Chapter 9

The value of Inuit elders' storytelling to health promotion during times of rapid climate change and uncertain food security

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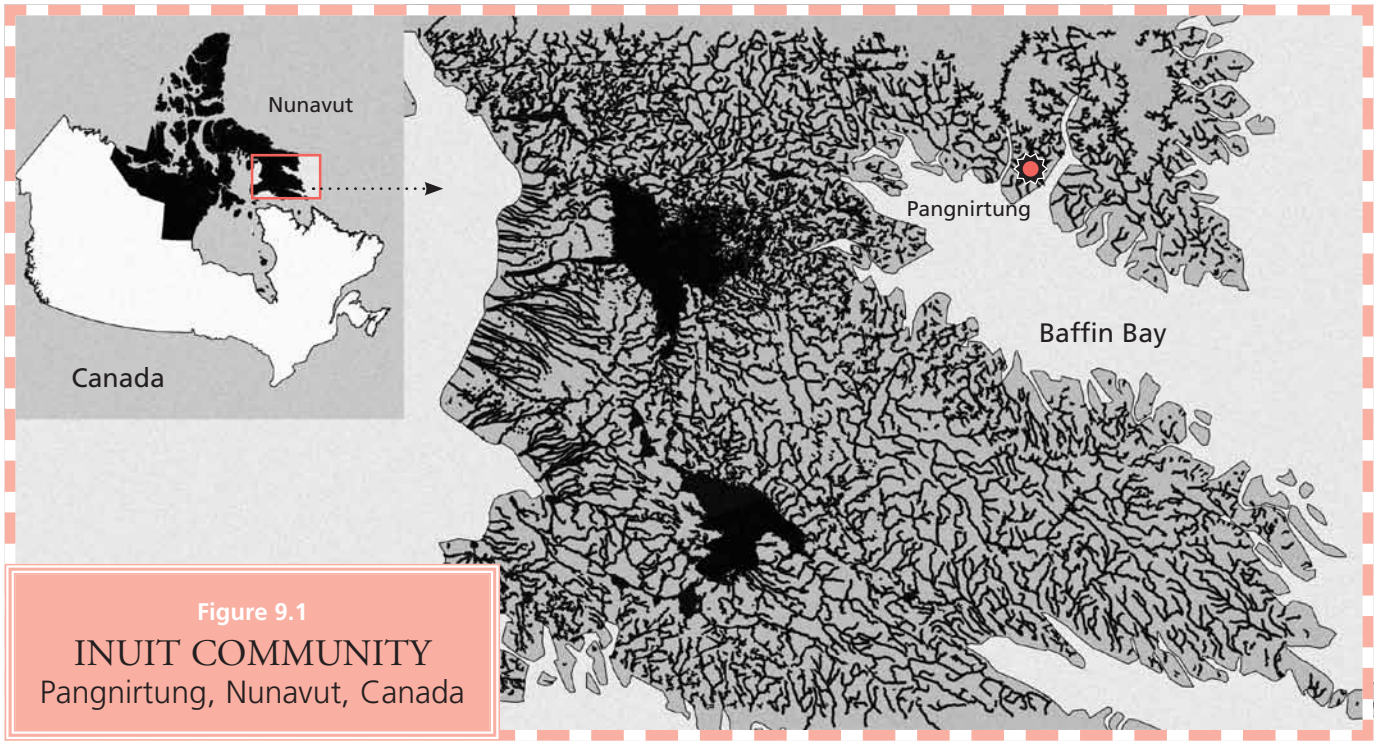

Figure 9.1
INUIT COMMUNITY
Pangnirtung, Nunavut, Canada

Data from ESRI Global GIS, 2006. Walter Hitschfield Geographic Information Centre, McGill University Library.

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Key words > diet, health promotion, storytelling, food security, climate change, aboriginal health, Inuit, Indigenous Peoples

Photographic section >> XVI

> “Our past is preserved and explained through the telling of stories and the passing of information from one generation to the next through what is called the oral tradition. Inuit recognize the importance of maintaining the oral tradition as a part of our culture and way of learning.”
>
> Inuit Tapiriit Kanatami

Abstract

The ongoing nutrition transition in the Canadian Arctic is resulting in an epidemiologic transition towards the emergence of obesity and obesity-related chronic diseases. In response, the community of Pangnirtung in the Baffin Region of Nunavut, Canada, in partnership with the Centre for Indigenous Peoples' Nutrition and Environment, developed a community health promotion project in two phases. The first phase involved collecting health behaviour data from adults (2005) and youth (2006), and recording and transcribing elders' stories on the value of traditional food, including plants and remedies (2006 to 2007). In the second phase, the health behaviour survey data and storytelling were used to help develop an innovative pilot intervention in the community (2008 onwards). The intervention aimed to increase knowledge about traditional food and nutrition and improve nutritional health behaviours through the age-old Inuit tradition of storytelling. It targeted youth and young adults because of community members' concerns that youth were consuming more high-sugar drinks and "junk food" and less traditional food than older adults in the community.

The youth survey found that youth had consumed an average of 1.4 litres of sweet drinks a day, including two cans of pop, over the previous month. It also found that only five traditional food species had been consumed by more than 80 percent of the youth over the previous year, and that youth had a strong preference for caribou meat, with 98.7 percent of them consuming caribou in the past year, at an average of 87.2 g per day among consumers. No other traditional food was consumed to the same degree.

Elders' stories were incorporated into a DVD promoting knowledge and appreciation of a wide range of traditional foods. The stories were also incorporated with modern nutritional health advice for youth radio drama programmes aimed at reducing the high consumption of pop in the community. The DVD and radio programmes have already been pilot tested for effectiveness, cultural relevance and acceptability, and a broader community-wide evaluation of the community radio's nutritional health promotion is currently taking place.

In addition, elders' storytelling revealed elders' perceptions of climate change and its impacts on local flora and fauna, and their resulting concerns for the sustainability of subsistence food species. With climate change now outpacing projections, and potentially threatening favoured subsistence species, elders' storytelling can be a means of building youth's awareness and appreciation of the full range of traditional food available and increasing the diversity of traditional foods consumed. Elders' storytelling also provides opportunities for understanding changes in a historical context and, when combined with modern-day nutrition issues and modern media, may be a means of reaching youth, building social cohesion and promoting Inuit resiliency in a time of rapid climate change and uncertain food security.

Introduction

A nutrition transition has been documented in the Canadian Arctic, with increased consumption of processed market foods that are high in sodium, saturated and trans-fat and added sugars, and with reduced consumption of traditional food (TF) leading to

consequences such as the emergence of obesity and chronic diseases (Johnson-Down and Egeland, 2010; Kuhnlein and Receveur, 1996; Kuhnlein *et al.*, 2004; Jørgensen *et al.*, 2002; Young and Bjerregaard, 2008). TF represents more than a superior source of nutrients and a contributor to dietary adequacy (Fediuk *et al.*, 2002; Egeland *et al.*, 2004; Kuhnlein *et al.*, 2002; 2006); it also symbolizes cultural identity, self-reliance, self-determination and connectedness to the land, and provides social cohesion through shared activities, all of which can contribute to health and well-being (King, Smith and Gracey, 2009; Egeland *et al.*, 2009). Thus, the promotion of Inuit TF is a central feature of the Inuit component of the Indigenous Peoples' Food Systems for Health Program of the Centre for Indigenous Peoples' Nutrition and Environment (CINE). The purpose of the case study described in this chapter was "to utilize traditional knowledge, Inuit storytelling, and country food to promote the health and well-being of community members" in Pangnirtung in the Baffin Region of Nunavut (Figure 9.1) (Egeland *et al.*, 2009).

Community steering committee members envisioned two phases of work. The first phase involved collecting health behaviour data on adults and youth (2005 to 2006) and recording and transcribing elders' stories on the value of TF, including plants and medicinal remedies (2006 to 2007). Community members wanted the elders' stories to be used to help promote TF as part of an effort to combat a dietary transition in their community, as adults and, to a greater extent, youth were thought to be eating more "junk" food and less TF. The health surveys were designed to quantify eating behaviours, to help guide interventions and provide a baseline for future evaluations of trends.

The second phase of the elders' storytelling project was developed to incorporate elders' stories into community health promotion activities targeting primarily youth and young adults. Storytelling is a strong Inuit tradition. The umbrella organization for Inuit in Canada, Inuit Tapiriit Kanatami ("Inuit we are united"), eloquently stated:

> Our past is preserved and explained through the telling of stories and the passing of information from one generation to the next through what is called the oral tradition. Inuit recognize the importance of maintaining the oral tradition as a part of our culture and way of learning.[1]

Inuit *Qaujimajatuqangit* (traditional knowledge) is highly valued, and its incorporation into nutritional health promotion ensures cultural relevancy and acceptability.

This chapter provides details regarding the youth health survey and its findings, and the elders' storytelling interventions, which have been pilot tested and are currently undergoing a broader community-wide evaluation. During the elders' storytelling project, elders' observations of climate change and its impacts on local flora and fauna were captured, along with their concerns about the sustainability of TF species and food security. The chapter therefore draws on information on climate change, and the available literature related to climate change's potential impacts on subsistence food species and food security.

Youth health survey, Pangnirtung

Objectives and methods

As part of community and CINE collaboration, a youth health survey was conducted to document current dietary consumption patterns and body mass index (BMI) among youth aged 11 to 17 years. This information was to guide health promotion activities targeting youth in the community (Yohannes, 2009).

Ethics approval was granted by the McGill Faculty of Medicine Institutional Review Board; a research licence was issued by Nunavummi Qaujisaqtulirijikkut (the Nunavut Research Institute); and the Hamlet of Pangnirtung approved the research work. The age range of 11 to 17 years was selected for the convenience of conducting the survey at the local secondary school.

The youth survey took place over ten weekdays in May 2006, with all the youth attending school invited to participate. Community research assistants were hired and trained and conducted the interviews with

[1] www.itk.ca/publications/5000yearheritage.pdf

CINE staff members. Food model kits were used in the 24-hour dietary recalls to facilitate recollection and the reporting of portion sizes.

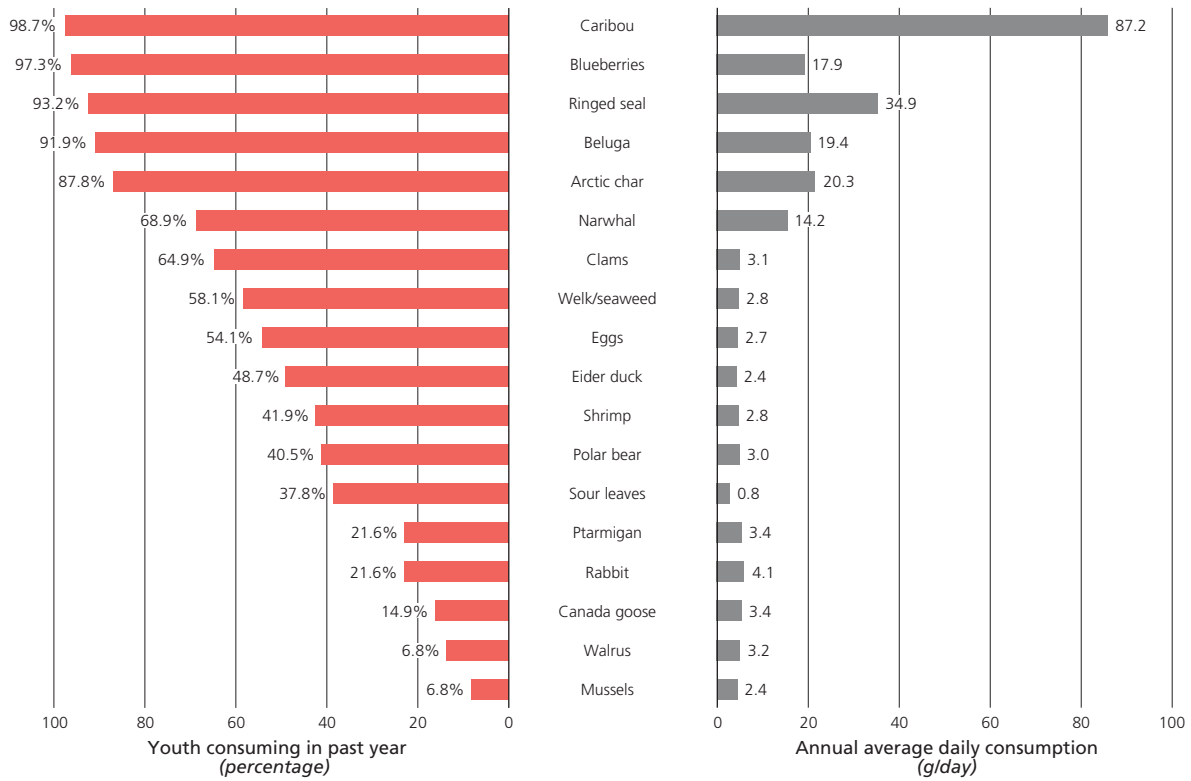
Parents were contacted through the school, and their informed consent and assent were obtained. The total of 75 students participating in the survey represented nearly all those attending school in May and approximately 50 percent of all the youth in their age range in the community, according to information from school administrators.

Each youth completed two 24-hour recalls on non-consecutive days, a semi-quantitative 38-item past-year traditional food frequency questionnaire (FFQ; Annex 9.1) and a five-item past-month market FFQ. The traditional FFQ was developed by CINE with guidance from hunters, trappers and other key informants. The market FFQ was designed to capture usual consumption of beverages and chips, based on community consultations indicating that chips would be a good indicator of the consumption of high-energy, low-nutrient-dense snack foods.

Harvest calendars collected through key informant interviews in the community were used to define the in- and out-of-season periods associated with each TF species, to estimate average TF consumption over the entire past year. Because of extremely high reports of TF consumption in the traditional FFQ, extreme intakes were truncated to the 90th percentile (i.e., all those reporting amounts higher than the 90th percentile were reassigned the 90th percentile value).

A database was developed in Microsoft Excel 2003. The dietary recalls were entered into CANDAT software (Godin, London, Ontario, Canada, version 2007), and nutrient intakes were estimated using the Canadian Nutrient File (Health Canada, 2007) and a file developed at McGill University with 2 000 additional foods, derived from food labels and standardized recipes. SAS version 9.1 (SAS Institute, Cary, North Carolina, United

Figure 9.2 Top 18 traditional food items consumed in the past year, 2006



States of America) was used in all analyses. Macro- and micronutrient intakes were adjusted to reflect usual intakes, using procedures outlined by the Institute of Medicine (2000). When within-person variability was larger than between-person variability, calculation of usual intakes was not possible, and the unadjusted means of two days of dietary intake were reported.

Results

Traditional food frequency

Of the 75 youth participating in the survey, 39 were boys and 36 girls. Only five TF species had been consumed by 80 percent or more of the youth in the previous year: caribou (*Rangifer tarandus*), blueberries (*Vaccinium myrtillus*), ringed seal (*Phoca hispida*), beluga (*Delphinapterus leucas*) and Arctic char (*Salvelinus alpines*) (Figure 9.2). Among these five items, caribou meat was by far the most popular and heavily consumed TF, with 98.7 percent of the youth consuming it in the previous year, at an annual average daily consumption of 87.2 g per consumer, based on the truncated traditional FFQ data. No other TF was consumed to the same degree among youth. Although Arctic char was consumed by 87.8 percent, the annual average daily consumption was only 20.3 g among consumers. Narwhal (*Monodon monoceros*) was the sixth most popular TF species, consumed by 68.9 percent of youth in the previous year, with a daily average consumption of 14.2 g over the year. Much lower percentages of youth reported consuming the other TF items, each with an annual average daily consumption of less than 3.5 g among consumers.

Market food frequency

Based on the market FFQ, youth reported consuming a median intake of 28 g of chips per day, equivalent to more than half a 44-g bag (Table 9.1). They also reported a high degree of daily sweet drink consumption, with median consumptions for fruit juice of 344 ml, powdered sugar drinks of 344 ml, and carbonated beverages of 710 ml (equivalent to two cans of pop per day). In contrast to the high soft drink consumption, at 149 ml/day, the youth reported a median milk consumption that was less than a third of the intake recommended by Canada's Food Guide for First Nations, Inuit and Métis (Health Canada, 2007).

24-hour dietary recalls and micronutrient intakes

Forty-four youth (58.7 percent) reported consuming TF in one or both of the 24-hour recalls, with TF contributing 11.8 percent (± 10.8) of total energy intake among consumers. Adjusted mean micronutrient intakes were evaluated for those consuming and those not consuming TF in one or both of the past 24-hour dietary recalls (Table 9.2). Iron, vitamin A, phosphorous, zinc, selenium and vitamin D were not significantly higher in boys who consumed TF than in those who did not. Girls who consumed TF had

Table 9.1 Median (interquartile range) past-month daily consumption of selected market foods by Inuit youth aged 11 to 17 years, by consumers and non-consumers of TF, Pangnirtung, Nunavut, 2006[a]

	Traditional food		
	TF consumed**[a] (n = 43)[b]* ***Median (25th–75th percentile)	***TF not consumed** (n = 31)* ***Median (25th–75th percentile)***	***Total** (n = 74)* ***Median (25th–75th percentile)***
Chips *(g)*	28.0 (12.3–80.0)	35.0 (8.00–56.0)	28.0 (12.0–56.0)
Fruit juice *(ml)*	344 (188–1 032)	258 (172–688)	344 (188–688)
Milk *(ml)*	158 (22.6–344)	125 (0–500)	149 (22.6–376)
Powdered drinks *(ml)*	344 (49.1–1 000)	376 (71.4–600)	344 (71.4–710)
Soft drinks *(ml)*	710 (355–1 376)	1065 (355–1 775)*	710 (355–1420)

* $p \leq 0.05$, Wilcoxon test.
[a] Consumed at least one TF item in one or both 24-hour recalls versus consumed no TF in either.
[b] One youth missing food frequency data; reported in one or both 24-hour recalls.
Source: Adapted from Yohannes, 2009.

significantly higher iron ($p \leq 0.01$) and vitamin A ($p \leq 0.01$) intakes. Both boys and girls who consumed TF had significantly higher protein intakes ($p \leq 0.05$) than those who did not. TF consumers reported greater protein intake as percentage of energy on the previous day than did non-consumers: among those consuming TF, 19.8 percent (± 7.3) and 17.3 percent (± 6.8) of energy was in the form of protein for boys and girls, respectively; whereas among those not consuming TF in the previous two days the equivalent figures were 14.0 percent (± 4.8) for boys and 11.7 percent (± 3.5) for girls (t-tests, $p \leq 0.05$). No differences in percentages of energy as carbohydrate or fat were observed between TF consumers and non-consumers (Table 9.3). However, boys who consumed TF derived significantly less energy from saturated fat ($p \leq 0.01$).

Based on the two 24-hour recalls, 92 percent of the youth reported consuming soft drinks on one or both days, with an average consumption of 2.5 cans (875 ml) per day among consumers. Those who consumed TF in either of the two 24-hour recalls reported significantly lower median intakes of carbonated beverages over the previous month (710.0 ml/day) than those who did not consume TF (1 065.0 ml/day) (Wilcoxon $p \leq 0.05$) (Table 9.1).

Discussion

Although the proportion of youth consuming any TF in either or both of the 24-hour recalls approached 60 percent, and the vast majority of youth had consumed some kind of TF in the previous year, there was a general lack of diversity in the species being consumed regularly, as indicated by the traditional FFQ. By far the strongest preference was for caribou meat, as indicated by the high average daily consumption over the previous

Table 9.2 Usual mean micronutrient intakes among Inuit boys and girls aged 11 to 17 years, by consumers and non-consumers of TF, in two 24-hour dietary recalls on non-consecutive days, Pangnirtung, Nunavut, 2006[a]

	Boys' mean intake		*Girls' mean intake*	
	TF consumed** (n = 14)* ***Mean (SD)	***TF not consumed** (n = 25)* ***Mean (SD)***	***TF consumed** (n = 17)* ***Mean (SD)***	***TF not consumed** (n = 19)* ***Mean (SD)***
Iron (mg)	18.7 (10.0)	14.3 (5.2)	19.8 (9.2)	13.1 (4.2)*
Vitamin C (mg)	107.7 (88.2)	128.6 (86.9)	160.6 (95.6)	156.5 (82.6)
Vitamin A (µg)	307.0 (101.0)	257.2 (59.9)	362.0 (144.2)	253.6 (79.9)*
Phosphorous (mg)	1 209.8 (419.2)	1 019.4 (317.3)	1 235.3 (222.7)	1 155.0 (279.8)
Selenium (µg)	65.9 (37.4)	63.0 (30.9)	75.0 (27.5)	66.6 (27.4)
Zn (mg)	10.5 (4.0)	8.8 (3.6)	9.3 (1.9)	8.1 (2.0)
B^6 (mg)[b]	1.4 (0.6)	1.3 (0.6)	1.5 (0.7)	1.6 (0.7)
Niacin (mg)[b]	35.6 (19.0)	29.1 (11.0)	38.4 (14.8)	4.0 (16.3)
Thiamin (mg)	1.6 (0.4)	1.6 (0.5)	1.5 (0.3)	1.4 (0.4)
Riboflavin (mg)[b]	1.5 (0.3)	1.6 (0.3)	1.7 (0.6)	2.1 (0.9)
Calcium (mg)	572.5 (126.0)	570.6 (116.2)	553.2 (179.2)	587.2 (167.8)
Vitamin D (µg)[b]	2.2 (1.3)	2.7 (1.7)	2.8 (1.5)	3.4 (2.0)
Folate (µg)[c]	372.1 (187.4)	295.2 (135.7)	322.0 (105.2)	364.3 (82.3)
Total fibre (g)	8.7 (2.1)	9.5 (4.2)	10.3 (4.2)	11.0 (4.7)

* $p \leq 0.01$, Student's t-test.
[a] Adjusted usual mean (SD) intake unless otherwise noted.
[b] Designates when within-person variability among girls was larger than between-person variability; therefore, the unadjusted mean of two days' intake is presented rather than the adjusted mean.
[c] Designates when within-person variability among boys was larger than between-person variability; therefore, the unadjusted mean of two days' intake is presented rather than the adjusted mean.
Source: Adapted from Yohannes, 2009.

Table 9.3 Total energy and percentages of energy from macronutrients among Inuit girls and boys, by consumers and non-consumers of TF, in two 24-hour dietary recalls on non-consecutive days, Pangnirtung, Nunavut, 2006[a]

	Boys (n = 36)		*Girls (n = 39)*	
	TF consumed[c] (n = 25) ***Mean (SD)***	***TF not consumed[c] (n = 14)*** ***Mean (SD)***	***TF consumed[b] (n = 19)*** ***Mean (SD)***	***TF not consumed[b] (n = 17)*** ***Mean (SD)***
Total energy				
(kcal)	2 128 (745)	1 922 (762)	2 213 (515)	2 416 (817)
(kJ)	8 910 (3 119)	8 047 (3 190)	9 265 (2 156)	10 115 (3 420)
% protein	19.8 (7.3)	14.0 (4.8)*	17.3 (6.8)	11.7 (3.5)§
% carbohydrate	57.8 (8.4)	60.4 (9.9)	58.5 (11.3)	63.8 (8.5)
% fat[c]	22.8 (3.9)	26.6 (6.0)	24.5 (3.4)	25.5 (5.9)
% saturated fat	7.0 (1.5)	8.5 (1.9)§	7.8 (1.9)	7.8 (2.2)
% MUFA[c]	8.7 (1.9)	10.1 (2.3)	9.9 (1.7)	9.5 (2.9)
% PUFA[b, c]	4.4 (1.3)	4.1 (2.2)	4.7 (1.6)	4.8 (1.7)

* $p \leq 0.05$.
§ $p \leq 0.01$, Student's t-test.
MUFA = monounsaturated fatty acid.
PUFA = polyunsaturated fatty acid.
[a] Adjusted usual mean (SD) intake unless otherwise noted.
[b] For girls, designates when within-person variability was larger than between-person variability; therefore, the unadjusted mean of two days' intake is presented rather than the adjusted mean.
[c] For boys, designates when within-person variability was larger than between-person variability; therefore, the unadjusted mean of two days' intake is presented rather than the adjusted mean.
Source: Adapted from Yohannes,2009.

year. A preference for caribou was also identified among Inuit preschoolers in 16 Nunavut communities, where caribou consumption by 84.3 percent of the preschoolers far exceeded that of any other TF species in the previous month (Johnson-Down and Egeland, 2010). In CINE's previous dietary surveys across the Arctic too, caribou was a prominent component of the TF system (Kuhnlein and Receveur, 2007; Kuhnlein and Soueida, 1992). The results indicate that a broad variety of TFs could be promoted for consumption by youth.

The high consumption of sugar-sweetened beverages reported in the market FFQ was also observed in the 24-hour recalls. The consumption of soft drinks has been associated with obesity, and reduction in soft drink consumption has been related to weight loss (Chen *et al.*, 2009; Giammattei *et al.*, 2003; Sanigorski, Bell and Swinburn, 2007), although not all studies show consistent associations between soft drink consumption and weight gain or obesity (Gibson, 2008).

In the 24-hour recalls, the lower consumption of soft drinks among youth who consumed TF than among those who did not was an unexpected finding. Although the mechanisms are still not clear, protein aids in satiety (Tome, 2004). Thus, greater protein intake among youth who habitually consume TF may, in part, explain the lower amount of pop consumed among TF consumers, as those consuming more protein may not have the same degree of cravings for sugar-sweetened beverages. Conversely, those who consume TF may be more traditional and may therefore avoid sugared beverage consumption. While additional research is needed on this topic, the current findings highlight the unexpected ways in which even small amounts of nutrient-dense TF may promote or be associated with a healthy diet in the contemporary context.

Food frequency data can both over- and underreport food items, and can vary by demographics such as age and sex (Marks, Hughes and van der Pols, 2006). Food items that are well liked by youth could be overreported because of the social desirability of reporting culturally valued foods. Therefore, the amounts recalled should be interpreted with caution. However, a strength

of the research was that extreme reports of TF were truncated to the 90th percentile, which would limit the extent of overreporting in the data. Another strength of the study was that two approaches were used to assess dietary behaviours, the two 24-hour recalls and the FFQ, which provided opportunities to evaluate consistencies in the data.

In summary, the survey highlighted the low diversity of TF in youth's diet and the high intake of sugared beverages and high-fat snacks. In an effort to enhance youth's knowledge of TF, a storytelling project with elders was initiated.

Storytelling and health promotion research

Background

During storytelling interviews, community members asked elders about their experiences and knowledge of TF, including hunting and harvesting activities, what parts of animals were eaten by men and women, medicinal remedies, how TF differs from market food, and the elders' observations related to climate change. In 2006 and 2007, a total of 21 elders were interviewed in Inuktitut (by author Jonah Kilabuk), and their interviews were transcribed into English (by Looee Okalik). Interviews ranged in length from 20 to 45 minutes. The storytellers' informed consent was obtained for the use of their stories in publications and media.

Two pilot interventions were developed based on the stories: elders' storytelling in a DVD format; and youth radio drama incorporating elders' stories, to build appreciation of TF and encourage healthy food choices among youth.

Elders' stories in DVD format

Objectives and methods

The objective of this pilot intervention was to determine whether the use of elders' stories in a DVD would be an effective means of transferring traditional knowledge from Pangnirtung elders to youth (Yohannes, 2009). The elders were identified by community steering committee members and through the community Elder Centre. The DVD was developed by CINE (Sennait Yohannes) and steering committee members; Inuktitut with English subtitles was used throughout. Five of the 21 interviews with elders were used, as they provided in-depth information on three themes, each of which corresponded to a segment of the DVD: TFs and how they differ from market foods; what parts of the animal were eaten by men and women; and TFs that serve as medicinal remedies. The three themes were chosen by the steering committee and CINE, based on a review of the contents of the elders' stories.

Informed consent was obtained from the youth (students) participating in the pre- and post-DVD viewing assessments. CINE and the community health promotion steering committee developed a series of 28 true/false questions, based on the content of the five elders' interviews captured in the DVD (Yohannes, 2009). Four of the 28 questions had to be dropped from the assessments, as youth had problems understanding them. An increase in the number of correct responses to the true/false questions was considered an indication that viewing the draft DVD had improved knowledge of TF among the youth. The pilot intervention took place in May 2008.

During the first week, students completed the pre-DVD questionnaire and then viewed the first of two segments of the DVD; the second segment was played the following week, and the students then completed the post-viewing questionnaire. However, because of community events, not all students were present on both the pre- and post-DVD viewing occasions.

Results

The pilot intervention found that the mean knowledge score based on the true/false questionnaire among the 24 youth who took the post-viewing assessment was significantly higher than that among the 19 youth who took the pre-viewing assessment (post-viewing 15.8 ± 2.9, versus pre-viewing 13.8 ± 3.0; independent sample t-test $p \leq 0.05$). Similar results were obtained in the analyses of ten youth who took both the pre- and post-viewing assessments (post-viewing 15.5 ± 2.5, versus pre-viewing 13.3 ± 2.5; paired t-test, $p \leq$

Box 9.1
Example of radio drama narrative

Maryann: When it comes to our health it is important to understand *piluajjaiqsimaniq* [Inuktitut for "moderation"]. Some foods and drinks are okay for us to have, but only in small amounts. We have to be very careful how much we eat or drink. Pop is an example of one of these foods. Too much pop can lead to serious health problems, including weight gain, cavities in our teeth, problems sleeping and concentrating at school or work. Let's listen to a story told by Josephee Keenainak who talks about country food and how it affects his life.

Taped elder: This excerpt from *Josephee's story* explains the traditions of country food, the importance of country food in our culture, and eating certain foods in *piluajjaiqsimaniq*.

"Our parents kept us informed and taught us. With *mattaaq* (whale skin) being very delicious, we were told not to overindulge eating *mattaaq* if we hadn't eaten any meat prior, we were also told not to eat whale meat if its oil had yellowed, for it had affected the meat. Those were always told and there weren't many to be cautious of. I had heard that one individual had overindulged on *mattaaq* upon having craved it. That is why we were reminded to eat a good amount.

As I was raised decades back and was informed of food scarcity that we could confront during life. We tend to eat meat wisely, give thanks upon gain [i.e., obtaining it] and give some meat to other people for their fulfilment. God appreciates it when we share our foods with others. My fellow Inuit and younger generations need to care for food well and on healthy eating. When there is country food at hand, take pleasure in enjoying it. Our bodies will be healthier. It was said that Inuit had healthier blood at the time of traditional food consumption. Cut down on the intake of junk foods. I was always told that my blood was healthy for I have minimal consumption of food with sweets. Let us be conscious, although we do our best, to live healthily for our bodies to be healthy."

Maryann: In his story, Josephee Keenainak talks about eating certain country foods only in *piluajjaiqsimaniq*, the example that he uses is *mattaaq*. We can use this knowledge that Josephee teaches us to be careful about how much pop we drink. A little bit once in a while is not bad, but if we drink too much pop too often, it can make us unhealthy, just like eating too much *mattaaq*. We hope that you have enjoyed our message today and thank you for listening.

0.01). Qualitative comments from the youth indicated a positive reaction to the elders' stories and a desire to learn more about TF and traditional ways. The assessment indicated that elders' storytelling in DVD format was a successful approach for transferring knowledge from elders to youth participating in the pilot assessment. The qualitative feedback was helpful in revising the DVD for future use and evaluation (Yohannes, 2009).

Youth radio drama

Objectives and methods

Radio drama with community youth was developed to help improve youth's nutrition and health knowledge and to enable them to make healthier food choices. Messages were designed to increase appreciation of TF and to target selected high-risk behaviours, such as the high consumption of carbonated beverages, which includes an average of 1 litre of pop per day. The messages were designed to link the themes of the elders' stories to modern nutritional advice involving healthy food choices, including market food choices.

The specific messages were developed by CINE (Cassandra Racicot), with advice from the community steering committee and youth. Before airing the dramas on local radio, youth were recruited for focus group tests of their messages, to ensure cultural relevance and acceptability. Box 9.1 gives an example of a radio drama that utilizes Inuit traditional knowledge through the elders' stories, youth dialogue and modern nutritional advice, with actors recruited from among community youth.

The radio drama pilot tests used key informant interviews and focus group discussions to ensure relevancy and acceptability. The results of a broader community-wide evaluation of the radio programmes, which were aired several times a week, were not yet available at time of writing. However, the approach holds promise for capturing youth's attention and engaging youth in building on the knowledge that already exists in the community, strengthening ties between youth and elders, and ensuring health promotion that is culturally relevant.

Food security, climate change and promotion of TF

> If ice doesn't form anymore, our traditional food system might disappear.
>
> *Elder Pauloosie Veevee, Pangnirtung, 24 June 2006*

During the elders' interviews, elders' observations of the impacts of climate change on local flora and fauna and their resulting concerns for food security were noted. A sample narrative is provided in Box 9.2, by Elder Pauloosie Veevee from Pangnirtung. The temperature has risen three times faster in the Arctic than elsewhere in the northern hemisphere, outpacing climate change predictions, reversing a 2 000-year cooling trend (Kaufman *et al.*, 2009) and substantiating earlier claims by the former President of the Inuit Circumpolar Conference, Sheila Watt-Cloutier, who stated that "the Arctic is the world's barometer of climate change. We are the early warning system for the world. What is happening to us now will happen to others further south in years to come" (Alaska Native Science Commission, 2005). As predicted (Haines and McMichael, 1997), extreme weather events are being noted. Given the melting of the pack ice in the Arctic (Stoll, 2006) and climate changes that are outpacing predictions (Kaufman *et al.*, 2009), it is imperative to evaluate potential impacts on TF and food security.

TF contributes significantly to nutrient intakes, even when consumed in small amounts (Kuhnlein and Receveur, 2007; Egeland *et al.*, 2011; Johnson-Down and Egeland, 2010). Thus, the effects of climate change on the availability of and access to TF species and on food safety could have significant impacts on nutrition status and food security in the Arctic.

There are various definitions of food security; the World Food Summit defined it as being present when "all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 1996). The prevalence of food insecurity is high in Inuit communities, with estimates from individual community surveys using the 18-item United States Department of Agriculture (USDA) module revealing prevalence of 40 percent in Kangiqsujuaq, Nunavik (INAC, 2004), 83 percent in Kugaaruk, Nunavut (INAC, 2003), and 88 percent in Igloolik, Nunavut (Ford and Berrang-Ford, 2009). Based on a three-item questionnaire, the prevalence of food insecurity in Nunavut, which has a predominantly Inuit population, was 56 percent, in contrast to 14.7 percent in southern provinces, 21 percent in the Yukon, and 28 percent in Northwest Territories (NWT) (Ledrou and Gervais, 2005). Some 69.6 percent of Inuit households with children aged three to five years were food-insecure (Egeland *et al.*, 2010).

Food security depends on the geography, economy and ecology of Inuit communities, which are in a dynamic state of change, with impacts on access to and utilization of both market food and TF resources. Geographical considerations relate to the remoteness of Arctic communities, which require market food to be flown, shipped or – in a few cases – transported by ice-roads in the winter, contributing to high food costs, especially for perishables, in Canadian Arctic communities (INAC, 2007). Geographical considerations also relate to the historical shift from small nomadic groups dispersed across the Arctic to larger settlements, which often results in the need to travel considerable distances to reach productive hunting areas.

Economic considerations relate to monetary access to market food, the costs of fuel and equipment, and the economic gains associated with harvesting and utilizing local species (Ford, 2009; Lambden *et al.*, 2006; Chan *et al.*, 2006). Food sharing networks are an important component of social support networks and should be considered when seeking to understand local economies. Local Inuit economies also rely largely on government or private sector service industry jobs, arts and crafts, tourism and, depending on the community, jobs related to resource extraction. Because the costs associated with hunting and harvesting are notable (Ford, 2009; Lambden *et al.*, 2006) and hunting requires time and flexibility, short-term, high-paying jobs are prized (Nuttall *et al.*, 2010). Hunting tourism can be a lucrative source of income for Inuit households, with foreign clients bringing in as much as CAD 15 000 per polar bear. In

Box 9.2

Elder Pauloosie Veevee reports on climate change in the Arctic

From my knowledge, climate change is most evident, with the ice conditions being affected most from how it used to be.

When digging for a seal hole on ice or to set nets, the ice is much softer today, whereas yesteryear, it used to make sounds when chiselled, when the ice was harder. Then, the ice used to be slightly softer than the lake ice. Today the sea ice is much softer. Even with the extreme cold temperatures, the ice conditions don't freeze up as hard; the ice is softer, like shortening. This has been occurring more recently.

If I can recall the year, I would be able to name it. As I am not too cognizant of time, the year is recent as of when the sea ice has softened.

Post-2000, that is when the sea ice conditions have changed. That is when that has occurred. The scattered water that used to be visible atop some ice doesn't occur as much now. In the spring, there used to be scattered water atop some ice. Today, water will overflow over the whole ice with minimal scattered water atop some ice. A lot of water overflows over the sea ice now, allowing for the sea ice to soften more quickly.

Before, the scattered water atop ice would have dust build-up along the edges, now that doesn't even occur. The sea ice doesn't pack as thick any longer. It will thicken but not in consistency. Before, the snow ice used to pack thick and build on to the land, and it would remain for longer periods of time. It occurs today but for a shorter time. Changes are very pertinent to the sea ice.

It is June, nearing the end of the month. We would be hunting for the infant seals with blizzards occurring at times. That is how it was back then by June. Although, it wasn't always like that. By June, the ice would break on the southerly winds.

The ice never broke off on its own. Now, the ice breaks up without any wind or with minimal wind. There was a word used to describe the southerly wind breaking off the ice, *nunningiarasuttuq*.

In *Paurngaturlik* (camp), that is how it used to be.

At times, the wind would break the ice in chunks and leave a channel of water. It was a perfect time to catch seals. The sea ice would ground into the sea bed at times in the Panniqtuuq Fiord. We would anchor where there were most seals at high tide. By high tide, we would take the dog-team while the sea ice seemed connected. Today, these don't occur anymore. The sea ice melts so rapidly. We used to wait for ships in the fall for they were our source of food rations. We had to paddle to return to our camps from trading. October was a hasty month to travel in, for the ice was forming and we had to return to our camps. At one time, we got caught when the ice formed by October, so we had to winter in Usualuk. Boating was impossible. October and November were the times the ice formed for the winter.

Today, the ice doesn't form until the Christmas month. The sea ice totally solidifies by January. At times, Christmas arrives when there is still water visible.

I haven't observed any drastic changes with the snow. The snow doesn't compact itself as hard as it used to. On the southerly wind, snow would form atop the snow, called *naannguat*, not snow-drifts. This type of snow shudders the skidoo as it's going. When the wind comes from the west, snow forms into *naannguat* now too. That is evidence of the snow formation change.

It is different today. I didn't construct many iglus [igloos] but I had to build them when hunting by dog-team, as that was the practice then. It is different today to build an iglu, for we have to search harder to find the appropriate snow. Even with the wind blowing, the snow doesn't harden as much today.

We hear of climate change occurring today. I have a slightly different perspective on climate change effects on the ice. My view is that the weather is not totally warmer, I think the change is evident through the seawater.

The seawater doesn't get as cold anymore, although it isn't changing by warmth as much either. It gets extremely cold outside still at times. I can see the changes, for we lived a nomadic lifestyle with dog-teams. Living harmoniously, we used whips with our dog-teams. In the spring, we would dunk our whips into the water as deep as we could and when we'd pull it out, the tip of the whip would freeze up. This is not common any longer.

I know very well that the wind has a more cyclone pattern today. I have noticed the changes in the wind over the past two years. In the summer of 2005, it was most evident. It was windy with barely any calm days. On the calming of wind, it would pick up from the other direction.

In our youthful days, when we were paddling, the days were calm for long. Now, we don't see that kind of days. The wind is more frequent now, with fewer calm days, and I don't know why that is so. The westerly wind always calms down by evening, always has and still does. At sunset, the day is calm but as the day picks up the wind begins to hustle.

We have a word that describes this, as we have dialectal differences, the word *saqijaal-latuinnaqtuq* is the term we use for when the wind begins to pick up from the other direction. This is very new, the wind picking up from the opposite direction, it never was like that before.

Times have changed. Then, the weather seemed to be cold for one whole season. The cold today is as sharp as a blade with an intensity to it. It'll be cold but it won't freeze up or thicken the ice as it used to. When we had cold seasons, the weather would freeze up the ice fully. Today, it is a sharp cold. The changes in the cold weather are evident.

I don't go hunting as frequently anymore, but I keep informed. We all have perspectives on things. As the ice break-up is earlier now, seals' fur is browner now. They don't have as much time to bask in the sun. When you are used to seeing the full colour of seal fur, it is regrettable to see them brown. The ice they bask on is no longer accessible, so they have less ice and sun time. Polar bears will have no more feed left with seals being speedier and

they get to places faster than the bears. I have thought of things I shouldn't even consider, that if ice doesn't form any more, our traditional food system might disappear. With the warming of the sea, we may have no more seals.

There have been some slight changes to the seal fur. It is evident if there is no more sea ice, as seals with the change of their fur colour go through a phase of dandruff release. Seals like to bask in the sun as they go through a colour change. But if there is no longer any ice left, seals will remain brown in the future.

I haven't noticed any effect on the meat. Seals rely on their food chain. I don't know when they have eaten something, their meat isn't as tender as it used to be. In the olden days, we used to leave the seal out for a day or two before butchering and then it would be so tender with the blood clotting a bit, they were so good. My thoughts are – as we have time to reflect on things when alone, although not all the time – in the year 2006, the seals were almost left with no time for birthing with the ice breakage being much earlier. Seals have birthing seasons in March and April. I feel if there is no natural habitat for the seals and their pups, the pups will die off. They will die off from cold. This almost occurred recently, barely stretching the luck. The seals always birth their pups within the snow.

There is so much noise pollution today, with boats roaming back and forth. Back in the day, there was barely any noise to disrupt the game. There is quite an abundance of seals still, they are just not as close to our homeland. As the game prefer solace, I feel they are keeping a distance.

There has been an abundance of change! Back then, the melted ice foliage remained. It would melt only when its time arrived. It would turn into water. Today, it melts even before its season arrives. I have no idea why that is. It is worrisome now for young hunters too, as ice breakage can appear to be melting ice when it is not.

I haven't noticed much change in the water currents. We have always sought for clams at low tide during full moon. I am not sure if this is a recent trend or whether it is common or not, the high tide will draw in high but the low tide doesn't extend as far as it used to. When full moon is drawing near, we always delightfully say, "umm, it'll be clam season soon". The water current is noticeable in that sense.

I haven't seen any changes in the waves. It's likely that others have observed them but I haven't seen any changes in the waves.

I noticed immense changes in the years 2005 and 2006, especially in 2006. It is as if the earth is in a rush. The plants have been turning green a lot earlier in the spring, even before their season has arrived for growth: our rare, earth's rare plants in the Arctic. I haven't noticed any foreign plants to date. But I have noticed that the plants green a lot sooner than they used to. The weather contributes to the growth of the plants. They wouldn't grow by themselves, the weather controls their growth.

There is an old saying among Inuit that if the snow melts earlier, the birds will nest their eggs earlier as well. On the other side of Cumberland Sound there is an abundance of birds that nest eggs. It is said the egg laying birds go with the cycle of summer. If the snow takes longer to melt, the birds will take longer to lay eggs. There hasn't been much change with this. It is more than likely that with snow melting sooner, the birds will lay eggs a lot sooner.

What is evident is the *sirmiit* [Inuktitut for "blue glaciers with melting ice"] that have running water throughout the winter are no longer here. There used to be *sirmiit*, and they would remain cold. They remained frozen. They melt now. Atop the mountains are glaciers. The ones that are not at the mountain top and have running water we call *sirmiit*.

I am not totally certain of how climate change has affected Inuit. But how I observe it is that Inuit easily get colds. It wasn't like that back then. People are more susceptible to colds now. I think with the varying physical demands, that may be a contributor. Or it's likely that the community is more populated and that could be the main contributor to the colds. Or the weather may be the factor to all the colds.

Safety is the top of the list today with being aware of the environment. We have always had to be cautious, but caution is required more today. Before, we always had to check the ice conditions with our hunting tools to avoid danger or accidents. Today, tools will be a necessity to check the ice conditions. We utilize the harpoons/tools to check the ice conditions. That was a requirement in our days. It'll be more of a prerequisite today, as climate change has big effects on the ice.

The last thing I'd like to say is, I am not praising myself, I am a seasoned elder having lived the times of dog-teaming. I am not getting any wiser. I have listened to many storytellings. I don't contribute to the storytellings. Although in interviews, I can provide some historical knowledge, I don't like to give second-hand knowledge. There isn't enough evidence in second-hand stories, so I prefer listening to first-hand stories. That is all I have to say. *Qujannamiik*.

Elder Pauloosie Veevee in an interview with Jonah Kilabuk, Pangnirtung, 24 June 2006

one year alone, the Baffin community of Clyde River earned CAD 212 000 from polar bear hunting tourism and most of this money went directly to Inuit households, which in turn purchased equipment to facilitate their own subsistence hunting as well as future hunting tourism (Nuttall *et al.*, 2010). Thus, although polar bear meat itself is not a major contributor to the diet (Kuhnlein and Soueida, 1992), threats to polar bear populations could have a profound effect on food security in the Arctic through reduced economic opportunities in tourism. Political lobbying regarding the banning of the sale of seal furs has already had devastating effects on the

economy of Inuit communities, as seal furs represented a significant source of revenue (Carino, 2009). Thus, changes in the availability of subsistence species and in market-place policies can have profound economic effects on isolated communities with limited options for income generation, and serve as examples of the diverse ways in which decreased availability or utilization of TF species can threaten food security.

The food chain involves exposure to a variety of threats, including viruses, bacteria, biotoxins and parasitic pathogens found in subsistence species and other foods (Parkinson and Evengård, 2009; Hotez, 2010; Van Dolah, 2000); lead-shot micro-fragments and dissolved lead in game meats, particularly fowl (AMAP, 2009; Dewailly *et al.*, 2000); and trace metals and persistent organic pollutants, which are atmospherically transported to the Arctic and biomagnified in the food chain (AMAP, 2009). Surveillance and targeted interventions that support the consumption of TF while reducing exposure to harmful agents include community education to eliminate the use of modern air-tight containers and bags when fermenting and storing TF, to prevent botulism (McLaughlin *et al.*, 2004); the banning of lead-shot in Quebec, which has resulted in blood lead levels decreasing by a half (Dewailly *et al.*, 2007a; 2001); and *Trichinella larvae* testing of meat prior to community consumption (Proulx *et al.*, 2002). Biomonitoring indicates that exposure to methylmercury and persistent organic pollutants has declined, owing in part to reductions in environmental levels and in consumption of TF (AMAP, 2009). However, because the effects of contaminant levels observed in the Arctic are subtle and there are many competing benefits to eating TF (Egeland and Middaugh, 1997; Dewailly *et al.*, 2002; 2007b; Jacobson *et al.*, 2008; Kuhnlein *et al.*, 2002; Mozaffarian and Rimm, 2006), a review of the full scope of evidence led the Arctic Monitoring and Assessment Program (AMAP) to advocate for continuing the consumption of TF in the Arctic (AMAP, 2009).

However, there is evidence that climate change and related impacts can alter food safety in the Arctic. Water warming increases biotoxins, such as *Saxitoxin*, and the presence of pathogenic bacteria, such as *Vibrio parahemolyticus*, with respective consequences for paralytic shellfish poisoning (Van Dolah, 2000) and increased risk of bacterial-related food-borne illness (McLaughlin *et al.*, 2005). Floods, erosion and the thawing of permafrost can threaten community sanitation infrastructure, resulting in release of pathogens into the environment, and floods and erosion can increase distant agricultural pesticide runoff into streams and tributaries that ultimately reach the Arctic. Higher global temperatures would increase the volatization of contaminants, resulting in increased transport and deposition of contaminants in the Arctic (Kraemer, Berner and Furgal, 2005). Floods and erosion would increase inorganic mercury in water, and water warming would increase the methylation of inorganic mercury and, over time, the methylmercury burdens in subsistence species (Booth and Zeller, 2005). These are only a few of the numerous pathways by which climate change may alter food safety in the Arctic (Parkinson and Evengård, 2009; Kraemer, Berner and Furgal, 2005). Inuit also mention that the heavy use of tranquilizers for research in the Arctic has made polar bear meat inedible. Whereas Elder Jamesie Mike reported that frozen polar bear meat was edible 60 years ago, today polar bear meat must be cooked for hours to rid it of toxins (KP Studios, 2009).

In addition to potential impacts on food chain safety, climate change is having effects on Arctic ecosystems, with implications – which are not yet fully understood – for access to and availability of subsistence species that are important for food security. Climate change can alter access to TF species, as travel to hunting areas requires navigation, often of considerable distances over rough terrain, streams and inlets, and is safer when the landscape is frozen. Extreme weather conditions also represent threats to navigation and safety, with further implications for hunters' access to subsistence species (Krupnik and Jolly, 2002; Furgal, Martin and Gosselin, 2002; Ford, 2009; Ford and Berrang-Ford, 2009; Ford and Pearce, 2010; Guyot *et al.*, 2006).

Climate changes thus affect TF species; the Arctic has already witnessed the encroachment of non-Arctic flora and fauna species due to these changes (Simmonds and Isaac, 2007; Meier, Döscher and Halkka, 2004; Ferguson, Stirling and McLoughlin, 2005; Humphries,

Umbanhowar and McCann, 2004; Vors and Boyce, 2009). Although there have always been fluctuations in caribou populations over time, the decline now being noted (Vors and Boyce, 2009) is particularly important given the heavy reliance on caribou meat in the Canadian Arctic (Johnson-Down and Egeland, 2010; Kuhnlein and Receveur, 2007; Kuhnlein and Soueida, 1992). In addition to the scientific literature, communities too have reported that caribou have been scarce in the last couple of years, with migration routes considered to be off the usual ones taken. Given the historical fluctuations in herds and migration routes, elders state that the caribou will return to their usual migration path in time (L. Okalik, personal communication, 2010).

There is also evidence that early ice melt and reduced snow fall and snow thickness have an impact on populations of ringed seal (*Phoca hispida*) pups in Western Hudson Bay, and are projected to continue to diminish the species (Ferguson, Stirling and McLoughlin, 2005). The lack of ice floes in eastern Canada resulted in the deaths of thousands of harp seal (*Phoca groenlandica*) pups in 2007, and a similar occurrence was reported in 2002, when the Department of Fisheries and Oceans estimated that 75 percent of seal pups in the Gulf of Lawrence died coincident with a year of very little ice (MacKenzie, 2007). With the ongoing shrinkage of pack ice in the Arctic, seal populations will likely be greatly threatened. In addition, although current data are contradictory regarding whether polar bear (*Ursus maritimus*) populations are diminishing or in abundance (Aars, Lunn and Derocher, 2006; Dowsley and Wenzel, 2008), polar bears rely heavily on seals for their sustenance, raising concerns for the bears' propagation and survival if seal populations diminish. As caribou, seal and polar bear are a central component of the TF system and economy, the changes are potentially important for Inuit food security.

Inuit have historically been highly adaptive to changes in their environment, but current constraints in adaptive capacity have been noted (Nuttall *et al.*, 2010; Ford, Smit and Wandel, 2006; Ford and Pearce, 2010). Given that Canada's Action Plan for Food Security (Agriculture and Agri-Food Canada, 1998) listed TF acquisition as one of its ten priorities for dealing with food insecurity, understanding the impact that continued climate change will have on food insecurity should be a high-priority research area.

As traditional knowledge and strong social support networks have been listed as factors contributing to the adaptive capacity of Inuit communities (Ford *et al.*, 2006), elders' storytelling may be one of many strategies communities can utilize to help meet the challenges of climate change. Elders' storytelling regarding their knowledge of a full range of TF species and parts of species may be a means of enhancing youth's skills in and knowledge and acceptance of hunting and harvesting a wide range of subsistence species and utilizing diverse parts of species, and could be one of the much-needed strategies for building resiliency in a time of uncertainty and rapid climate change.

Summary

With caribou, seal and polar bear populations potentially in peril (three mainstays of the Inuit TF system and economy), the promotion of a wide range of TF is needed to build adaptive capacity in Inuit communities.

This case study reports on the development of innovative nutritional health promotion in Pangnirtung, where health promotion messages built on existing knowledge and cultural conceptualizations of health and well-being through Inuit elders' traditional knowledge combined with two culturally relevant modes of communication: community radio and storytelling. The intervention engaged youth by involving them in developing and testing messages prior to airing on community radio, and in conducting the radio programmes. The health promotion programme was developed in partnership with the community, and its main elements came directly from community steering committee members. Health promotion programmes developed locally are likely to be more acceptable, relevant and, ultimately, successful than programmes that are imported from non-Inuit communities. At time of writing, the results of a post-survey community-wide evaluation of youth and young adults were not yet known, but the community-CINE model developed in Pangnirtung holds promise

for helping to prevent the negative consequences of acculturation and nutrition transition, and could be adapted to other indigenous communities in Canada and globally.

Storytelling also revealed elders' observations of climate change and its impacts on local flora and fauna, and the elders' resulting concerns for food security. As food security is a fundamental component of a population's health, this chapter has highlighted the economic and ecological context of food insecurity in Inuit communities. While the true impact of climate change is not yet known, enough information exists to suggest that research in this area should be a high priority. Given that climate changes are outpacing projections, health promotion programmes need to take into account the broader and likely future realities that will challenge Arctic communities.

Conclusion

The pace of change "has been breath-taking and has few parallels in the developed world" (Inuit Tapiriit Kanatami President, Mary Simon) (Simon, 2009).

Clearly, changes in the Arctic ecosystem are happening rapidly, and current changes follow the recent 60-year history of a rapid transition from nomadic life to the establishment of settlements throughout the Canadian Arctic, and the ensuing ratification of four land claim agreements (Egeland *et al.*, 2009). The ongoing changes will not stop with the loss of pack ice, as this will usher in an era of Arctic exploration and development projects to extract the vast wealth the Arctic holds (Yalowitz, Collins and Virginia, 2008). As the Northwest Passage becomes commonly used for international shipping and transportation, the effects on water and noise pollution will further disrupt game and their migratory paths.

It is worth pausing to consider the implications of the coming changes for Inuit communities, which are already strained by an unprecedented pace of change and unresolved social justice issues of poverty, household crowding, low educational attainment, lack of opportunities, and disparities in health and longevity (Egeland, Faraj and Osborne, 2010; Veugelers, Yip and Mq, 2001; Wilkins *et al.*, 2008; Standing Committee on Aboriginal Affairs and Northern Development, 2007). For Indigenous Peoples, cultural and environmental dispossession are among the top determinants of poor health (Richmond and Ross, 2009).

Efforts are needed on multiple fronts to promote Inuit health and resiliency and Arctic ecosystem sustainability. In the context of rapid changes, storytelling with elders is important in building knowledge of the past that may otherwise be lost to future generations. Firm roots in this knowledge and in elders' wisdom will help strengthen social cohesion and support, which is recognized as having beneficial associations with health and well-being (Richmond, Ross and Egeland, 2007). Strengthening the ties between elders and youth may also have other benefits in a time of rapid changes that are affecting all dimensions of life in the Arctic. Elders' storytelling that links to modern-day nutritional issues and uses modern media may be a means of reaching youth, building social cohesion, and promoting Inuit resiliency and adaptive capacity in a time of great uncertainty and rapid changes.

As Inuit Tapiriit Kanatami President Mary Simon stated, "with focused and responsible efforts we can harness the enormous potential of our youth and direct it towards a positive outcome" (Simon, 2009)

Acknowledgements

The authors would like to acknowledge the financial support of Canadian Institutes of Health Research, the Social Sciences and Humanities Research Council of Canada, and the Max Bell Foundation. They also acknowledge the sage advice of the Inuit Tapiriit Kanatami, the elders of Panniqtuuq, the Hamlet of Pangnirtung, the Health Centre, the Government of Nunavut, Nunavut Tunngavik Inc., and the Nunavummi Qaujisaqtulirijikkut (Nunavut Research Institute). Finally, they appreciate all the help provided by community members, especially Mary Ann Mike, O. Nashalik, J. Alivaktuk, B. Akpalialuk, J. Akpalialuk, J. Alivaktuk, D. Inshulutak, M. Qumuatuq, M. Shoapik, P. Qiyuaqjuk, P. Kilabuk, L. Nauyuk, J. Qaqasiq, T. Kunilusie, R. Akulukjuk, G. Akulukjuk, T. Kunilusie, and T. Metuk.

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Annex 9.1 Traditional foods included in the traditional FFQ, Pangnirtung, Baffin Region, Nunavut, 2006

Marine mammals

- Beluga meat (fresh, cooked, frozen)
- Beluga meat (dried)
- Beluga *mattaaq* with blubber (raw or boiled)
- Beluga *mattaaq* without blubber
- Beluga blubber (raw or cooked)
- Beluga oil
- Narwhal blubber (raw or cooked)
- Narwhal *mattaaq* with blubber (raw or boiled)
- Narwhal *mattaaq* without blubber (raw or boiled)
- Ringed seal blubber (raw or boiled)
- Ringed seal liver (raw or cooked)
- Ringed seal meat (raw, cooked or frozen)
- Walrus blubber
- Walrus meat

Fish and seafood

- Arctic char
- Halibut
- Turbot
- Mussels
- Clams
- Shrimp

Land mammals

- Caribou meat (raw, frozen, baked, cooked and aged)
- Caribou meat (dried)
- Caribou liver
- Caribou heart (raw, boiled)
- Caribou kidney
- Caribou tongue (raw, cooked)
- Caribou stomach (walls and content)
- Polar bear meat (raw, boiled)
- Rabbit meat

Game birds

- Ptarmigan
- Canada goose
- Eider duck
- Eggs of goose or duck

Plants and berries

- Blueberries, crowberries, cranberries, other picked berries
- Sour leaves
- Welk (seaweed)
- Other flowers and plants (please specify)
- Other (specify)