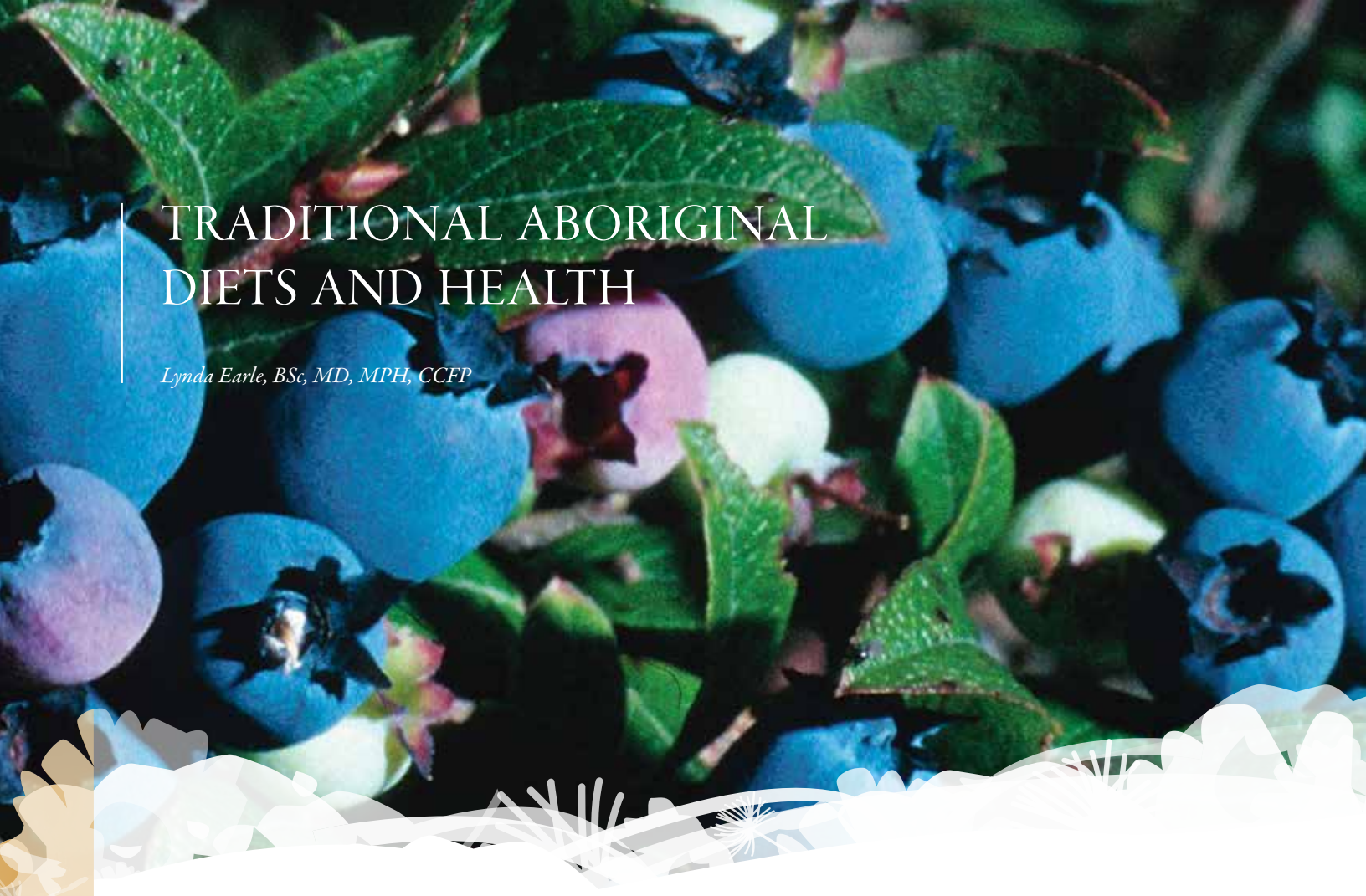

TRADITIONAL ABORIGINAL DIETS AND HEALTH

Lynda Earle, BSc, MD, MPH, CCFP

SOCIAL DETERMINANTS OF HEALTH

Unhealthy diets and physical inactivity have been identified as two of the three most important modifiable risk factors for the development of chronic disease.[1] Aboriginal* peoples in Canada have undergone a significant nutritional transition whereby traditional diets and associated physical activities have been replaced with patterns of consumption that increase the risk of developing chronic disease. Understanding this transition, and the benefits associated with traditional diets, is important for developing interventions to prevent chronic disease in Aboriginal communities.

Diet and Chronic Disease

The increasing burden of chronic disease worldwide is associated with changing dietary and lifestyle practices, including a decline in physical activity and an increase in high-fat, energy-dense diets.[2] There is good evidence that specific dietary and lifestyle factors may increase or decrease the risk of chronic disease. The risk of cardiovascular disease is increased by trans fatty acids, high sodium and alcohol intake, and obesity; while the risk is decreased by regular physical activity, omega-3 fatty acids, vegetables and fruits, and low to moderate alcohol intake.[3] The risk of type II diabetes is increased by saturated fats, overweight and obesity, and inactivity; and the development of specific cancers is related to risks such as certain preserved foods and alcohol, in contrast to the protective effects offered by fruits, vegetables and physical activity.[4]

Efforts to address chronic disease must target diet, nutrition and physical activity as a whole rather than in part, given the complex and interrelated metabolic and behavioural mechanisms involved.[5] However, due to the breadth of the subject, the scope of this review remains

NATIONAL COLLABORATING CENTRE FOR ABORIGINAL HEALTH
CENTRE DE COLLABORATION NATIONALE DE LA SANTÉ AUTOCHTONE

* Aboriginal' throughout this fact sheet refers collectively to the Indigenous inhabitants of Canada, including First Nations, Inuit and Métis peoples (as stated in Section 35(2) of the *Constitution Act*, 1982).

primarily on diet and nutritional issues. The review examines current consumption patterns in Aboriginal communities and explores the health benefits associated with traditional diets. It considers the challenges of promoting traditional dietary practices as well as the ways this has been supported in Aboriginal communities. English language articles were retrieved from both peer-reviewed and grey literature sources through a variety of methods including the use of scholarly databases, reference list reviews and web-based searches. The focus was on articles discussing the traditional foods and diets of Indigenous populations, especially North American Aboriginal peoples.

Diet and Nutrition in Aboriginal Communities

Traditional Aboriginal foods are those that originate from local plant or animal resources through gathering or harvesting, and which possess cultural meaning as a traditional food.[6] As such, traditional foods and nutrient intakes vary by local geography,[7] seasonality,[8] and cultural group.[9] In general, however, historical Aboriginal diets comprised of traditional foods were high in animal protein, nutrient-rich, and low in fat or high in marine sources of fat.[10] The energy spent in obtaining traditional foods was significant given the very physical demands of hunting, fishing, trapping, growing and gathering.[11]

A well recognized transition has occurred among Aboriginal peoples, with historic consumption patterns replaced by diets high in fat and sugar, combined with a more sedentary lifestyle.[12] The amount of traditional food consumed has declined over time,[13] coincident with food system changes including the introduction of western foods, loss of sustaining environmental resources, and the development of dependence on market foods.[14] Current dietary surveys among Aboriginal groups including First Nations, American Indian and Alaska Native peoples reveal that often diets are poor and do not meet dietary recommendations for saturated fat, fiber, sodium and fruits and vegetables.[15] Poor dietary patterns also occur among Aboriginal children, who consume snack foods frequently and less than the recommended servings of milk, fruits and vegetables.[16] Risk of specific dietary deficiencies have been identified in some Aboriginal populations including low intakes of zinc, calcium and vitamin D among Cree schoolchildren,[17] and low intakes of magnesium, folate and vitamins A, C, and E among the women of forty-seven Yukon First Nation, Dene, Métis and Inuit communities in the Canadian Arctic.[18]

The degree to which market-based diets are relied upon by Aboriginal peoples varies considerably, with intake of nutrients, market and traditional foods affected by regional and socio-demographic factors. Data from the United States suggest the dietary intake of Aboriginal peoples with diabetes does not differ significantly from the general diabetic population.[19] Food consumption patterns among Mi'kmaq children living on-reserve in Prince Edward Island are similar to the general

school-aged population in this province, with traditional foods being consumed infrequently.[20] Similar to non-Aboriginal peoples, food sources may be determined by poverty and rurality for Aboriginal peoples living off-reserve,[21] while factors such as remoteness and on-reserve living may affect food patterns in other regions.[22]

In contrast, some groups are more likely to consume traditional or country foods. Elders and older Aboriginal people consume more traditional foods than younger people.[23] In the Canadian Arctic, approximately 10-36% of energy is obtained from traditional sources,[24] and for a third of the James Bay Cree people, hunting and trapping remains a way of life.[25]

Traditional Aboriginal Diets and Their Benefits

Traditionally, Aboriginal diets and consumption patterns arose from complex and holistic food systems that provided health benefits beyond nutrition.[26]

Culture, a determinant of health,[27] is intricately tied to traditional Aboriginal foods. Not only are traditional foods valued from cultural, spiritual and health perspectives,[28] but the activities involved in their acquisition and distribution allow for the practice of cultural values such as sharing and cooperation.[29] Among Alaska Native peoples, traditional food consumption is associated with other measures of culture such as speaking a Native language, using traditional medicine and participating in traditional events.[30]

At the community level, traditional food systems may contribute to health via other economic and social pathways such as forming the basis of non-cash economies.[31] Additionally, the activities related to traditional food systems also confer health benefits through increased physical activity. It has been estimated that Innu people engaged in traditional activities related to hunting, gathering and trapping in the country expend between 12.5 to 50 megajoules (MJ) of energy per day compared to the 0.8-2.1 MJ exerted when residing in the village.[32]

It may be impossible or even undesirable to define the complex nutritional benefits of traditional foods separately from the health benefits of traditional food systems. However, emerging information suggests that traditional diets are able to supply a healthier pattern of fats and a greater amount of vitamins and minerals than Aboriginal peoples' current consumption patterns.

There is convincing evidence that the omega-3 fatty acids DHA and EHA found in fish and fish oils decrease the risk of cardiovascular disease.[33] Numerous studies have demonstrated that traditional diets are rich in sources of omega-3 fatty acids, particularly among northern Aboriginal peoples.[34] Furthermore, research has shown that increased intakes of traditional foods beneficially affect the profile of fats consumed such that greater amounts of DHA and EHA are obtained, and a smaller percentage of the total fat in the

diet is from saturated fats.[35] Traditional food use has also been associated with a decreased omega-6:omega-3 fatty acid ratio, which may also be important for cardiovascular health.[36]

Higher proportions of omega-3 fatty acids have been associated with less advanced atherosclerosis in Alaskan Native people compared to the general Alaskan population.[37] However, higher consumption of omega-3 fatty acids by Alaskan Eskimo people did not protect against atherosclerosis compared to their peers who consumed less.[38] This suggests that the dietary risks and benefits of omega-3-rich traditional foods as related to cardiovascular disease must be viewed within a broader context of risk factors.

Higher dietary omega-3 fatty acids have been linked to decreased levels of psychological distress in Inuit women,[39] and the suggestion is emerging that dietary factors such as omega-3, folate and vitamin B12 may be important in the mental health of circumpolar peoples.[40] For mental health, biological and nutritional mechanisms may be inseparable from the cultural and social aspects of traditional lifestyles.[41]

In addition to beneficial fat profiles, traditional Aboriginal foods tend to be lower in carbohydrates, including simple sugars, which are important in conditions such as obesity and diabetes.[42] In a dietary survey of Alaska Native peoples, traditional foods contributed 21% of the caloric energy consumed, but only 3% of the total carbohydrate and 4% of the sucrose consumed in a day; the remaining carbohydrates were contributed by non-traditional foods.[43] On days when no traditional foods were consumed in the Arctic, a greater proportion of dietary energy originated from carbohydrates and sucrose.[44]

Traditional foods are also rich in micronutrients.[45] On days when traditional food is consumed, First Nations, Dene, Métis, and Inuit peoples in the Arctic have higher intakes of riboflavin, iron, zinc, copper, magnesium, manganese, phosphorus, potassium, selenium and vitamins A, D, E, and B-6 as compared to days when traditional foods are not consumed.[46] Good sources of vitamin C have also been documented in the largely animal-based diets of Inuit peoples.[47]

The importance of traditional wild plants in contributing essential micronutrients to diets worldwide is well described, although a systematic understanding of nutritional composition is yet to emerge.[48] Traditional plants are often used in both food and medicine, potentially offering pharmacologic and therapeutic benefits through diet. A detailed discussion of traditional medicine is beyond the scope of this review, however the link between food and medicine must be noted. For example, rose hips, consumed by many First Nations and American Indian peoples in a variety of medicinal and food preparations, are high in vitamin C and demonstrate antibacterial and antioxidant properties.[49]

In summary, traditional Aboriginal foods offer cultural, social and nutritional

benefits that contribute to the health of Aboriginal communities through a variety of complex pathways that must be conceptualized in a holistic manner.

Supporting Traditional Aboriginal Diets

Given the benefits associated with traditional diets, a return to traditional dietary practices seems advisable. However, there are challenges in doing so. In 1998/99, 27% of Aboriginal people living off-reserve had restricted or tentative access to foods that could be considered nutritionally adequate, safe and acceptable.[50] By 2004/05, food insecurity in this group was 33%.[51] A complex issue, food insecurity results from many factors including income, education, social structures, food preferences and accessibility of traditional and market food choices.[52] Traditional food access may be limited by changing social structures that preclude the traditional sharing of labour, or cost and gun licensing requirements associated with hunting activities.[53] Access to traditional foods has also been altered through the loss of traditional lands and legislative restrictions on the use of land and animal resources.[54] Health messages promoting only low animal fat diets, and fruits and vegetables may be perceived as incongruent with traditional Aboriginal diets, creating barriers to incorporating healthier market options alongside traditional foods.[55]

The willingness to consume country foods is also affected by concerns over contaminants in the food chain. Cadmium, mercury, PCBs and pesticides have been documented in traditional foods harvested by groups including the Cree peoples of eastern James Bay and northern Manitoba, the Ojibwa people of Grassy Narrows, and the Inuit peoples of Greenland.[56] With the main route of exposure occurring through traditional foods, Inuit peoples of the Arctic have average dietary intakes of certain organochlorine pollutants above provisional tolerable daily intakes.[57] While the effects of contaminants are not always clear, future research may clarify the role environmental toxins play as risk factors for chronic disease.[58]

The direct impact of returning to traditional diets on health has not been well studied, although this may change in the future as the potential of low carbohydrate diets and traditional foods is applied to the crisis of chronic disease in Aboriginal peoples.[59] Nonetheless, there are examples of ways in which traditional foods and food knowledge can support health in Aboriginal communities.

The Inuit community of Pangnirtung has developed a community health promotion intervention based on traditional foods.[60] Through documentation of traditional country food knowledge, the use of Inuktitut educational stories, and grocery store initiatives, the goal is to improve healthy food choices. Healthy food choices have also been supported through Native Nutrition Models developed in the United States as diabetes and obesity prevention interventions.[61] These models

both describe the history of food system change and educate to influence healthy food choices in a culturally congruent manner. Based on the Medicine Wheel, they incorporate tribe-specific symbols, cultural values, stories and traditional foods. Successful community-based approaches such as the Kahnawake Schools Diabetes Prevention Project and the Sandy Lake Health and Diabetes Project have incorporated traditional culture into the healthy eating and nutritional components of school and community interventions.[62]

The reclamation of traditional lands to produce food in the White Earth Land Recovery Project in the United States demonstrates how the harvesting of traditional foods can be promoted and supported on a commercial scale, helping to rebuild traditional food knowledge.[63] Broader policy initiatives are necessary if the issue is viewed from the perspective of food systems change. For example, policy initiatives to counteract the negative effects of the sedentarisation of the Innu people of Labrador have been suggested.[64] These include developing a specific food policy to promote country food, as well as funding a hunter support program and altering the school calendar to facilitate families being on the land.

Conclusion

The traditional diets and associated physical activities of Aboriginal peoples have been replaced with patterns of consumption that increase the risk of developing cardiovascular disease, diabetes and cancer. However, traditional foods remain important from both cultural and nutritional perspectives, and are associated particularly with beneficial fat, carbohydrate and nutrient profiles. Despite challenges such as food insecurity and bio-contamination, traditional foods remain important for chronic disease prevention and their use can be successfully promoted in Aboriginal communities.

References

1 WHO (2005). Preventing Chronic Diseases: A Vital Investment: Who Global Report. Geneva: World Health Organization.

2 _____. (2002). Diet, Nutrition and the Prevention of Chronic Diseases: Report of a Joint Who/Fao Expert Consultation. Geneva: World Health Organization.

3 Ibid.

4 Ibid.

5 Ibid.

6 Willows, N.D. (2005). Determinants of Healthy Eating in Aboriginal Peoples in Canada. Canadian Journal of Public Health 96 (Supplement 3): S32-S36; Kuhnlein, H.V., Receveur, O., Soueida, R., & Egeland, G. (2004). Arctic Indigenous Peoples Experience the Nutrition Transition with Changing Dietary Patterns and Obesity. The Journal of Nutrition 134: 1447-1453; Johnson, J.S., Nobman, E.D., & Asay, E., & Lanier, A.P. (2009). Dietary Intake of Alaska Native People in Two Regions and Implications for Health: The Alaska Native Dietary and Subsistence Food Assessment Project. International Journal of Circumpolar Health 68(2): 109-122.

7 Johnson et al. (2009).

8 Delormier, T. & Kuhnlein, H.V. (1999). Dietary Characteristics of Eastern James Bay Cree Women. Arctic 52(2): 182-187.

9 Kuhnlein et al. (2004).

10 Willows (2005); Compher, C. (2006). The Nutrition Transition in American Indians. Journal of Transcultural Nursing 17(3): 217-223; Samson, C. & Pretty, J. (2006). Environmental and Health Benefits of Hunting Lifestyles and Diets for the Innu of Labrador. Food Policy 31(6): 528-553; McGrath-Hanna, N.K., Greene, D.M., Tavernier, R.J., & Bult-Ito, A. (2003). Diet and Mental Health in the Arctic: Is Diet an Important Risk Factor for Mental Health in Circumpolar Peoples? - a Review. International Journal of Circumpolar Health 62(3): 228-241.

11 Samson & Pretty (2006); Redwood, D.G., Ferucci, E.D., Schumacher, M.C., Johnson, J.S., Lanier, A.P., Helzer, L.J., et al. (2008). Traditional Foods and Physical Activity Patterns and Associations with Cultural Factors in a Diverse Alaska Native Population. International Journal of Circumpolar Health 67(4): 334-348; Compher (2006); Willows (2005).

12 Compher (2006); Reading, J. (2009). The Crisis of Chronic Disease among Aboriginal Peoples: A Challenge for Public Health, Population Health and Social Policy. Victoria, BC: Centre for Aboriginal Health Research; Willows (2005).

13 Samson and Pretty (2006); Johnson et al. (2009).

[14] Conti, K. (2006). Diabetes Prevention in Indian Country: Developing Nutrition Models to Tell the Story of Food-System Change. Journal of Transcultural Nursing 17(3): 234-245.

[15] Ho, L.S. , Gittelsohn, J., Sharma, S., Cao, X., Treuth, M., Rimal, R., et al. (2008). Food-Related Behavior, Physical Activity, and Dietary Intake in First Nations - a Population at Risk for Diabetes. Ethnicity & Health 13(4): 335-349; Eilat-Adar, S., Jiaqiong, X., Zephier, E., O'Leary, V., Howard, B.V., Resnick, H.E. (2008). Adherence to Dietary Recommendations for Saturated Fat, Fiber, and Sodium Is Low in American Indians and Other U.S. Adults with Diabetes. Journal of Nutrition 138: 1699 - 1704; Johnson et al. (2009).

[16] Downs, S.M., Arnold, A., Marshall, D., McCargar, M.J., Raine, K.D., & Willows, N.D. (2009). Associations among the Food Environment, Diet Quality and Weight Status in Cree Children in Quebec. Public Health Nutrition 12(9): 1504-1511; Taylor, J.P. , Timmons, V., Larson, R., Walton, F., Bryanton, J., Critchley, K., & McCarthy, M.J. (2007). Nutritional Concerns in Aboriginal Children Are Similar to Those in Non-Aboriginal Children in Prince Edward Island, Canada. Journal of the American Dietetic Association 107(6): 951-955.

[17] Downs et al. (2009).

[18] Berti, P.R., Soueida, R., & Kuhnlein, H.V. (2008). Dietary Assessment of Indigenous Canadian Arctic Women with a Focus on Pregnancy and Lactation, International Journal of Circumpolar Health 67(4): 349-362 .

[19] Eilat-Adar et al. (2008).

[20] Taylor et al. (2007).

[21] Stroehla, B.C., Malcoe, L.H., & Velie, E.M. (2005). Dietary Sources of Nutrients among Rural Native American and White Children. Journal of the American Dietetic Association 105(12): 1908-1916.

[22] Ho et al. (2008).

[23] Redwood et al. (2008); Delormier & Kuhnlein (1999); Wein, E.E., Freeman, M.M.R., & Makus, J.C. (1996). Use of and Preference for Traditional Foods among the Belcher Island Inuit, Arctic 49(3): 256-264.

[24] Kuhnlein et al. (2004).

[25] Delormier & Kuhnlein (1999).

[26] Willows (2005).

[27] Public Health Agency of Canada, "What Determines Health?," http://www.phac-aspc.gc.ca/ph-sp/determinants/index-eng.php.

[28] Johnson et al. (2009); Wein, Freeman, & Makus (1996).

[29] Willows (2005).

[30] Redwood et al. (2008).

[31] Willows (2005); Wein, Freeman, & Makus (1996).

[32] Samson & Pretty (2006).

[33] World Health Organization (2002).

[34] McGrath-Hanna et al. (2003); Lucas, M., Dewailly, E., Blanchet, C., Gingras, S., & Holub, B.J. (2009). Plasma Omega-3 and Psychological Distress among Nunavik Inuit (Canada). Psychiatry Research 167(3): 266-278; McLaughlin, J., Middaugh, J., Boudreau, D., Malcom, G., Parry, S., Tracy, R., & Newman, W. (2005). Adipose Tissue Triglyceride Fatty Acids and Atherosclerosis in Alaska Natives and Non-Natives. Atherosclerosis 181(2): 353-362; Bersamin, A., Luick, B.R., King, I.B., Stern, J.S., & Zidenberg-Cherr, S. (2008). Westernizing Diets Influence Fat Intake, Red Blood Cell Fatty Acid Composition, and Health in Remote Alaskan Native Communities in the Center for Alaska Native Health Study. Journal of the American Dietetic Association 108(2): 266-273; Eilat-Adar et al. (2008); Ebbesson, S.O.E., Roman, M.J., Devereux, R.B., Kaufman, D., Fabsitz, R.R., MacCluer, J.W. et al. (2008). Consumption of Omega-3 Fatty Acids Is Not Associated with a Reduction in Carotid Atherosclerosis: The Genetics of Coronary Artery Disease in Alaska Natives Study. Atherosclerosis 199(2): 346-353.

[35] Bersamin et al. (2008).

[36] Ibid.

[37] McLaughlin et al. (2005).

[38] Ebbesson, S.O.E., Adler, A., Risica, P.M., Ebbesson, L.O.E., Yeah, J-L, Go, O.T., et al. (2005). Eskimos Have Chd Despite High Consumption of Omega-3 Fatty Acids: The Alaska Siberia Project. International Journal of Circumpolar Health 64(4): 365-386.

[39] Lucas et al. (2009).

[40] McGrath-Hanna et al. (2003).

[41] Lucas et al. (2009).

[42] McGrath-Hanna et al. (2003); Willows (2005); Johnson et al. (2009); Kuhnlein et al. (2004); Eilat-Adar et al. (2008).

[43] Johnson et al. (2009).

[44] Kuhnlein et al. (2004).

[45] Kuhnlein, H.V. & Receveur, O. (2007). Local Cultural Animal Food Contributes High Levels of Nutrients for Arctic Canadian Indigenous Adults and Children. Journal of Nutrition 137: 1110-1114.

[46] Kuhnlein, H.V. et al. (2004).

[47] Fediuk, K., Hidiroglou, R., Madere, R., & Kuhnlein, H.V. (2002). Vitamin C in Inuit Traditional Food and Women's Diets. Journal of Food Composition and Analysis 15(3): 221-235.

[48] Grivetti, L.E. & Ogle, B.M. (2000). Value of Traditional Foods in Meeting Macro- and Micronutrient Needs: The Wild Plant Connection. Nutrition Research Reviews 13(1): 31-46.

[49] Yi, O., Jovel, E.M., Towers, G.H., Wahbe, T.R., & Cho, D. (2007). Antioxidant and Antimicrobial Activities of Native Rosa Sp. From British Columbia, Canada. International Journal of Food Sciences and Nutrition 58(3): 178-189.

[50] Che, J. & Chen, J. (2001). Food Insecurity in Canadian Households. Health Reports 12(4): 11.

[51] Willows, N.D., Veugelers, P., Raine, K., & Kuhle, S. (2009). Prevalence and Sociodemographic Risk Factors Related to Household Food Security in Aboriginal Peoples in Canada. Public Health Nutrition 12(8): 1150-1156.

[52] Chan, H.M., Fediuk, K., Hamilton, S., Rostas, L., Caughey, A., Kuhnlein, H., Egeland, G., & Loring, E. (2006). Food Security in Nunavut, Canada: Barriers and Recommendations. International Journal of Circumpolar Health 65(5): 416-431.

[53] Ibid.

[54] Conti (2006); Kuhnlein, H.V. (1992). Change in the Use of Traditional Foods by the Nuxalk Native People of British Columbia. Ecology of Food and Nutrition 27(3-4): 259-282.

[55] Cassady, C. (2008). 'Eating for Outsiders': Cancer Causation Discourse among the Inupiat of Arctic Alaska. International Journal of Circumpolar Health 67(4): 374-383.

[56] Samson & Pretty (2006).

[57] Van Oostdam, J., Donaldson, S.G., Feeley, M., Arnold, D., Ayotte, P., Bondy, L. et al. (2005). Human Health Implications of Environmental Contaminants in Arctic Canada: A Review. Science of the Total Environment 351-352: 165-246.

[58] Sharp, D. (2009). Environmental Toxins, a Potential Risk Factor for Diabetes among Canadian Aboriginals. International Journal of Circumpolar Health 68(4): 316-326.

[59] Westman, E.C., Feinman, R.D., Mavropoulos, J.C., Vernon, M.C., Volek, J.S., Wortman, J.A. et al. (2007). Low-Carbohydrate Nutrition and Metabolism. American Journal of Clinical Nutrition 86(2): 276-284.

[60] Egeland, G., Charbonneau-Roberts, G., Kuluguqtuq, J., Kilabuk, J., Okalik, L., Soueida, R., & Kuhnlein, H.V. (2009). Back to the Future: Using Traditional Food and Knowledge to Promote a Healty Future among Inuit. In Indigenous Peoples' Food Systems, pp. 9-22. Rome: Food and Agriculture Organization of the United Nations Centre for Indigenous Peoples' Nutrition and Environment.

[61] Conti (2006).

[62] Harris, S.B. (1998). What Works? Success Stories in Type 2 Diabetes Mellitus. Diabetic Medicine 15(Suppl. 4): S20-S23.

[63] Conti (2006).

[64] Samson & Pretty (2006).

This document is an update of the original design:

sharing knowledge · making a difference

partager les connaissances · faire une différence

ᖃᐅᔨᒃᑲᐃᖃᑎᒌᓃᖅ · ᐱᕚᓪᓕᖅᑎᑦᑎᓂᖅ

NATIONAL COLLABORATING CENTRE FOR ABORIGINAL HEALTH

CENTRE DE COLLABORATION NATIONALE DE LA SANTÉ AUTOCHTONE

FOR MORE INFORMATION:
UNIVERSITY OF NORTHERN BRITISH COLUMBIA
3333 UNIVERSITY WAY, PRINCE GEORGE, BC V2N 4Z9

1 250 960 5250
NCCAH@UNBC.CA
WWW.NCCAH-CCNSA.CA

 This publication was funded by the NCCAH and made possible through a financial contribution from the Public Health Agency of Canada. The views expressed herein do not necessarily represent the views of the Public Health Agency of Canada.