

---

MAY-JUNE 2015

---

## Food in the Last Frontier: Inside Alaska's Food Security Challenges and Opportunities

by Elizabeth Hodges Snyder and Ken Meter

As unlikely as it might sound, the summer 2013 shortage of oscillating fans and air conditioners in Alaska provides a glimpse of the food security and food sovereignty vulnerabilities in the nation's northernmost state.<sup>1</sup> Summer temperature records led to a run on home cooling equipment and subsequent empty shelves, and it was hard not to ponder the implications should the state ever face similar shortages of food. To be sure, gaps in demand forecasting, coordination of supply, and distribution infrastructure with respect to the provision of nonessential appliances may not be cause for great concern, but the same cannot be said for Alaska food systems. Throw in fallout from political uncertainties (e.g., subsistence hunting ammunition shortages in rural Alaska due to stockpiling) and a state focus on resource extraction, and this begs the question of whether or not all of Alaska is in a position to feed itself should a long-lasting food system interruption occur.<sup>2</sup>

This past November in a rural southwest Alaska village, just a short-lived interruption led to the loss of significant quantities of food and the delivery of emergency services. The village generator failed at the tail end of an unseasonably warm fall, resulting in the thawing of residents' freezers and the spoilage of community supplies of salmon, moose, bird, berries, and groceries.<sup>3</sup> After a community survey conducted by the Alaska Division of Homeland Security and Emergency Management, the state prepared to deliver 11,000 pounds of emergency food to the village of 400 people.<sup>4</sup>

Several groups around the state of Alaska, including community councils, nonprofit organizations, government agencies, extension agents, and academics, are working to address food security concerns. For example, the exceptionally active Sitka Local Foods Network recently completed a Community Food Assessment (CFA) while continuing to support multiple community engagement and education initiatives; the Co-op Market Grocery and Deli in Fairbanks opened in 2011 to, in part, promote local suppliers, and is growing thanks to its 2800 invested owners; and the 3-year-old Alaska Food Policy Council (AFPC), whose broad mission is to improve Alaska food systems for the benefit of all Alaskans, recently concluded its first food conference, successfully advocated for an Administrative Order to establish an Alaska Food Resource Working Group to advise the governor on building a strong food economy, conducted a series of town hall listening sessions with Alaska residents, and published a commissioned report that provides a rich overview of food security in the state to inform future project and policy decisions.<sup>5</sup> For the reader with a particular interest in sustainable agriculture in the circumpolar north, the Meter and Goldenberg report pairs well with the recently published three-part series of articles by Stevenson et al. in *Arctic*.<sup>6</sup>

The question addressed by Alaska food groups is not *can* Alaska feed itself, but *how* can it ensure self-sufficiency in the face of climate change, growing populations and shifting distributions, vulnerability due to reliance on global markets, the increasing disconnect between harvester and consumer, and now declines in the price of oil (which is Alaska's primary source of revenue)? For all its natural riches in land and sea sustenance, Alaska faces a variety of challenges to food security. Some challenges, like those of long winters and geographical distance from the contiguous 48 states, are common to all

Alaskans; other challenges are unique to those living in rural communities and practicing traditional subsistence activities, or to those living in urban Alaska and shopping at grocery chains or farmers markets. Understanding and addressing the challenges—and opportunities—in Alaska food systems is important to the protection and promotion of food security, health, and cultural richness in the circumpolar north, as well as to the lower latitudes of the United States. Alaska has more to export than Ulu knives, smoked salmon, chilled tourists, stunning photos, and reality television shows. There are also lessons to learn from the food traditions that have been passed down for generations, as well as from watching a modern food landscape, born from the collision of Indigenous and Western food systems, develop from the permafrost up. To this end, the article herein highlights several of the community-scale innovations and recommendations presented in the AFPC-commissioned Meter and Goldenberg report.<sup>5</sup>

## **Finding Food in Alaska**

Alaska truly is a land of natural abundance, and it leads the United States in several food-relevant categories: the number of national parks (eight; tied only by California); the largest national park (Wrangell–St. Elias National Park and Preserve); the largest fishing port in terms of the amount of fish landed—primarily walleye pollock; subsistence users per capita; and it is the world's largest harvester of wild salmon.<sup>7</sup> And although Alaska doesn't currently own many major titles in agricultural production for human consumption (it has the smallest agricultural industry despite being the largest state in the Union), it does best the rest of the United States in terms of the percentage of farm cash receipts that are sold directly from farmers to consumers (i.e., 3.8%, or 13 times the national average).<sup>5</sup> Further, the food industry is a significant part of the economy, generating more than \$5 billion in sales each year. In fact, the combined sectors of food manufacturing, grocery stores, and dining employ 12 times more people than the oil and gas sector, and supply more than twice the payroll.<sup>5</sup> Alaska might not immediately jump to mind when one thinks about farming, but the state has a long history of agricultural efforts, is home to innovative cold-climate farmers, and has enormous potential for expansion—and this potential could continue to grow as climate change shifts growing zones north, extends growing seasons, and brings increasing amounts of precipitation.

If Alaska is such a cornucopia, then why the concern over food security? Part of the answer, in addition to challenges previously cited, also has to do with resiliency. Although the incidence of food insecurity in Alaska is lower than the national average, the ability of Alaska to rebound from a major food system disruption before serious hardship sets in is uncertain. Yes, there are rural and remote communities whose traditional subsistence ways of life supply them with most of what residents need, but the majority of the state's population resides in urban centers. And even those rural communities aren't immune to the risk of food insecurity, as evidenced by the decline of youth engaged in traditional hunting and fishing practices and by the aforementioned failure of a village generator. Most who practice some form of subsistence or personal use activity (65% of Alaska residents do), bartering, and/or gardening (~34% consume some produce from personal or community gardens)<sup>8</sup> only partially rely on wild harvest or homegrown foods, and obtain the majority of their food from the store.

Potential agricultural production is great in Alaska, but it comes with several environmental and economic challenges, including a short growing season, often suboptimal soils, and the high price of fuel and supplies partially due to long-distance shipping costs, expensive land (and the costs to clear it), and the fact that imported food is widely available at lower costs than Alaskans can produce it.<sup>9</sup> Only an estimated 5–10% of Alaska's food is from in-state agriculture, although as recently as 1955, 55% of food consumed in-state was grown in Alaska.<sup>10</sup> Alaska's fisheries are world class and exceedingly productive, but approximately two-thirds of harvested seafood (valued at ~\$3.2 billion) is exported.<sup>11</sup> Further, even if Alaska were to succeed in growing and harvesting all of its food in-state, and residents enjoyed a truly “local” diet, solutions to the infrastructure needs for “local” processing, storage, and distribution in a state two and half times the size of Texas require some out-of-the-box thinking.<sup>12</sup> Pair this with the “graying” of farmers and fishing fleets, and few trained replacements; difficulties in land access; long-running tension between subsistence and personal use, commercial, and sport fishing sectors; and a (hungry) state population that continues to grow and concentrate in urban areas, and it is clear that no one should take a meal for granted.

However, this article is not meant to paint a dire picture of Alaska food security. Just the opposite. Alaska's food system—indeed, any food system—is composed of several interconnected activities, including production, processing, packaging, distributing, retailing, consuming, and disposal/recycling. These activities impact several food security outcomes (i.e., food availability, access, and utilization) that collectively interact with external socioeconomic (e.g., demographics, economics, socio-political context, science and technology) and environmental (e.g., land cover, atmospheric conditions, climate, water availability/quality, nutrient levels, and biodiversity) drivers.<sup>13</sup> A proverbial weak link in the chain makes the entire system vulnerable to failure. However, in every component of the Alaska food system, there are people not just making the best of a challenging environment, but innovating—either by looking forward or reimagining historical, traditional approaches—and thriving because of it.

### **Food Availability in Alaska**

The “food availability” aspect of food security typically encompasses production, distribution, and exchange, but “noncommercial wild food collection” needs also to be added to the Alaska version of the definition. It is estimated that through subsistence, personal use, general hunting, and sport fishing, Alaskans collectively harvest 52 million pounds of fish and game each year.<sup>14</sup> This translates to roughly \$180–365 million in store-bought foods annually (higher estimates have also been made, or approximately 13–26% of the \$1.4 billion spent on food in Alaska retail grocery stores and 13–26 times the value of food grown in state for human consumption [~\$14 million]).<sup>5,14</sup>

Agricultural production occurs on roughly 760 farms, most of which are small and clustered in the 880,000-acre Matanuska Valley northeast of Anchorage.<sup>15</sup> As recently as a few decades ago, farmers and scientists debated the potential for agriculture in Alaska, with the skeptics citing climate, thin topsoil horizons, low soil fertility, and wide dispersion of arable land as limiting factors.<sup>16</sup> Subsequent years of soil surveying and assessment, however, resulted in an estimate of ~59 million acres of arable land where climate is not an excessively limiting factor.<sup>16</sup> This land includes 175,000 acres of fertile soils (albeit with thin topsoil) in the Nenana–Totchaket Valley, between the Tanana and Kantishna Rivers.<sup>17</sup> Developing access to this land is driven primarily by the lure of oil and minerals, and requires a bridge and road development, which is currently underway. Nevertheless, agricultural parcels could be released by the Department of Natural Resources (DNR) as early as 2015, and experts caution that the area should be developed as a stable agricultural community with a thoughtfully designed transportation system, rather than a settlement of scattered farms prone to cannibalization by suburban development.<sup>5,18</sup>

Shifting from land to sea, the annual revenue generated by the commercial fishing industry (~\$4 billion) far exceeds that of agriculture. Fifty percent of wild-caught seafood in the United States is caught in Alaska, and 95% of salmon caught in the United States is wild-caught Alaskan salmon.<sup>11,19</sup> The fishing industry and its support industries employ more people than any other nongovernment industry in the state, and commercial fishing is beat only by oil and gas in private sector resident earnings.<sup>11,20</sup> The enormous importance of Alaska fisheries is not lost on policymakers, and Alaska's extensive fishing grounds are some of the most tightly regulated and enforced areas in the world.<sup>19,21</sup>

Production, distribution, and exchange challenges in Alaska have many commonalities with the Lower 48. Challenges in the agricultural sector, other than climate and geography, include capital for farm investment; access to land; capacity constraints; lack of distribution systems for moving local food into mainstream markets; lack of storage infrastructure; and limited research, formal and informal education, and training programs for marketing local foods.<sup>5,22</sup> Challenges in the fishing sector include recent declines in Chinook (king) salmon returns; concerns over the health of halibut populations; tension between commercial, subsistence, and sport fishing sectors; reductions in the price commanded per pound of fish; bycatch; and the fact that many fishing companies and fishermen come from Outside.<sup>23</sup> Further, food safety requirements, land use and zoning changes, fisheries management schemes, and changes in government programs designed to support local food production that are designed, in part, to promote food security can also create additional challenges and

uncertainties.<sup>5,24</sup>

### **High Tunnels, “Free” Heat, and Fishy Business**

Historical, current, and future successes in ensuring Alaska food availability depend in large part on the adaptability and persistence of those tasked with harvesting and distributing food. With respect to agriculture, one ever-present goal is extension of the growing season—which is naturally about 100 days, from mid-May through August. High tunnels (i.e., tall, mobile hoop houses comprised of ribs and plastic that trap heat like a greenhouse, warming both the air and soil) are a low-tech option very popular in the less windy regions of Alaska. And while high tunnels in and of themselves are not especially remarkable examples of season extension technology, their broad use in Alaska is. Alaska ranks number one among states that take advantage of a U.S. Department of Agriculture (USDA) high tunnel subsidy program, with growers having matched \$4 million in USDA Natural Resources Conservation Service (NRCS) funds.<sup>5,25</sup> Community garden groups in and around such places as Nome, Kotzebue, and Kodiak have taken advantage of high tunnel funding, as have farmers in Bethel, Palmer, Talkeetna, and Fairbanks.

For less hardy crops or in the most challenging environments, high tunnels do not suffice and growers look for energy sources to heat greenhouses. At the Chena Hot Springs resort, this heat comes in the form of geothermal energy. Radiant heat from 155°F water pumped from a shallow well warms the greenhouse, allowing year-round production of several lettuce and tomato varieties—even when outside temperatures dip as low as -50°F. A similar approach was previously used outside Nome, but the remote location and lack of supporting infrastructure proved prohibitive. Alternatively, the capture of waste heat from buildings and power plants is being explored in Nome, Fairbanks, and Kake; biomass will be burned to heat greenhouses in Fort Yukon and Thorne Bay; wind energy generates the heat for a Pribilof Island greenhouse; and a prominent Bethel farmer currently utilizes solar energy to heat his greenhouses, which are paired with high tunnels, outdoor plots, and an underground storage system to bring vegetables to market.<sup>5</sup>

Many folks would like some protein to go alongside Alaska-grown fruits and vegetables, and one sourcing option particularly suited to those without the time or ability to harvest wild foods themselves is a community-supported fishery (CSF), whose approach is similar to the better known community-supported agriculture (CSA) model. The Alaska Sustainable Fisheries Trust launched Alaska's Own, which sells fish to subscribers in Sitka, Juneau, and Anchorage. Fishers enrolled in the program pledge to pursue sustainable practices, and proceeds are directed to the Fisheries Conservation network program for scientific research and conservation initiatives intended to ensure the continued health and success of Gulf of Alaska fisheries.<sup>5</sup> The Alaska Marine Conservation Council also operates Catch of the Season Community Seafoods, a mission-related business that has been supplying Anchorage, Homer, and Kodiak markets since 2010. The firm began by offering Kodiak Tanner crab caught by community-based fishermen to residents and restaurants in each area, as well as Princess Tours. It has since expanded to offer jig-caught cod and rockfish in response to a 2014 closure of the Kodiak Tanner crab fishery due to the low abundance of mature males.

### **Food Access in Alaska**

The “food access” component of food security includes issues of affordability, allocation (i.e., the forces influencing when, where, and how food can be accessed), and preference (which is influenced by social, religious, and cultural norms and values).<sup>13</sup> It is this access component that often comes to mind first when evaluating the extent of food insecurity. The prevalence of household food insecurity in Alaska was estimated to be 11.6% in 2006–2008, which is similar to the national average.<sup>26</sup> However, when the data are further parsed,<sup>26</sup> some important disparities come into focus: The greatest number of food-insecure individuals reside in and around Anchorage, whereas the prevalence of food insecurity is greatest in rural regions of Alaska (23.4%); food insecurity is more likely in households with children; and Alaska Native adults are twice as likely to be food insecure as their adult counterparts.<sup>27</sup>

The rates of food insecurity in Alaska are partly a function of food prices. Food grown in-state is expensive due to the cost of

inputs, inefficiencies, absence of economies of scale, and lack of competition, while imported food bears the transportation costs associated with the ~3,000–4,500 miles traveled between the producer and consumer.<sup>28</sup> Approximately 10% of family income is spent on food in the United States, whereas the figure is closer to 14% in Alaska.<sup>29,30</sup> Meals for a family of four can cost 2.5 times more in Alaska than in Portland, Oregon, and anecdotal evidence indicates that some food prices can reach 600–1000% the cost in the Lower 48.<sup>29</sup> Adding potential health injury to insult is the fact that the most unhealthy options (i.e., highly processed, high-sugar, and high-fat products) are often cheaper in rural Alaska than fresh foods, and Country diets are ever-shifting to include increasing proportions of store-bought foods.<sup>31</sup>

### **Home Cooking, the World's Best Cafeteria Food, and Runaway Reindeer**

The creeping of processed Western foods into rural Alaska Native diets—whether by choice, necessity, or some combination of the two—occurs not only through small community food stores, but also in institutional settings like nursing homes, food banks and shelters, hospitals, and even prisons. For those accustomed to, and who have a preference for, Country foods, an abrupt shift to a Western diet can have adverse mental and physical health effects. Norton Sound Health Service staff in Nome, for example, report that Alaska Native elder residents' health improved when traditional foods were incorporated into the meal program. This incorporation has been made possible through the new Farm Bill, which makes it easier for traditional foods to be sourced in institutional settings.<sup>5</sup> However, much work remains if traditional foods are to gain a stronghold in institutional food programs. While real limitations exist (e.g., valuable regulations limiting the sale of subsistence harvests, and food safety guidelines), some challenges boil down to a lack of knowledge about what can and can't be done with respect to wild foods and institutional sourcing; thus, groups consisting of professionals from academia, government organizations, research consultancies, and nonprofits (including AFPC) are currently working to develop educational materials for food purchasers and preparers in a broad effort to eliminate common misperceptions regarding traditional foods, institutional settings, and regulations.

Another institutional setting whose food landscape is being transformed is the school system. Farm-to-school and fish-to-school programming, using special state funds to purchase food from Alaska sources, is bringing local produce and wild Alaska seafood into school cafeterias in Nome, the Yukon Delta, Dillingham, Kodiak, and Sitka. In 2013 alone, \$3 million was distributed to Alaska school districts through the Nutritional Alaskan Foods in Schools pilot program to purchase produce certified as Alaska Grown by the Alaska Department of Natural Resources (DNR) Division of Agriculture. The health and economic impacts of increased access to healthy, local options in schools are being assessed by researchers, and tool kits to assist schools in sourcing and serving Alaska products are being made available.<sup>5</sup>

A final example of novel food accessibility improvement approaches in Alaska is situated within a unique overlap of the controlled nature of agriculture and the relative unpredictability of wild game. Reindeer herding has a long history in Alaska and is a livelihood legally reserved for Alaska Natives. Originally living a nomadic way of life, reindeer herders learned that the reindeer responded well to the establishment of more permanent settlements, staying close to herders' homes even without fencing. However, over the past few years, caribou (a related species that is not domesticated) have migrated west into the peninsula and have come into contact with the reindeer herds. The reindeer have attached themselves to the caribou herds and some herdsmen have lost tens of thousands of reindeer. It is estimated that as much as 90% of the industry has been lost.<sup>5</sup> In response, University of Alaska Fairbanks (UAF) specialists are now developing designs for partial enclosures to limit contact between the herds and minimize reindeer loss. As herders and researchers wait for the caribou to migrate out of the region before rebuilding the reindeer herds, strategizing continues on how to create a more commercial reindeer industry (e.g., approaches to restocking the herd, herder education, and development of a mobile slaughter unit to simultaneously support some aspects of Native slaughter practices and meet USDA regulations for commercial sale).<sup>32</sup>

### **Food Utilization in Alaska**

The third and final component of food security is “food utilization,” which addresses the nutritional value, social value, and safety of food.<sup>13</sup> Even if food is physically available and accessible, food security is not achieved if the food does not provide

consumers with the necessary nutrients or social cohesion and fulfillment, or if it is contaminated. The percentage of adults and high school students in Alaska who meet recommendations for the consumption of fruit and vegetables, as an indicator of population nutrition status, is just 10%.<sup>33</sup> Women in Alaska are more likely to meet the consumption recommendation than men, as are non-Natives in comparison with their Alaska Native peers, and urban residents as compared to rural.<sup>34</sup> On the other hand, obesity, which is associated with overnutrition, heart disease, diabetes, and some cancers, is on the rise in and outside of Alaska. Obesity rates for the State of Alaska have been steadily increasing since 1991.<sup>35</sup> Selecting cheaper but less nutritious food items is likely contributing to the current overweight and obesity epidemic in Alaska. Approximately 65% of adults are overweight or obese, and 26% of Alaska's youth are overweight or obese, with the risk being greatest for Alaska Natives and adults with limited education.<sup>33</sup>

It should not be construed, however, that country food consumption by Alaska Natives is the cause of elevated rates of obesity in this population. Rather, the increased consumption of Western foods is the likely culprit.<sup>5</sup> Unlike the processed foods that weather long and arduous journeys to store shelves, Country foods are high in healthy proteins and fats, while low in carbohydrates and calories.<sup>5</sup> Wild greens like seaweeds and algae are high in vitamins, and one serving of seal, for example, has the same amount of iron as six cheeseburgers.<sup>5</sup>

Many aspects of food safety in Alaska are no different than anywhere else—for example, restaurants require inspection; general safe food handling practices in the home still apply; and municipalities continue to figure out the best ways to regulate the wildly popular urban food trucks. But there are several aspects of the Alaska food environment that require special attention to ensure the safety of eaters. Wild food harvest, preparation, and storage (when done without proper traditional precautions) make Alaskans more vulnerable to bacteria and parasites. Climate change and resulting melt water are limiting the utility of traditional underground food cellars for storing whale meat and other foods through the nonwinter months. Food that survives flooded, warmed cellars may be of questionable safety.<sup>36</sup> Paralytic shellfish poisoning (PSP), which can occur after consumption of recreationally caught shellfish contaminated with algae that produce paralytic shellfish toxin (PST), is a risk (albeit relatively low) that is familiar to Alaskans. And home canning, which requires food safety diligence by the canner, is also exceptionally popular due to the pairing of a short growing season and the desire for produce year-round.

### **The Store Outside Your Door**

The aforementioned elder-care home example for innovations in food accessibility also applies to the food utilization component of food security, in that previous food safety regulations once prevented the sourcing of wild foods in the institutional setting, and the lack of these wild foods not only had negative health consequences but also impinged upon the social traditions associated with consumption of such foods. Similarly, the Store Outside Your Door initiative led by health specialists at the Alaska Native Tribal Health Consortium (ANTHC) is designed to bring activities to villages that will help younger generations of Alaska Native people learn more about eating in traditional ways, harvest available wild foods, and document traditional knowledge of local foods before it is lost. Utilizing multimedia and a local celebrity chef, the program creates YouTube video shorts to reorient its target audience to the use of wild harvest foods, and to encourage contemporary twists on traditional recipes. Store Outside Your Door has been particularly popular among and well received by Alaska Natives and non-Natives alike.

### **Looking Back on Lessons Learned, Looking Forward to What Lies Ahead**

Countless lessons have been learned as generations of Alaskans have worked to provide for their families, in rural and urban Alaska alike. Faster is not always better—as evidenced by the increased risk of botulism when speeding up traditional fermentation recipes with heat under anaerobic conditions. Nor is bigger always better—as evidenced by the 2012 failure of a local creamery that likely overbuilt its capacity while not being price competitive with imports. Historically, hefty investments of public money in food production focused on large-scale projects and operations.<sup>5</sup> Loans and high expectations for export markets were focused upon at the expense of slowly building capacity in step with in-state consumer

loyalty and demand. Further increasing food production will require adaptability in the face of climate change, as well as some thinking outside the box. Whether the project is controlled microclimate growing in retrofitted shipping containers; taking advantage of untapped existing resources (like empty airplanes on return flights) to adapt to limited distribution infrastructure, tending a potato garden at fish camp, or training new farmers via distance education, it will be appropriately scaled innovation, persistence, and resourcefulness that drives success.

A common thread to all of the innovative Alaska food activity examples is the focus on local production, harvest, and consumption. This is consistent with the national trend of placing top social and economic value on locally sourced products. Although dissenters exist (e.g., Born and Purcell<sup>37</sup> argue that “local” does not always translate to reduced environmental impacts), the current general consensus is that sustainable and socially just food security is best supported at the local food systems level. According to Hamm,<sup>38</sup> *community* food security is defined as

*a condition in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice.*

The preceding definition highlights the importance of food access, food safety, nutrition, sustainable agriculture, local food systems, culturally acceptable food, and social justice. Hamm goes on to describe seven operating principles of a healthy food system:

- Ensure community food security for all residents
- Be community based
- Be locally integrated
- Be reasonably seasonal in nature
- Present primarily opportunities rather than problems
- Connect “healthy” across the layers of the system, from people to soil
- Be diverse

The general focus of food security is placed on ensuring that food sources are as locally based as possible in order to promote self-reliance and a self-sustaining system. In sum, food security is linked to local foods through the assumption that local food systems improve access to foods and reduce uncertainty.<sup>24</sup>

This value placed on local foods—and in Alaska, this also includes traditional, wild foods—is evident in the Meter and Goldenberg report.<sup>5</sup> The authors' recommendations emphasize the need for resilient and self-sustaining local food systems, and recognize that small-scale incentives tailored to unique local characteristics will be more able to respond flexibly to changing conditions and rapidly evolving consumer needs<sup>5</sup>:

- Foster subsistence harvesting and related skills
- Build personal capacities in agriculture
- Expand agricultural production and gardening

- Build infrastructure that supports local food production
- Adopt state policy that supports local food production
- Focus consumer attention on staying loyal to Alaska grown food
- Expand food processing and manufacturing for in-state markets
- Strengthen internal food distribution networks
- Strengthen statewide transparency and coordination

The AFPC is one organization that has embraced these recommendations and is working to convince legislators that now is the time for a comprehensive food security agenda in the state. In the current climate of budget cuts, some types of progress can continue with little to no additional funding (which is appealing to those who rely on voters to keep their jobs). For example, the AFPC is advocating for continued empowerment of the Alaska Food Resource Working Group; the continuation of such programs as Farm to School and Nutritional Alaskan Foods to Schools (which, unfortunately, have recently found themselves on the chopping block); and enforcement of the 7% bidder preference for State of Alaska contracts (in which products harvested or processed in Alaska must be bought if the price is no more than 7% higher than products from outside the state). Additional recommendations for future consideration, and that will require funding, include consumer education programs like the “Eat Five, Buy Five” initiative that encourages residents to eat five servings of produce daily and buy \$5 of locally produced food each week<sup>5</sup>; the implementation of community food storage management systems and community foods templates to address supply chain vulnerabilities and encourage food entrepreneurial opportunities; structure of state and local land sales or leases to prioritize food production and attract beginning farmers; and supporting efforts to teach Northern growing methods, from school gardens to hands-on training on farms.

Surely, for all the unique challenges and distinctive beauties of Alaska, it has much in common with the Outside when it comes to ensuring current and future food security. Other states import similar percentages of food, and even though they have the advantages of shared borders and higher rates of in-state production, the current food security activities and recommendations for continued strengthening of the Alaska food system could be usefully applied elsewhere, and in some instances already have been. The United States as a whole is in the midst of a cultural and environmental food revolution, and it would be wise to adapt promising strategies and approaches regardless of their latitude of origin.

## NOTES

1. In this article, “food security” is used in the Alaska sense, captured best by University of Alaska researchers: “In the context that we use it here, food security describes more than merely whether sufficient food is being produced, or a one-size-fits-all food-nutrition relationship, and incorporates all of the various ways in which a food system supports health in its various biophysical, social, and ecological dimensions” (Loring and Gerlach, 2009). P. Loring and C. Gerlach, “Food, Culture, and Human Health in Alaska: An Integrative Health Approach to Food Security,” *Environmental Science and Policy* 12, no. 4 (2009): 466–78.

2. Z. Hughes, “Ammo Shortages Still Hampering Rural Subsistence Hunters,” *Alaska Public Media*, May 20, 2014, <http://www.alaskapublic.org/2014/05/20/ammo-shortages-still-hampering-rural-subsistence-hunters/> (accessed March 17, 2015).

3. L. Demer, “Backup Generator Headed to Tuluksak But May be Too Late for Thawing Freezers,” *Alaska Dispatch News*, November 13, 2014, <http://www.adn.com/article/20141113/backup-generator->



**headed-tuluksak-may-be-too-late-thawing-freezers** (accessed March 17, 2015).

4. "Food Aid Planned for Tuluksak," 2 KTUU, November 26, 2014, <http://www.ktuu.com/news/news/Food-Aid-Planned-for-Tuluksak/29786914> (accessed January 30, 2015).
5. K. Meter and M. P. Goldenberg, "Building Food Security in Alaska," Crossroads Resource Center for the Alaska Department of Health and Social Services, [https://akfoodpolicycouncil.files.wordpress.com/2013/07/14-09-17\\_building-food-security-in-ak\\_ken-meter\\_lr.pdf](https://akfoodpolicycouncil.files.wordpress.com/2013/07/14-09-17_building-food-security-in-ak_ken-meter_lr.pdf) (accessed January 30, 2015).
6. K. T. Stevenson, L. Alessa, A. D. Kliskey, H. B. Rader, A. Pantoja, and M. Clark, "Sustainable Agriculture for Alaska and the Circumpolar North: Part I. Development and Status of Northern Agriculture and Food Security," *Arctic* 67, no. 3: 271–95.
7. National Oceanic and Atmospheric Administration, *NOAA Fisheries Posts Statistical Report Card for U.S. Fisheries in 2011*, [http://www.nmfs.noaa.gov/stories/2012/09/09\\_19\\_12fisheries\\_of\\_the\\_us.html](http://www.nmfs.noaa.gov/stories/2012/09/09_19_12fisheries_of_the_us.html) (accessed January 30, 2015). V. Hanna, R. Frazier, K. Parker, and I. Ikatova, "2012 Food System Assessment," [https://akfoodpolicycouncil.files.wordpress.com/2013/07/2012-food-system-assessment-final-report-11\\_19\\_12.pdf](https://akfoodpolicycouncil.files.wordpress.com/2013/07/2012-food-system-assessment-final-report-11_19_12.pdf) (accessed January 30, 2015).
8. Alaska Department of Health and Social Services, Alaska Obesity Prevention and Control Program, *Alaska Obesity Facts Report*, May 2014, <http://dhss.alaska.gov/dph/Chronic/Documents/Obesity/pubs/2014AlaskaObesityFacts.pdf> (accessed January 30, 2015).
9. Although prices have recently plummeted across the United States and in urban Alaska, gas remains expensive in rural Alaska. Prices for a winter of fuel were set several months ago and future markets remain uncertain (ADN, 2015). L. Demer, "Bush Alaska Locked into High Gas Prices for Fuel Delivered Last Summer and Fall," Alaska Dispatch News, January 1, 2015, <http://www.adn.com/article/20150101/bush-alaska-locked-high-gas-prices-fuel-delivered-last-summer-and-fall> (accessed March 17, 2015).
10. J. Neyman, "Homegrown Revolution—Gardeners Expand to Tackle Alaska's Food Insecurity," *The Redoubt Reporter*, October 24, 2012, <http://redoubtreporter.wordpress.com/2012/10/24/homegrown-revolution-gardeners-expand-to-tackle-alaskas-food-insecurity/> (accessed January 30, 2015).
11. McDowell Group, Inc., Economic Value of the Alaska Seafood Industry, Alaska Seafood Marketing Institute, 2013, <http://pressroom.alaskaseafood.org/wp-content/uploads/2013/08/AK-Seafood-Impact-Report.pdf> (accessed January 30, 2015).
12. An official definition of "local" food does not exist. The definition applied herein is the one adopted by the U.S. Congress in the 2008 Food, Conservation, and Energy Act: The total distance that a product can be

transported and still be considered 'locally or regionally produced agricultural food product' is less than 400 miles from its origin, or within the state in which it is produced"; see S. Martinez, M. Hand, M. Da Pra, S. Pollack, K. Ralston, T. Smith, et al., "Local Food Systems: Concepts, Impacts, and Issues," ERR 97 (Washington, DC: U.S. Department of Agriculture, Economic Research Service, May 2010).

13. J. Ingram, "A Food Systems Approach to Researching Food Security and Its Interactions With Global Environmental Change," *Food Security* 3 (2011): 417–31.

14. V. Hanna, R. Frazier, K. Parker, and I. Ikatova, "2012 Food System Assessment," [https://akfoodpolicycouncil.files.wordpress.com/2013/07/2012-food-system-assessment-final-report-11\\_19\\_12.pdf](https://akfoodpolicycouncil.files.wordpress.com/2013/07/2012-food-system-assessment-final-report-11_19_12.pdf) (accessed January 30, 2015).

15. In terms of revenue generated (in the millions), the top products of Alaska farms in 2012 were ornamentals (\$13), hay (\$4.4), vegetables (\$3.3), miscellaneous livestock (\$2.8), potatoes (\$2.5), cattle and calves (\$1.7), dairy products (\$1.3), barley (\$1.0), hogs (\$0.2), and oats (\$0.2) (USDA ERS, 2012). USDA Economic Research Service, "Cash Receipts by Commodity," <http://www.ers.usda.gov/data-products/farm-income-and-wealth-statistics/annual-cash-receipts-by-commodity.aspx#.VQHkLGb1gt9> (accessed March 17, 2015); reported in Meter and Goldenberg, note 5.

16. P. Mills, "The Agricultural Potential of Northwestern Canada and Alaska and the Impact of Climatic Change," *Arctic* 47, no. 2 (1994): 115–23.

17. D. D. Davies, "Alaska's State-Funded Agricultural Projects and Policy—Have They Been a Success," Senior Thesis (Fairbanks, AK: University of Alaska, Natural Resources and Agricultural Sciences, 2007).

18. Agency of Commerce, Community and Economic Development, Nenana—Totchaket Resource Development Corridor Construction. (Nenana, AK: 2013).

19. P. Loring, S. Gerlach, and H. Harrison, "Seafood as Local Food: Food Security and Locally Caught Seafood on Alaska's Kenai Peninsula," *Journal of Agriculture, Food Systems, and Community Development* 3, no. 3 (2013): 13–41.

20. Northern Economics, *The Seafood Industry in Alaska's Economy* (Juneau, AK: Marine Conservation Alliance, 2011).

21. M. Elliott, *Pacific Salmon—U.S. West Coast Region*. (Monterey, CA: Monterey Bay Aquarium Seafood Watch, 2011).

22. C. D. Caster, *Assessing Food Security in Fairbanks, Alaska* (Fairbanks, AK: University of Alaska Fairbanks, Natural Resources and Agricultural Sciences, 2011).

23. "Outside" is a term commonly used by Alaskans to refer to anywhere outside the state.

24. S. Martinez, M. Hand, M. Da Pra, S. Pollack, K. Ralston, T. Smith, et al., "Local Food Systems: Concepts, Impacts, and Issues," ERR 97 (Washington, DC: U.S. Department of Agriculture, Economic Research Service, May 2010).
25. D. Joling, "High Tunnels Extend Alaska's Growing Season," Associated Press, May 31, 2014.
26. U.S. Department of Agriculture, *Household Food Security in the United States*, November 2009, <http://www.ers.usda.gov/Publications/ERR83/ERR83.pdf> (accessed January 30, 2015).
27. Alaska Section of Chronic Disease Prevention and Health Promotion (ASCDPHP), Chronicle No. 4, July 2008. Contributed by Charles J. Utermohle, PhD, Rebecca S. Wells, MS, Andrea, <http://dhss.alaska.gov/dph/Chronic/Documents/Publications/assets/ChroniclesV1-4.pdf> (accessed March 17, 2015).
28. D. Helfferich and N. Tarnai, "Alaska's Food (In)Security," *Agroborealis* 41, no. 1 (2010): 23–27.
29. K. T. Stevenson, H. B. Rader, L. Alessa, A. D. Kliskey, A. Pantoja, M. Clark, and J. Smeenk, "Sustainable Agriculture for Alaska and the Circumpolar North: Part II. Environmental, Geophysical, Biological and Socioeconomic Challenges," *Arctic* 67, no. 3: 296–319.
30. N. Fried and A. Shanks. "The Cost of Living in Alaska: How It's Measured, and How We Compare," *Alaska Economic Trends*, May 2011, 1–20.
31. Store-bought foods can also include healthy options such as fruits and vegetables, but price and quality can be factors limiting sale and consumption.
32. Changes in food safety regulations would have to be made for traditional slaughtering practices (e.g., processing the animal on the snow or ice cover) to be considered safe for preparing meat for sale at local groceries.
33. Alaska Department of Health and Social Services (DHSS), Alaska Obesity Prevention and Control Program, *Alaska Obesity Facts Report*, May 2014, <http://dhss.alaska.gov/dph/Chronic/Documents/Obesity/pubs/2014AlaskaObesityFacts.pdf> (accessed January 30, 2015).
34. Alaska Department of Health and Social Services (DHSS), "The Burden of Overweight and Obesity in Alaska: Summary Report," State of Alaska publication, 1–20 (2010).
35. A. M. Fenaughty, K. Fink, D. Peck, and C. J. Utermohle, "Prevalence of Overweight and Obesity Among Anchorage School District Students, 1998–2008," *Alaska Division of Public Health Section for Chronic Disease Prevention and Health Promotion Chronicles* 2, no. 1 (2009): 1–9.
36. M. Brubaker, J. Bell, and A. Rolin, "Climate Change Effects on Traditional Inupiaq Food Cellars," Center

for Climate and Health, Alaska Native Tribal Health Consortium (2009). Retrieved from [http://www4.nau.edu/tribalclimatechange/tribes/docs/tribes\\_InupiaqFoodCellars.pdf](http://www4.nau.edu/tribalclimatechange/tribes/docs/tribes_InupiaqFoodCellars.pdf).

37. B. Born and M. Purcell, "Avoiding the Local Trap: Scale and Food Systems in Planning Research," *Journal of Planning Education and Research* 26, no. 2 (2006): 195–207.

38. H. W. Hamm, "Principles for Framing a Healthy Food System," *Journal of Hunger and Environmental Nutrition* 4 (2009): 241–50.

---

©2015 Taylor & Francis Group · 530 Walnut Street, Suite 850, Philadelphia, PA · 19106

[http://www.environmentmagazine.org/Archives/Back Issues/2015/May-June 2015/alaska\\_full.html](http://www.environmentmagazine.org/Archives/Back Issues/2015/May-June 2015/alaska_full.html)