

Effects of Modernization, Global Pollution, Climate Change on Food Security among Indigenous Peoples in the Arctic**

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Summary

The importance of traditional/country food as a critical resource for the health and wellbeing of Indigenous populations in the Arctic is well documented. Despite this, shifts away from traditional/country food (i.e., food that is hunted/gathered) consumption have been occurring over the past three decades largely due to modernization and environmental changes, including global pollution and climate change. These changes affect the availability and accessibility to traditional/country food, which contribute to the alarming rates of food insecurity found in many Indigenous communities. Because of the complexity of the factors involved, innovative approaches in research methodology, public health intervention/adaptation programs, and integrative wildlife/food system management programs are needed. Policies at the local, national, and international levels need to be developed and implemented to enhance food security in the Arctic.

Current realities

Indigenous populations residing in the Arctic regions whose territories extend across two or more nation states (e.g., the Sami, Inuit, Dene, Aleut, and Evenk) are encountering myriad unprecedented and rapid environmental, social, and economic changes. Most of these Indigenous peoples are practicing partial subsistence living (i.e., using a mix of market and country/traditional foods). Hunted and gathered country/traditional foods include a high variety of species of animals and plants (e.g., beluga whales, seal, caribou, arctic char, berries). The composition of these traditional diets can vary considerably depending on the culture, geography and ecology of these communities.

Traditional/country foods provide critical resources for the physical, mental, social, and economic health and wellbeing of individuals and communities across the Arctic. A diet rich in traditional/country food is thought by public health professionals to protect against cardiovascular disease and diabetes due to relatively high levels of n-3, mono and polyunsaturated fatty acids, and low levels of n-6 fatty acid. Other dietary characteristics include high intakes of antioxidants, vitamins, micronutrients, and phytochemicals. Beyond the many nutritional benefits, the harvesting, processing, and consumption of traditional foods have great social and cultural importance and are deeply connected with community ethics and Indigenous identities.

Indigenous populations are experiencing a nutritional shift, resulting from a set of complex modernizing, and industrial forces that have transitioned a subsistence economy to a salary/welfare based economy. Dietary patterns now include processed foods that are high in salt, sugar, and fat and also include fewer locally harvested foods resulting in lower intakes of several key nutrients (e.g., protein, iron, and zinc). Changes in diet and lifestyle are also associated with increased rates of obesity and chronic diseases (e.g., type 2 diabetes, cardiovascular disease). Living with these ailments is especially difficult under conditions of increasing food insecurity. To be food secure, individuals and households must be able to reliably access food (usually through adequate income) and the supply and production of nutritious food at the community level must be sufficient. Impediments to food security in many Arctic indigenous households exist due to issues relating to both the access to, and availability of, nutritious food. Many studies have shown that the food insecure rate in many indigenous communities can reach an alarming rate of more than 50%.

Food security is also related to the significant environmental changes resulting from ecological shifts in the Arctic. These shifts have been primarily associated with reduced confidence in food

safety, due to identified threats from environmental contaminants, and more recently from changes in species availability and accessibility, due to shifting climatic conditions. For example, despite residing in locations distant from industrial activity, Arctic populations are especially vulnerable to environmental contaminant exposure. Contaminants undergo long-range transport from warmer to colder regions, making the Arctic a “sink” for contaminant deposition. Because lipophilic chemicals, such as persistent organic pollutants, collect in the fatty tissues of animals and accumulate at the higher ends of the food chain, the consumption of fish and marine mammals by Arctic populations leads to direct contaminant exposure.

Climate related changes and variability in the Arctic have been associated with changes in animal, fish, and plant population health and distribution. Changes in environmental factors influence human travel and transportation, and thus access to wildlife resources. It is clear that climate change and variability have the potential to influence nutrition and health statuses among Indigenous populations through availability, accessibility, and quality of traditional/country food.

Scientific opportunities and challenges

Processes of modernization, global pollution, rapid and sometimes unpredictable environmental change, economic transitions and material poverty, changing demographics, and current logistical challenges are some of the factors that shape this modern version of food insecurity. The complexity of the interactions of all these factors points to the need for multidisciplinary approaches to understanding and resolving the issues. New frameworks and paradigms that cross traditional disciplines need to be developed, and international collaborations are needed for sharing experiences and methodologies. A number of health studies conducted in Canada, Greenland and Alaska in the last decade provide baseline data relating diet and health statuses of Indigenous populations. This data provides opportunities to study the impacts of climate change on food security and nutrition over time and in a circumpolar context.

Exposures to global pollutants (e.g., mercury) from the consumption of traditional/country food have been associated with subclinical, biochemical effects and increased systolic blood pressure in adults, as well as sensory function impairment in children in some Arctic communities. Consequently, food consumption advisories warning the public of contaminant risks from marine mammal consumption have, in some instances, been found necessary for the protection of public health. However, given the chronic food insecurity issues, wholesale reductions in traditional food consumption to limit contaminant intake are likely to dramatically and negatively effect nutrient intakes. Consequently, it is important that food advisories pertaining to the presence of contaminants in traditional foods are designed to lower contaminant exposure while minimizing the adverse effects associated with lower nutrient intakes. This requires comprehensive risk and benefit assessment paradigms to be developed and applied.

Research results have indicated that both positive and negative changes across different communities were reported in regards to climate change and variability affects on traditional/country food harvests. However, the impacts are not homogenous among all hunter-gathers and communities, and both individuals and households demonstrate differing abilities to adapt successfully. Factors such as access to economic resources and equipment, experience, and the nature of the adaptive strategy used, appear to influence the success of hunter adaptations to climate conditions. Therefore, it is important to further study the differentiating factors across individuals and households.

Further, based on the available harvest and local consumption data, it is feasible to relate wildlife harvest data to traditional/country food use at both community and regional levels. Thus, it is possible to model the relationship between climate projections, impacts on key environmental variables influencing availability of wildlife and/or access to traditional/ country food species (e.g., ice conditions), and the level of viable consumption of those species in the community. This information is critical for furthering our understanding of the major determinants of

traditional/country food consumption in Arctic communities and of the current and future impacts of climate variability and change on traditional/country food consumption. As the pace and variability of change increases, it is important to identify key aspects of individual and collective adaptive capacity that require enhancement to affect positive change and to also support effective responses to protect and promote traditional/ country food consumption for Arctic Indigenous populations going forward.

Policy issues

- It is critical for researchers, health professionals, and policy makers to work together to identify the level and scope of food (in)security; individual, household, community, regional, and national contexts necessitate different types of analysis and engagement.
- Food sovereignty is based on the principle that decisions about food systems, including markets, production modes, food cultures, and environments, are made by those who depend on them. Support for autonomous community food systems, community-based research, and community-based solutions that respond to locally identified needs has emerged as essential steps toward meeting the goal of sustainability and local food self-sufficiency. Therefore, community engagement is key to the success of any effective policy. For example, wildlife conservation efforts and related policy measures need to consider the need for food among communities in that particular region.
- A continuum of programs and policies can be used to address food insecurity, ranging from short-term mitigation (e.g, food banks, children's feeding programs) to capacity building and skills development programs (e.g., community gardens, cooperative buying clubs), to long-term organizational changes and policy responses that focus on root causes (e.g., food policy networks, food system interventions).
- Multilevel approaches based on intersectoral collaboration among communities, local agencies, government, and institutions are important for successful and sustainable initiatives. There are a number of such initiatives at grassroots (e.g., community-led food assessments, community gardens), provincial and territorial levels (e.g., Manitoba's Northern Healthy Foods Initiative, Nunavut Food Security Strategy), and national (e.g., Idle No More). To build food security and food sovereignty, initiatives should aim to: 1) increase the affordability and availability of healthy food; 2) promote health and education; 3) enhance community wellness and intergenerational knowledge sharing; 4) provide harvester support and sustainable wildlife management; 5) reduce poverty and support community economic development; 6) support innovation in infrastructure and local food production; and 7) increase youth engagement.
- For global pollution and climate change, international efforts are needed to reach agreements on collective action to control the use and release of toxic chemicals and carbon dioxide. Arctic food security is a health as well as human rights issue that needs to be considered in a global context.

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