

Challenges in assessing food environments in northern and remote communities in Canada

Kelly Skinner, PhD,¹ Kristin Burnett, PhD,² Patricia Williams, PhD, PDt,³ Debbie Martin, PhD,⁴ Christopher Stothart, PDt,⁵ Joseph LeBlanc, PhD,⁶ Gigi Veerarahavan, BA,⁷ Amanda Sheedy, MPH⁸

ABSTRACT

Effective tools for retail food environments in northern and remote communities are lacking. This paper examines the challenges of conducting food environment assessments in northern and remote communities in Canada encountered during our experience with a food costing project. One of the goals of the *Paying for Nutrition in the North* project is to develop guidelines to improve current food costing tools for northern Canada. *Paying for Nutrition* illustrates the complex context of measuring food environments in northern and remote communities. Through the development of a food costing methodology guide to assess northern food environments, several contextual issues emerged, including retail store oligopolies in communities; the importance of assessing food quality; informal social food economies; and the challenge of costing the acquisition and consumption of land- and water-based foods. Food environment measures designed for northern and remote communities need to reflect the geographic context in which they are being employed and must include input from local residents.

KEY WORDS: First Nations; food supply; cost analysis; rural population

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A recent report on measuring food environments in Canada has identified a significant research gap regarding information about retail food environments in northern and remote communities; food assessment tools relevant for the northern context are lacking.¹ In this commentary, we outline our experiences in carrying out the *Paying for Nutrition in the North* project in order to examine the challenges and considerations for food environment assessment in northern and remote communities in Canada. We begin by describing two food costing tools that are most commonly used in northern and southern Canada, include some details about the *Paying for Nutrition* project and briefly explain the context of the northern food environment. The paper then examines the challenges and contextual issues we encountered in the process of developing a food costing methodology guide for northern Canada, specifically the provincial norths, and some of the factors that must be considered in further developing appropriate assessment tools for food environments in the provincial norths.

Common food costing tools in Canada

Current food costing studies in southern and urban environments rely on the National Nutritious Food Basket (NNFB), which is a “survey tool that is a measure of the cost of basic healthy eating that represents current nutrition recommendations and average food purchasing patterns”.² The NNFB is a list of 67 food items and is used to cost the lowest priced items available. Data collection is conducted with a minimum of six stores surveyed, and the average cost of each food item in the basket is calculated across all stores sampled. When five or more items are not available in an individual store, that store is usually not included in the average.

The Revised Northern Food Basket (RNFB) is the tool that Indigenous and Northern Affairs Canada uses to monitor “trends in the cost of healthy eating in isolated northern communities eligible for the Nutrition North Canada (NNC) program”.³ The RNFB was revised in 2007 to ensure that it was consistent with the newest version of Canada’s Food Guide and the Aboriginal version of the Food Guide.⁴ In comparison with the NNFB, the RNFB differs in a number of respects: it is intended to be more consistent with current food consumption patterns of northern residents (e.g., meat and non-perishable foods account for a relatively larger percentage and fresh fruit and vegetables a relatively smaller proportion of the basket), and it uses average prices for each product in the basket rather than the lowest price available in the community.^{3,4} Neither the NNFB nor the RNFB considers the costs of land- or water-based food acquisition. Because of the differences in the items in the NNFB and the RNFB it is not possible to compare them with each other, thus complicating direct

Author Affiliations

1. School of Public Health and Health Systems, University of Waterloo, Waterloo, ON
2. Department of Indigenous Learning, Lakehead University, Thunder Bay, ON
3. Department of Applied Human Nutrition, Mount Saint Vincent University, Halifax, NS
4. School of Health and Human Performance, Dalhousie University, Halifax, NS
5. Centre for Population Health Sciences, University of Edinburgh, Edinburgh, UK
6. Social Planning Council of Sudbury, Sudbury, ON
7. Peetabeck Health Services, Fort Albany, ON
8. Food Secure Canada, Montreal, QC

Correspondence: Kelly Skinner, PhD, School of Public Health and Health Systems, University of Waterloo, 200 University Avenue West, Waterloo, ON N2L 3G1, Tel: 519-888-4567, ext. 38164, E-mail: kskinner@uwaterloo.ca

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comparisons between the costs of food currently collected in northern and southern Canada.

The *Paying for Nutrition* project

The initial goals of the *Paying for Nutrition* project were to 1) improve upon current food costing tools (i.e., the NNFB) for northern Canada and determine the comparability of data across regions; 2) compare the cost of living (affordability) of the NNFB and food prices between two different regions of Canada (subsequent discussions with the stakeholders involved determined that direct comparisons across regions were not appropriate); 3) strengthen the work of the Northern and Remote Food Network through a Community of Practice (CoP – see description below) on food costing in the north and report on the cost of food in the north to support advocacy efforts; and 4) apply and promote participatory food costing methods where feasible. This commentary reports on the first goal of the project, describes our challenges in improving food costing tools for northern and remote locations, and makes suggestions for further developing these tools.

The project is a community/academic partnership between Food Secure Canada and two university-based research management teams (RMT): one in Halifax, NS, (Food Action Research Centre [FoodARC] out of Mount Saint Vincent University) ($n=5$) and one in Thunder Bay, ON, (Lakehead University) ($n=2$); a Research Advisory Team (RAT) ($n=5$) provides oversight. The RAT is made up of key academics and organizations with the role of overseeing and advising on the methodology of the project. The northern and remote communities involved in our project are located in the provincial north, specifically northern Ontario, and the northern RMT includes a project coordinator from one of these communities. Other northern community members ($n=5$) were also trained to conduct food costing.

In addition to the RMT and RAT, Food Secure Canada formed a Community of Practice (CoP). The CoP is a mixed group of food costing practitioners made up of community members, service providers and academics. The project supports CoP meetings by teleconference about once a month; the discussions on these calls are used to inform the RMT and the RAT. Fifty people signed up for the CoP, and approximately 12–15 people have participated in each of the six CoP calls to date. The topics of each call are determined by the project coordinator in consultation with the RMT. In particular, the CoP has been instrumental in identifying the limitations of the existing food costing methodology as well as the importance of including land- and water-based food acquisition during the development of the food costing methodology guide.

Food environments in the provincial North

Communities located in the provincial North that are only accessible by plane or seasonally by winter ice roads have different food environments than those of urban and southern locations. These households generally rely on two co-existing food systems to sustain themselves: the land-based forest and freshwater food harvesting system and the market-based retail food purchasing system. Typically, these communities only have one major retailer, which provides the majority of goods and services in the community (i.e., food, gas, pharmacy, financial services, fast

food and, increasingly, health care services). The northern communities included in the *Paying for Nutrition* project are specifically First Nations communities in northern Ontario. We acknowledge that there is great diversity among communities across the country.

Developing the methodology guide

Drafting the food costing methodology guide was the responsibility of the project coordinator, in consultation with RMT members and drawing from the FoodARC participatory food costing methodology used in Nova Scotia.⁵ Producing a methodology guide that reflects both the unique environments of northern First Nations as well as the diversity of food acquisition experiences and varied community contexts in northern Ontario has posed significant challenges.

During the development of the guide, two of the key challenges that arose from discussions among the CoP, the RAT and the RMT were 1) how to measure the cost of harvested land- and water-based food and 2) how to measure food quality. Other contextual issues that emerged were the existence of retail store oligopolies in communities and the importance of informal social food economies. There were also challenges using participatory approaches across southern and northern contexts. For example, the approach to data collection has been different in Nova Scotia, where permission was obtained from grocery stores to record prices, whereas in northern Ontario, instead of obtaining permission from the store, all food items on the RNFB list were purchased and the receipts used as data.

Retail Store Oligopolies

An oligopoly is a state of limited competition in which the market is shared by only a few producers or sellers. In the process of collaborating on this project it has become very clear that generating one costing model is extremely challenging given the diversity of food environment contexts across northern Ontario and in comparison with Nova Scotia. For example, while some northern communities may have only one or two retailers, others have none. Therefore, any food assessment in such a community needs to account for the cost of travel to the nearest food retail outlet outside of the community. Determining these costs is further complicated because modes of travel can change, depending upon the time of year. For instance, during the winter, snow/ice roads allow access between northern communities that is impossible without planes or boats during the rest of the year. Often the major and only retailer in the provincial North is the North West Company (the Northern Store) or one of its subsidiaries. Without a competitive market there is very little incentive for stores to offer lower prices. Some of the communities we worked with in northern Ontario, in addition to a large corporate retailer, have a locally owned store. However, the goods and services offered at these locally owned stores vary widely, some providing a full range of goods and services, and others serving as a convenience store with limited fresh food options.

Measuring Food Quality

Considering the long supply chain that food must travel to reach northern communities, the quality of fresh and perishable foods is extremely variable. There is also no accountability for food

Table 1. Assessing/measuring food quality

Packaging – Is the package in good condition (e.g., not broken, dented, ripped, leaking)?	YES	NO
If no, describe:		
Labeling – Is the food item labeled correctly?	YES	NO
If no, describe:		
Temperature – Was the food item held at the correct temperature (e.g., frozen, refrigerated)?	YES	NO
If no, describe:		
Freshness of the product – Is the item past its best-before date?	YES	NO
How would you rate the freshness of this product?	0 – Very poor freshness 1 – Poor freshness 2 – Fair freshness 3 – Good freshness 4 – Very good freshness	
If 0–3, please describe (e.g., smell, appearance, feel):		

Table 2. Hunting/fishing items survey tool

Item	Purchase size	Price	On sale	Comments and calculations
Gasoline	1 L		N/A	
Snare wire, 20 gauge, brass	20 feet		<input type="checkbox"/> Yes	Regular price: \$ _____ <input type="checkbox"/> No
Fishing net (gill net)	100 feet		<input type="checkbox"/> Yes	Regular price: \$ _____ <input type="checkbox"/> No
Fishing line, 50 lb strength	120 yards (360 feet)		<input type="checkbox"/> Yes	Regular price: \$ _____ <input type="checkbox"/> No
Shotgun ammunition, 12 gauge	25 cartridges, box		<input type="checkbox"/> Yes	Regular price: \$ _____ <input type="checkbox"/> No

quality in northern stores. For example, fresh foods like fruits and vegetables are sometimes packaged in such a way that it is impossible to assess their freshness/quality before purchase and home inspection. Foods are frequently sold past their best-before dates, show visible signs of mould, have been refrozen or have damaged packaging.⁶ The CoP and RMT discussed how to assess food quality. One option was to take photographs from a select list of foods and assess them according to a four-point “quality” scale, designed by the RMT from literature sources and including packaging, labeling, temperature and freshness (see Table 1).

Cost of Land- and Water-based Foods

There is no definitive methodology for costing land- and water-based foods. A study in Wapekeka and Kasabonika First Nations relied on detailed logs generated by active harvesters and estimated the annual cost of hunting at approximately \$25,000 with the

average cost of harvested meat at \$14 per kilogram.⁷ However, this kind of detailed information is extremely difficult to obtain, and the experiences of these two communities and the hunters involved in the study are not necessarily generalizable to other communities. Although the CoP and RMT initiated discussions about how to measure the cost of harvested land- and water-based foods, and a list of harvesting items (Table 2) have been costed during this project, the items included in a more broadly relevant assessment tool would need to better reflect the diversity of local and regional harvesting practices.

Informal Social Food Economies

Food sharing is an integral part of Aboriginal culture and traditions, and has been documented widely in the literature.^{8–11} The First Nations Regional Health Survey⁸ found that nearly 9 of 10 respondents (85.5%) had had traditional food shared with their household in the year leading up to the survey. Recent work from Nova Scotia on how people from both rural and urban contexts engage in the informal food economy,^{5,12} along with our work on this project, suggests that informal social food economies are another important aspect of food environments in northern Canada and other contexts that is not captured by current food costing methods and needs to be addressed.

CONCLUSION

While this paper has focused on food environments in northern Ontario, similarities can be drawn with food environments in other remote and northern communities elsewhere in Canada. Effective standardized tools that accurately measure consumer food environments should reflect the geographic and demographic context in which they are being employed, and would benefit from the involvement of a community of practice and participatory and collaborative approaches that include input from local residents.^{5,13} Current assessments are not meeting the needs of such communities. Further attention and investment needs to be given to establishing better methodologies of assessing food systems, particularly retail food environments, in northern and remote areas of Canada.

REFERENCES

1. Minaker L. *Measuring the Food Environment in Canada*. Ottawa, ON: Health Canada, 2013.
2. Standards, Programs, and Community Development Branch. *Nutritious Food Basket Guidance Document*. Ottawa, ON: Ministry of Health Promotion, 2010.
3. Government of Canada. Fact Sheet: Revised Northern Food Basket. Nutrition North Canada, 2013. Available at: <http://www.nutritionnorthcanada.gc.ca/eng/1369314079798/1369314090524> (Accessed September 30, 2015).
4. Indian Affairs and Northern Development. The Revised Northern Food Basket. Ottawa, ON: INAC, 2007. Available at: http://publications.gc.ca/collections/collection_2008/inac-ainc/R3-56-2007E.pdf (Accessed September 30, 2015).
5. Food Action Research Centre (FoodARC), Nova Scotia Food Security Network (NSFSN) and Collaborating Family Resource Centres/Projects. *What Does it Cost to Eat Healthy in Your Community? A Training Guide to Participatory Food Costing*. Halifax, NS: Mount Saint Vincent University, 2014.
6. Burnett K, Skinner K, LeBlanc J. From Food Mail to Nutrition North Canada: Reconsidering federal food subsidy programs for Northern Ontario. *Can Food Stud* 2015;2(1):141–56. doi: 10.15353/cfs-rcea.v2i1.62.
7. Pal S, Haman F, Robidoux M. The costs of local food procurement in two Northern Indigenous communities in Canada. *Food Foodways* 2013; 21(2):132–52. doi: 10.1080/07409710.2013.792193.
8. First Nations Information Governance Centre (FNIGC). *First Nations Regional Health Survey (RHS). Phase 2 (2008/10) National Report on Adults, Youth and Children Living in First Nations Communities*. Ottawa, ON: The First Nations Information Governance Centre, 2012.

9. Robidoux MA, Haman F, Sethna C. The relationship of the burbot (*Lota lota* L.) to the reintroduction of off-the-land foods in the Sandy Lake First Nation Community. *Biodemography Soc Biol* 2009;55:12–29. PMID: 19835098. doi: 10.1080/19485560903054630.
10. Skinner K, Hanning RM, Desjardins E, Tsuji LJS. Giving voice to food insecurity in a remote indigenous community in sub-arctic Ontario, Canada: Traditional ways, ways to cope, ways forward. *BMC Public Health* 2013;13:427. PMID: 23639143. doi: 10.1186/1471-2458-13-427.
11. Socha T, Zahaf M, Chambers L, Abraham R, Fiddler T. Food security in a northern First Nations community: An exploratory study on food availability and accessibility. *J Aborig Health* 2012;8(2):5–14. Available at: http://www.naho.ca/jah/english/jah08_02/08_02_food-security.pdf.
12. Knezevic I. Illicit food: Canadian food safety regulation and informal food economy. *Crit Pol Stud* 2015. doi: 10.1080/19460171.2015.1102750.
13. Williams PL, Amero M, Anderson B, Gillis D, Green-LaPierre R, Johnson C, et al. A participatory food costing model in Nova Scotia. *Can J Diet Pract Res* 2012;73(4):181–88. PMID: 23217445. doi: 10.3148/73.4.2012.181.

RÉSUMÉ

On manque d'outils efficaces pour analyser les environnements alimentaires au détail dans les communautés nordiques et éloignées. Nous examinons les difficultés de mener des évaluations de l'environnement alimentaire

dans ce type de communautés au Canada d'après notre expérience dans le cadre d'un projet de calcul des coûts des aliments. L'un des objectifs du projet *Paying for Nutrition in the North* est d'élaborer des lignes directrices afin d'améliorer les outils actuels de calcul des coûts des aliments dans le Nord du Canada. *Paying for Nutrition* illustre la complexité du contexte de mesure des environnements alimentaires dans les communautés nordiques et éloignées. Durant l'élaboration d'un guide méthodologique de calcul des coûts des aliments pour évaluer les environnements alimentaires nordiques, plusieurs problèmes contextuels se sont posés, dont la présence d'oligopoles de magasins de vente au détail dans ces communautés; l'importance d'évaluer la qualité des aliments; les économies sociales informelles de l'alimentation; et la difficulté de calculer les coûts d'acquisition et de consommation d'aliments de la terre et des cours d'eau. Les indicateurs de l'environnement alimentaire conçus pour les communautés nordiques et éloignées doivent refléter le contexte géographique où ils sont employés et doivent inclure la participation des résidents.

MOTS CLÉS : Premières Nations; approvisionnement en nourriture; analyse des coûts; population rurale