lacking for the territory, to make informed decisions about future policies and programs addressing food insecurity. Together with information on country food characteristics, the data provide the most comprehensive food security information to date for Nunavut.

### **Food Insecurity Measure and Traditional Food**

The high food insecurity in Canada's north is alarming but not unexpected. Results from earlier studies along with current survey findings all point to the fact that the majority of Inuit experience some level of food insecurity. It will be imperative for governments to act now to reduce the level of food insecurity which undermine Inuit health. Traditional food sources remain an important contributor to the Indigenous diet but are often over looked as a condition of food security for Aboriginal peoples (Lambden et al., 2006; Lambden et al., 2007; Lawn & Harvey, 2003; Lawn & Harvey, 2004; Lawn & Harvey, 2004). Current understanding of food insecurity has largely been developed from a non-indigenous context (Power, 2008). Further consideration may be required to reframe some of the questions of the Household Food Security Survey Module (Health Canada, 2007) for relevancy to Inuit. As well, future monitoring activities will need to consider both the market food system and the country food system to



truly capture food insecurity among this population. Our data showed that nearly three out of four Inuit relied on family to obtain country food over the previous 12 months and 61.0% relied on hunting for their country food. Improving current programs or creating new ones that will continue to support and encourage sharing practices while increasing access to country food, may be a good starting point for addressing current levels of food insecurity in Nunavut.

## CONCLUSION

Current analyses revealed that a large majority of Inuit households, 70.5%, were food insecure and that country food remained an important aspect of Inuit culture and food preference. Facing many unique challenges such as isolating geography, effects of climate change, a high cost of food, reduced access to healthy foods and decreased availability of a variety of foods, Inuit are undergoing a nutritional transition that is undermining their health and cultural identity. The rising rates of obesity, diabetes and cardiovascular disease among this population, as a result of rapid cultural changes (Kuhnlein et al., 2004; Waldram et al., 2007), will require an understanding of contemporary food insecurity relevant to Inuit (Willows, 2005).

The research findings from the Inuit Health Survey add to our understanding of food insecurity among Inuit in Nunavut, and of some factors associated with this vulnerability. However, quantifying differences between age groups, gender, and communities may reveal additional patterns among this population (Lambden et al., 2006; Lambden et al., 2007; Lawn & Harvey, 2001; Lawn & Harvey, 2003; Lawn & Harvey, 2004; Lawn & Harvey, 2004; Power, 2007).

Inuit-specific data will undoubtedly provide Nunavut with the evidence it needs to guide future interventions to reduce health inequities and improve the well-being of Inuit. Existing programs and policies have been met with mixed success in alleviating food insecurity in Nunavut (Chan et al., 2006; Lawn &

Harvey, 2001). The information collected through this survey not only provides baseline data which were lacking for Nunavut but also presents a unique opportunity to develop monitoring activities relevant for the territory.

### **Implications for Public Health**

Food security is an important determinant of health and one of the key elements of population health – an approach that seeks to reduce health inequities among population groups and ensure social justice (Dunn & Hayes, 1999). Food security is also a multifaceted and complex issue, one that will require an integrated framework of social, economic, cultural, spiritual and environmental spheres, and involvement of a variety of stakeholders. Current analyses reveal startling statistics for the territory and point to the need for establishing a monitoring system – one that will take into account current validated measures alongside characteristics relevant to Inuit.

Monitoring food security indicators relevant to Nunavut will contribute to a stronger understanding of the dynamic relationship between household food security and the underlying social and economic conditions under which the Inuit live. On-going monitoring of such data at regular intervals will be essential to future policy and program evaluation and development for the territory. Developing a measure instrument that finds a balance between the current validated measures, such as the widely used USDA Household Food Security Survey Module, alongside specifically designed questions relevant to Inuit would be advantageous.

In addition to developing a monitoring system of household food insecurity, it would be advantageous for the Government of Nunavut to concurrently monitor the cost of food in the north. Considering that approximately half of Inuit rely on income support, and the high cost of food in northern Canada, there appears to be a disconnect between the amount of money available to households per month and the affordability of nutritious and adequate food. Future policy will therefore require action on other determinants of health such as poverty and inequality in addition to food insecurity, to ensure a healthy Inuit population.

The data collected through the Inuit Health Survey will for the first time provide Nunavut with comprehensive information to help jumpstart and guide future initiatives in alleviating the negative health impacts of household food insecurity. Action must be taken now to safeguard the health of Inuit in Nunavut.

## REFERENCE LIST

- Bickel, G., Nord, M., Price, C., Hamilton, W., & Cook, J. (2000). *Guide to measuring household food security*. United States Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition and Evaluation. Alexandria, Virginia.
- Boult, D.A. (2004). *Hunger in the Arctic: Food (in) security in Inuit communities - a discussion paper*. Retrieved September 30, 2008, <http://www.naho.ca/inuit/e/healthfactors/food.php#references>
- Chan, H.M., Fediuk, K., Hamilton, S., Rostas, L., Caughey, A., Kuhnlein, H., et al. (2006). Food security in Nunavut, Canada: Barriers and recommendations. *International Journal of Circumpolar Health*, 65(5), 416-431.
- Che, J., & Chen, J. (2001). Food insecurity in Canadian households. *Health Reports*, 12, 11-22.
- Creswell, J.W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage publications.
- Duhaime, G., Chabot, M., & Gaudreault, M. (2002). Food consumption patterns and socioeconomic factors among Inuit of Nunavik. *Ecology of Food and Nutrition*, 41(2), 91-118.
- Dunn, J.R. & Hayes, M.V. (1999). Toward a lexicon of population health. *Canadian Journal of Public Health*, 90(Suppl. 1), S7-10.
- Fleiss, J.L. (1981). *Statistical methods for rates and proportions*. 2<sup>nd</sup> ed. John Wiley & Sons, New York.

- Food and Agriculture Organization. (2002). *The state of food insecurity in the world 2001*. Rome.
- Furgal, C. & Seguin, J. (2006). Climate change, health, and vulnerability in Canadian northern Aboriginal communities. *Environmental Health Perspectives, 114*(12), 1964-1970.
- Guyot, M., Dickson, C., Paci, C., Furgal, C., & Chan, H.M. (2006). Local observations of climate change and impacts of on traditional food security in two northern Aboriginal communities. *International Journal of Circumpolar Health, 65*(5) 403-415).
- Hamelin, A.M., Habicht, J.P., & Beaudry, M. (1999). Food insecurity: Consequences for the household and broader social implications. *Journal of Nutrition, 129*, 525S-528S.
- Hamelin, A.M., Beaudry, M. & Habicht, J-P. (2002). Characterization of household food insecurity in Quebec: Food and feelings. *Social Science & Medicine, 54*(1), 119-132.
- Hamm, W.W., & Bellows, A.C. (2003). Community food security and nutrition educators. *Journal of Nutrition Education and Behavior, 35*(1), 37-43.
- Health Canada. (2005). *A statistical profile on the health of First Nations in Canada for the year 2000*. Retrieved September 29, 2008, from <http://healthcanada.gc.ca/FNHealthStats>
- Health Canada. (2007). *Income-related household food security in Canada*. Canadian Community Health Survey Cycle 2.2, Nutrition (2004), Ottawa.

- Indian and Northern Affairs Canada. (2008). *Food cost*. Retrieved June 15, 2009, from <http://www.ainc-inac.gc.ca/nth/fon/fc/hpsr-eng.asp>
- Indian and Northern Affairs Canada. (2009). *Food Mail Program - Information sheet*. Ottawa. Retrieved May 15, 2009, from <http://www.ainc-inac.gc.ca/nth/fon/fm/index-eng.asp>
- Inuit Tapiirit Kanatami.(n.d.). *Inuit and diabetes, 2007*. Retrieved October 25, 2008, from <http://www.itk.ca/health/diabetes-index.php>
- Kirkpatrick, S. I., & Tarasuk, V. (2008). Food insecurity is associated with nutrient inadequacies among Canadian adults and adolescents. *Journal of Nutrition, 138*(3), 604-612.
- Kuhnlein, H.V., Receveur, O., Soueida, R., & Egeland, G.M. (2004). Arctic indigenous peoples experience the nutrition transition with changing dietary patterns and obesity. *Journal of Nutrition, 124*, 1447-1453.
- Kuhnlein, H.V., & Receveur, O. (1996). Dietary change and traditional food systems of Indigenous peoples. *Annual Review of Nutrition, 16*, 417-442.
- Lambden, J., Receveur, O., Marshall, J., & Kuhnlein, H.V. (2006). Traditional and market food access in Arctic Canada is affected by economic factors. *International Journal of Circumpolar Health, 65*(4), 331-340.
- Lambden, J., Receveur, O., & Kuhnlein, H.V. (2007). Traditional food attributes must be included in studies of food security in the Canadian Arctic. *International Journal of Circumpolar Health, 66*(4), 308-319.
- Lawn, J., & Harvey, D. (2001). *Change in nutrition and food security in two Inuit communities, 1992 to 1997*. Indian and Northern Affairs Canada. Ottawa.

- Lawn, J., & Harvey, P. (2003). *Nutrition and food security in Kugaaruk, Nunavut: Baseline survey for the Food Mail Pilot Project*. Indian and Northern Affairs Canada. Ottawa.
- Lawn, J., & Harvey, D. (2004). *Nutrition and food security in Kangiqsujuaq, Nunavik*. Indian and Northern Affairs Canada. Ottawa.
- Lawn, J., & Harvey, D. (2004). *Nutrition and food security in Fort Severn, Ontario: Baseline survey for the Food Mail Pilot Project*. Indian and Northern Affairs Canada. Ottawa.
- Ledrou, I., & Gervais, J. (2005). Food insecurity. *Health Reports*, 16(3), 47-51.
- Nakano, T., Fediuk, K., & Kuhnlein, H.V. (2005). Dietary nutrients and anthropometry of Dene/Métis and Yukon children. *International Journal of Circumpolar Health*, 64(2), 147-156.
- Nunavut Tunngavik Inc. (n.d.). *Nunavut Harvesters Support Program*. Retrieved May 20, 2009, from <http://www.tunngavik.com/2006/03/07/nunavut-harvesters-support-program/>
- National Aboriginal Health Organization. (2007). *Factors affecting Inuit health*. Retrieved May 30, 2008, from <http://www.naho.ca/inuit/e/healthfactors/>
- Power, E. M. (2007). *Food security for First Nations and Inuit in Canada - Background paper*. First Nations and Inuit Health Branch - Health Canada. Ottawa.
- Power, E. M. (2008). Conceptualizing food security for aboriginal people in Canada. *Canadian Journal of Public Health-Revue Canadienne De Santé Publique*, 99(2), 95-97.



- Rose, D., & Oliveira, V. (1997). Nutrient intakes of individuals from food-insufficient households in the United States. *American Journal of Public Health, 87*, 1956-1961.
- Receveur, O., Boulay, M. & Kuhnlein, H.V. (1997). Decreasing traditional food use affects diet quality for adult Dene/Metis in 16 communities of the Canadian Northwest Territories. *Journal of Nutrition, 127*(11), 2179-2186.
- Simple Interactive Statistical Analysis. 2 by 2 table. Retrieved May 16, 2009, from <http://www.quantitativeskills.com/sisa/statistics/twoby2.htm>
- Schaefer, O. (1977). Changing dietary patterns in the Canadian north. *Journal of the Canadian Dietetic Association, 38*, 17-25.
- Statistics Canada. (2008). *Indigenous peoples in Canada in 2006: Inuit, Métis and First Nations, 2006 census*. Ottawa: Statistics Canada, Cat. No. 97-558-XIE, 2008.
- Stuff, J.E., Casey, P.H., Szeto, K.L., Gossett, J.M., Robbins, J.M., Simpson, P.M. et al. (2004). Household food insecurity is associated with adult health status. *Journal of Nutrition, 134*, 2330-2335.
- Van Oostdam, J., Donaldson, S.G., Feeley, M., Arnold, D., Ayotte, P., Bondy, G. et al. (2005). Human health implications of environmental contaminants in Arctic Canada: A review. *Science of the Total Environment, 351*, 165-246.
- Vozoris, N.T., & Tarasuk, V.S. (2003). Household food insufficiency is associated with poorer health. *Journal of Nutrition, 133*, 120-126.

- Waldram, J.B., Herring, D.A. & Young, T.K. (2007). *Aboriginal health in Canada: Historical, cultural, and epidemiological perspectives*. (2<sup>nd</sup> ed.), Toronto: University of Toronto Press Inc.
- Willows, N.D. (2005). Determinants of healthy eating in indigenous peoples in Canada: The current state of knowledge and research gaps. *Canadian Journal of Public Health*, 96, S32-S36.
- World Food Summit. (1996). *Rome declaration on world food security*. Rome.
- Young, T.K. & Bjerregaard, P. (2008). *Health transitions in Arctic populations*. Toronto: University of Toronto Press Inc.
- Young, T.K. (1990). Contributions to chronic disease prevention and control: Studies among the Kivalliq Inuit since 1990. *International Journal of Circumpolar Health*, 62, 323-330.

## APPENDIX A. 18-ITEM FOOD SECURITY QUESTIONNAIRE

This section asks questions about being able to afford food for your household. Some of the questions are very personal and may be difficult for you to answer. However, this information will help researchers, community and health leaders to have a better understanding of problems facing families in this community and to design better programs to improve food security. This information is strictly confidential.

### Food Security: Stage 1

The first statements are about the food eaten in your household in the last 12 months and whether you were able to afford the food you need. For each of these statements, please tell me whether this happened often, sometimes or never for your household in the last 12 months.

FSC\_Q1. In the last 12 months, did you ever worry whether the food for you and your family would run out before you have money to buy more?

- 1- Often
- 2- Sometimes
- 3- Never
- 98-DNK
- 99-NR

FSC\_Q2. In the last 12 months, were there times when the food for you and your family just did not last, and there was no money to buy more?

- 1- Often
- 2- Sometimes
- 3- Never
- 98-DNK
- 99-NR

FSC\_Q3. In the last 12 months, were there times when you and your family could not afford to eat healthy food?

- 1- Often
- 2- Sometimes
- 3- Never
- 98-DNK
- 99-NR

FSC\_Q4. [IF CHILDREN UNDER 18 YEARS OLD IN HOME, ASK] In the last 12 months, were there times when you could only feed your children less expensive foods because you were running out of money to buy food?

- 1- Often
- 2- Sometimes
- 3- Never
- 97-NA
- 98-DNK
- 99-NR

FSC\_Q5. [IF CHILDREN UNDER 18 YEARS OLD IN HOME, ASK] In the last 12 months, were there times when it was not possible to feed the children a healthy meal, because there was not enough money?

- 1- Often
- 2- Sometimes
- 3- Never
- 97-NA
- 98-DNK
- 99-NR

Food Security: Stage 2

For Interviewer: Did the respondent answer “often” or “sometimes” to any one of the questions FSC\_q1 to FSC\_q5?

- 1- Yes            Continue
- 2- No            Go to Q23

FSC\_Q6. [IF CHILDREN UNDER 18 YEARS OLD IN HOME, ASK] In the last 12 months, were there times when the children in the house were not eating enough because there was no money to buy enough food?

- 1- Often
- 2- Sometimes
- 3- Never
- 97-NA
- 98-DNK
- 99-NR

FSC\_Q7. In the last 12 months, did you or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money to buy food?

- 1- Yes           Continue
- 2- No            Go to Q9
- 98- DNK        Go to Q9
- 99- NR          Go to Q9

FSC\_Q8. How often did this happen?

- 1- Almost every month
- 2- Some months but not every month
- 3- Only 1 or 2 months
- 98- DNK
- 99- NR

FSC\_Q9. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money to buy food?

- 1- Yes
- 2- No
- 98- DNK
- 99- NR

FSC\_Q10. In the last 12 months, were you ever hungry but didn't eat because you couldn't afford enough food?

- 1- Yes
- 2- No
- 98- DNK
- 99- NR

FSC\_Q11. In the last 12 months, did you lose weight because you didn't have enough money for food?

- 1- Yes
- 2- No
- 98- DNK
- 99- NR

Food Security: Stage 3

For Interviewer: Did the respondent answer "yes" to any of the questions from FSC\_q6 to FSC\_q11?

- 1- Yes            Continue
- 2- No            Go to Q23

FSC\_Q12. In the last 12 months, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food?

- 1- Yes            Continue
- 2- No            Go to Q14
- 98- DNK        Go to Q14
- 99- NR          Go to Q14

FSC\_Q13. How often did this happen?

- 1- Almost every month
- 2- Some months but not every month
- 98-DNK
- 99-NR

Again, some of the next questions are about persons living in the household who are under 18 years of age.

FSC\_Q14. [IF CHILDREN UNDER 18 YEARS OLD IN HOME, ASK] In the last 12 months, did you ever cut the size of their meals because there wasn't enough money for food?

- 1- Yes
- 2- No
- 97- NA
- 98- DNK
- 99- NR

FSC\_Q15. [IF CHILDREN UNDER 18 YEARS OLD IN HOME, ASK] In the last 12 months, did any of the children ever skip meals because there wasn't enough money for food?

- 1- Yes            Continue
- 2- No            Go to Q17
- 97- NA          Go to Q17
- 98- DNK        Go to Q17
- 99- NR          Go to Q17

FSC\_Q16. How often did this happen?

- 1- Almost every month
- 2- Some months but not every month
- 3- Only 1 or 2 months
- 97- NA
- 98- DNK
- 99- NR

FSC\_Q17. [IF CHILDREN UNDER 18 YEARS OLD IN HOME, ASK] In the last 12 months, were the children ever hungry but you just couldn't afford more food?

- 1- Yes
- 2- No
- 97- NA
- 98- DNK
- 99- NR

FSC\_Q18. [IF CHILDREN UNDER 18 YEARS OLD IN HOME, ASK] In the last 12 months, did your children ever not eat for a whole day because there wasn't enough money for food?

- 1- Yes
- 2- No
- 97- NA
- 98- DNK
- 99- NR

## **APPENDIX B. HOUSEHOLD AND COUNTRY FOOD QUESTIONS**

### **Questions related to the household**

HS\_Q2. Is your home (choose of the following):

- 1-Public housing
- 2-Private housing
- 3-Government of Nunavut housing
- 4-Federal housing
- 5-Other, specify:
- 98-DNK
- 99-NR

HS\_Q4. Does your home have a problem with mould OR is in need of major repairs (for example: a new roof, plumbing repairs, structural repairs)?

- 1-Mould
- 2-Major repairs
- 3-Both above
- 4-Neither
- 98-DNK
- 99-NR

HS\_Q23. In the past month, did anyone in your household receive income support?

- 1-Yes
- 2-No
- 98-DNK
- 99-NR

### **Questions related to country food**

HS\_Q12. Is there an active hunter in your household?

- 1- Yes
- 2- No
- 97- NA
- 98- DNK
- 99- NR



HS\_Q13. Do you or your household distribute country food to other members of the community?

- 1- Yes
- 2- No
- 98- DNK
- 99- NR

HS\_Q14. Do you prefer mainly country food or store food or a mix of both?

- 1- Country food
- 2- Store foods
- 2- Mix of both
- 98- DNK
- 99- NR

HS\_Q15. Would you prefer eating more country food than you can get?

- 1- Yes
- 2- No
- 3- Neutral
- 98- DNK
- 99- NR

HS\_Q18. In the past 12 months, how did you get your country food? Circle all that apply.

- 1- Hunting
- 2- From family, including family from other communities
- 3- From friends, including friends from other communities
- 4- From stores
- 5- Community freezer/Hunters and Trappers Organization
- 6- No country food acquired in the home
- 7- Not interested in country food
- 98- DNK
- 99- NR

HS\_Q19. If you (and your household) cannot get country food, can you tell me why? (individuals are prompted for up to 3 reasons)

- 1- No active hunter in the household
- 2- Active hunter in household is sick or away
- 3- Not enough money to buy supplies and gas to go hunting/fishing
- 4- No skidoo
- 5- No boat
- 6- Skidoo broken
- 7- Boat broken
- 8- Country food not abundant in the area
- 9- Country food is not important to person
- 10- Other, explain \_\_\_\_\_
- 98- DNK
- 99- NR

HS\_Q20. What do you do when you (and your household) run out of country food? (individuals are prompted for up to 3 actions)

- 1- Borrow/ask for country food from friends or family
- 2- Buy more store food
- 3- Go hunting or fishing
- 4- Do without
- 5- Community Freezer/Hunters and Trappers Organization
- 6- Other, explain \_\_\_\_\_
- 98- DNK
- 99- NR

HS\_Q21. How would you compare the costs of getting country food to the costs of buying groceries from the store?

- 1- Country food is cheaper than store bought food
- 2- Country food is just as costly as store bought food
- 3- Country food is more expensive than store bought food
- 98- DNK
- 99- NR

HS\_Q22. Are you worried about the contaminants in the country food that you and your family eat?

- 1- Yes
- 2- No
- 3- Somewhat
- 98- DNK
- 99- NR

## APPENDIX C. ADDITIONAL FOOD SECURITY QUESTIONS

Did the respondent answer “yes” to any of the questions from FSC\_Q6 to FSC\_Q18?

- 1- Yes            Continue
- 2- No            Go to Q23

FSC\_Q19. I would like to ask you about why your household was unable to afford enough food. Can you tell me the main reason? [Do not read categories. Record the first 3 reasons.]

- 1- Not working
- 2- Waiting for income support
- 3- Waiting for EI (employment insurance)
- 4- Not enough income
- 5- Gave money away
- 6- Gave food to others in the community
- 7- Had to buy hunting, fishing or trapping equipment, supplies or gas
- 8- Had to pay bills
- 9- Spent money on cigarettes, gambling, drugs, alcohol
- 10- Food costs too much
- 11- Other, explain \_\_\_\_\_
- 98- DNK
- 99- NR

Up to 3 main reasons recorded.

FSC\_Q20. When your household is unable to afford enough food, what do you do? [Do not read categories. Record the first 3 actions.]

- 1- Ask for more income support
- 2- Ask store manager for more credit
- 3- Borrow money for food from friends or family
- 4- Go over to OR ask for food from family or friends
- 5- Go hunting or fishing
- 6- Ask help from CHR, nurse or doctor
- 7- Do without
- 8- Make an item to sell
- 9- Food bank
- 10- Soup kitchen
- 11- Community Freezer/Hunters and Trappers Organization
- 12- Other, explain \_\_\_\_\_
- 98- DNK
- 99- NR

FSC\_Q21. [IF CHILDREN UNDER 5 YEARS OLD IN HOME, ASK] During the past month, did any of the children in this household receive breakfast, lunch or snacks at day care, a pre-school program or kindergarten?

- 1- Yes
- 2- No
- 97-NA
- 98- DNK
- 99- NR

FSC\_Q22. [IF CHILDREN 6 and 17 YEARS OLD IN HOME, ASK] During the past month, did any of the children in this household receive breakfast, lunch or snacks at school?

- 1- Yes
- 2- No
- 97-NA
- 98- DNK
- 99- NR

**APPENDIX D. RESPONSES TO THE 18-ITEM FOOD SECURITY SCALE FOR THE KIVALLIQ AND QIKIQTAAALUK REGIONS IN NUNAVUT 2007-2008**

	<b>All Households (n=1,022)</b>	<b>Households with Children (n=807)</b>	<b>Households without Children (n=215)</b>
<b>Adult Food Security Scale<sup>1</sup></b>	<b>n (%) responding affirmatively<sup>3</sup></b>		
1. Participant worried about food running out for the family before they had money to buy more.	685 (67.0)	563 (69.8)	122 (56.7)
2. There were times when the food for the participant or the family just did not last and there was no money to buy more.	697 (68.2)	564 (70.0)	133 (61.9)
3. Participant or other household members could not afford to eat healthy food.	574 (56.2)	446 (55.3)	128 (59.5)
4. Participant or other adults in the household cut the size of their meals or skipped meals because there wasn't enough money for food.	415 (40.6)	352 (43.6)	63 (29.3)
5. Participant or other adults in the household cut the size or skipped meals.	347 (34.0)	294 (36.4)	53 (24.7)
6. Participant ate less than they felt they should because there wasn't enough money to buy food.	398 (38.9)	336 (41.6)	62 (28.8)
7. Participant was hungry but didn't eat because they couldn't afford enough food.	325 (31.8)	273 (33.8)	52 (24.2)
8. Participant lost weight because they didn't have enough money for food.	239 (23.4)	195 (24.2)	44 (20.5)
9. Participant or other adults in the household didn't eat for a whole day because there wasn't enough money for food.	250 (24.5)	210 (26.0)	40 (18.6)
10. Participant or other adults in the household didn't eat for a whole day.	246 (24.1)	206 (25.5)	40 (18.6)

		<b>Households with Children (n=807)</b>	
<b>Child Food Security Scale</b>	<b>n (%) responding affirmatively<sup>3</sup></b>		
1. Participant or other adults in the household ate only less expensive foods because they were running out of money to buy more	...	512 (63.4)	...
2. Participant or other adults in the household couldn't feed the children a healthy meal because they couldn't afford to	...	441 (54.7)	...
3. Children were not eating enough because there wasn't enough money for food	...	375 (46.5)	...
4. Participant or other adults in the household cut the size of any of the children's meals because there wasn't enough money for food	...	230 (28.5)	...
5. Any of the children skipped meals because there wasn't enough money for food	...	203 (25.2)	...
6. Any of the children ever skipped meals in three or more months	...	164 (20.3)	...
7. Any of the children were ever hungry but participant couldn't afford more food	...	230 (28.5)	...
8. Any of the children did not eat for a whole day because there wasn't enough money for food	...	144 (17.8)	...

<sup>1</sup> Household/Adult items refer to questions fsc\_q1 to q3 and fsc\_q7 to q13 (Appendix A).

<sup>2</sup> Child items refer to questions fsc\_q4 to 6 and fsc\_q14 to q18 (Appendix A).

<sup>3</sup> Affirmative responses to food security items correspond to: often, sometimes, yes, almost every month and some months but not every month.

... Not applicable