

TEACHING FOOD SYSTEMS IN ALASKA

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A

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## **Abstract**

The health of Alaska's food systems relies on the maintenance of food availability, food access, and food utilization overtime to ensure that food security exists. The *Teaching Food Systems in Alaska* educational modules were created to offer an opportunity to provide expert information and education to Alaska youth on the importance of food systems literacy in Alaska. The educational modules were created to engage youth in the food system. The goal is to inform and educate Alaska youth about food systems in Alaska through the development of a series of educational learning modules organized to address the three primary components of the food system: food availability, food access and food utilization. The modules created could potentially serve as a foundation for the development of future modules, the creation of a formal food systems literacy course or certification program, and/or to seek future funding to support the creation of a future program.

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## **Chapter 1: Introduction**

The “food system” refers to the complex road, or chain, of how food is produced to how it ends up on the consumer’s plate. Food systems include various components of nutrition, food, health, community, economic development and agriculture (Cornell, 2014). More specifically, food systems include the activities involved in how food is produced, harvested, processed, packaged, transported, distributed, marketed, and consumed, and how food materials and waste are disposed of (Cornell, 2014; Ingram, 2011). The food system is influenced by social, political, economic and natural environments, and is dependent on human resources that provide labor, research and education (Cornell, 2014). In many instances, people use the phrase “farm-to-table” or “field-to-plate” to refer to the activities and actors that play a part in the food system. Essentially, a food system encompasses everything from food production onwards to waste disposal and recycling.

All food systems have challenges related to the availability of food, access to food, and utilization of food—the stability, or instability, of these factors relate to a food system’s health and overall food security. How food is grown, harvested, processed, transported, consumed, and disposed of are all issues that exist in varying degrees on the local, state, national, and global levels. Environmental transitions associated with climate change, such as the retreat of seasonal sea ice, landscape drying, shifts in changing of seasons, and changing patterns of animal migrations are global phenomena also having a significant impact on how food is grown, harvested, and accessed (Loring & Gerlach, 2008). To deal with these changes, there is a need for action, innovation and forward-thinking. A healthy, resilient, and sustainable food system can mean healthier individuals and social ties, healthier communities, and a stronger economy. Addressing weaknesses and instability in the food system can offer overall improved food

security and food system health. A healthy food system ensures that food is produced, distributed and exchanged in an efficient manner; food is allocated evenly and affordable; and food is nutritionally valuable, socially acceptable and safe (Ingram, 2011).

The challenges that exist in Alaska's food system include delicate food production and distribution mechanisms that are vulnerable to external disturbances (Meter & Goldenberg, 2014; Donovan & Snyder, 2013). Food affordability is a barrier in many Alaskan communities especially with respect to access to nutritious, healthy, and desirable foods. The unique environment that supplies many of Alaska's populations with foods hunted, fished, or gathered has been challenged by environmental transitions, and with regulations and policy changes regarding foods harvested from the wild (Meter & Goldenberg, 2014, Loring & Gerlach, 2008). There is a need for interventions that will address the challenges that exist in Alaska's food systems.

**Strengths: What is Working Here and Now?**

Currently, there are many efforts, initiatives, and innovative programs happening around the State of Alaska that address issues of food availability, access to food, food utilization, food security, and food skills education at the individual, community and state levels. Some examples include, the formation of food policy councils and local food networks that are comprised of stakeholders and experts focused on nutrition, food security, gardening, agriculture, and food policy change in Alaska. Farmer's markets; fish-to-schools programming; boat-to-consumer businesses; and community gardens and composting centers. Many communities have taken advantage of more established programs that are nationally government-funded, such as the Farm-to-Schools program. In some rural communities "culture camps" are held to promote the preserving of traditions and culture amongst Alaska Natives and include the processes

surrounding traditional food harvesting and processing. There appears to be a desire and interest by Alaskans to have more control over their food, to be more involved in their food system, and to improve food security (Donovan & Snyder, 2013). This interest is demonstrated by a number of Alaska food initiatives and activities currently taking place throughout the state.

For example, the nationally supported Farm-to-Schools program has been operating in Alaska for several years. This program operates throughout the United States and in each state the program is tailored to meet the unique needs relating to geography, weather, community, and culture (State of Alaska, 2013). The Alaska Farm-to-Schools Strategic Plan (2011) program goal is *“having product produced and/or harvested in Alaska available in the school food environment and youth in a position to take advantage of it”* (p. 1); and, their objective is to *“increase the procurement and use of food grown in the state by public schools”* (p. 1). The program offers an opportunity for educators and students of all ages to have increased access to information relating to the production and distribution of food; as well as educating youth on where their food comes from and how their food choices affect their health, environment and community (State of Alaska, 2013). Activities have included increasing the sale of local foods to school districts, accelerating the development of school garden programs, providing technical assistance for school staff members, facilitating farm tours, and organizing cooking classes using local foods, as well as offering youth education and training (State of Alaska, 2013). Grants are available to offer support for small school-based programs and pilot programs relating to agriculture. The Farm-to-Schools program encourages the inclusion of individuals and professionals from across the state ranging from farmers, fishermen, healthcare professionals, professional chefs, and student volunteers (State of Alaska, 2013).

Another program operating in Alaska is the Calypso Farm and Ecology center. A non-profit organization and educational farm based in interior Ester, Alaska offers a variety of hands-on educational activities to anyone interested and also produces vegetables, herbs, and flowers (Calypso, 2016). Their mission is to “*encourage local food production and environmental awareness*” (Calypso, 2016, para. 3). Their educational activities include field trips that offer information on subjects such as growing food in Alaska, food and the ecosystem, or applying mathematics to gardening skills (Calypso, 2016). They offer workshops on practical skills such as growing vegetables from seeds and starts, organic gardening and planning a home scale food production garden (Calypso, 2016). There is also a formal farmer training program that teaches skills for individuals to be able to grow their own food and raise their own livestock. The Calypso Farm operates as a Community Shared Agriculture (CSA) which offers “shares” at the beginning of the year to consumers who pay a set fee and receive produce throughout the growing season and offers a direct relationship between consumer and producer (Calypso, 2016).

The Sitka Local Foods Network is a non-profit group in Sitka, Alaska, which is in the southeast region of the state. It is a remote island with a relatively small population. This local food network is a result of a health summit that was held where community members decided on supporting a local foods oriented project (Sitka Local Foods Network, 2016). The community expressed an interest in a public market so that there could be improved access to locally produced food and locally harvested fish. The Sitka Local Foods Network was created in order to provide structure and direction in implementing these ideas through the expansion of local, community, and family gardening, the implementation of a farmer’s market, growing produce to be sold at the market but also to local schools, providing expertise and support for future food initiatives, and supporting the safe harvest of traditional and subsistence foods (Sitka Local Food

Network, 2016). The farmer's market has grown into an event where locally grown produce and locally harvested fish are sold, but also food stuffs made from locally produced and harvested foods. Quest cards through the Supplemental National Assistance Program (SNAP) are accepted so that all community members may have access to local foods (Sitka Local Foods Network, 2016). The group has also conducted a local foods assessment, planted over 200 fruit bearing trees in the community, and participates in other food initiatives in the state in collaboration with other organizations such as advocating for continued funding for foods programs and initiatives (Sitka Local Foods Network, 2016).

There are also efforts being made to address food security in Alaska by trying to alleviate food insecurity and hunger. The Food Bank of Alaska is a non-profit program that operates out of Anchorage but serves the entire state. The Food Bank collaborates with partners in the food industry (e.g., grocery stores, wholesalers, farmers, fisherman, and farmer's markets) to collect food stuffs that would otherwise be disposed of and re-distributes it to food pantries, soup kitchens, senior centers and other groups that serve the hungry and food insecure (Food Bank of Alaska, 2016). They also accept food that is donated from the community through food drives. The food is stored in a warehouse and transported by truck to those organizations that need it. Additionally, they operate a mobile food pantry to distribute food that is highly perishable in Anchorage (Food Bank of Alaska, 2016). The food bank members are also involved in advocating to elected officials for public policy changes that could improve conditions for the food insecure and hungry (Food Bank of Alaska, 2016).

The Store Outside Your Door initiative is an educational program that was created with the support of the Alaska Native Tribal Health Consortium (ANTHC) to promote the need for Alaska Native populations to consume more traditional and socially valuable foods as an

approach to improved health, nutrition, and wellness (ANTHC, 2014). Videos are filmed to highlight traditional foods, traditional foods practices, and traditional foods preparations from various regions in the state. Each video takes the viewer out to harvest from the "Store Outside Your Door" then into the kitchen to learn how to prepare a healthy traditional meal in a contemporary context. Many rural Alaska communities, which are predominantly Alaska Native, lack access to healthy food options in their grocery stores, and program activities address these limitations. In order to improve access to healthy and nutritious food, the Store Outside Your Door's mission (ANTHC, 2014) is to "*promote foods which are hunted, fished, gathered, or grown in Alaska as the healthiest option for the Alaska Native diet*" (para. 4).

Other activities and actions being taken can be seen through the formation of food policy councils. For example, the Alaska Food Policy Council (AFPC), a non-profit organization, was formed by stakeholders in Alaska's food system in 2010, and their purpose is to advocate for access to affordable, healthy, local foods; supportive business environments; a strong workforce for Alaska's food-related industries; and sustainable local food systems (AFPC, 2012). In 2014, the AFPC commissioned a report on the state of food security in Alaska to inform priority development and policy recommendations. The report identified the need for increased food-related youth education and workforce development so that current and future generations of Alaskans are prepared to meet the growing demands in food production, procurement, distribution, and access (Meter & Goldenberg, 2014). Professionals working for, around, and within the food system will also need to be equipped with a science and engineering knowledge-base to innovatively address the challenges that come with climate change, geographical remoteness, and Arctic conditions. It is also a crucial component to include the integration of Alaska Native knowledge and food practices with Western science methodologies to further

support the development of a workforce equipped to protect the uniqueness, and improve the resiliency, sustainability, and robustness, of Alaska food systems. The local foods that are consumed in Alaska are most often harvested through subsistence gathering, and as an integral part of Alaskan culture it is necessary to protect these subsistence foods that are socially and culturally valuable (Meter & Goldenberg, 2014). This can be done by fostering subsistence harvesting skills, supporting educational programs that teach these skills, and protecting the current knowledge that exists by supporting leaders and experts in subsistence food gathering and harvesting (Meter & Goldenberg, 2014).

### **Challenges: What Can We Do Now?**

Decision-makers, individual citizens, community groups, and government agencies within the state are taking action, coming up with innovative solutions, and looking to the future of food and how to keep Alaskans fed. Steps have been taken to create an informed citizenry that has a desire to participate in strengthening Alaska food systems, but there is always more work to be done. Recommendations from the food security report commissioned by the AFPC, as well as a report of similar scope commissioned by the Rasmuson Foundation, have come to some similar conclusions and recommendations on how to address food security challenges in Alaska (Meter & Goldenberg, 2014; Donovan & Snyder, 2013):

- Build personal capacities in agriculture. Create a culture of food production and education to teach individuals about growing, harvesting, preserving, preparing food.
- Fill gaps in formal training and education regarding food systems for youth. Increase educational opportunities to engage youth as current and future consumers.

- Build Alaska’s food-related workforce and increase the number of Alaskans taking part in food-related educational and degree programs.

There is no one-size-fits all approach, nor a single solution, to food security and food system challenges in Alaska, but one component is to provide education and training for those that will be consuming, participating, and impacting the future food system.

Food literacy is a concept that has become increasingly relevant in discussions relating food systems and improving food security. There are varying definitions as to what food literacy precisely is, though it generally refers to having knowledge about where food comes from; how it is produced and harvested; how it is accessed; regulations relating to it; and understanding the impact food choices have on individual, community, environmental and economic health (Cullen et al., 2015; Withers & Burns, 2013). Being informed about the complexities and challenges in the food system as well as understanding the different components of food systems is important to increasing food security (Withers & Burns, 2013). Individuals need the knowledge to process basic information about food so that they can make decisions that may improve individual health, nutrition, and dietary outcomes as well as contribute to the overall security and stability of the food system (Cullen et al., 2015; Withers & Burns, 2013). One example of a type of program that teaches food literacy is the school garden, or “learning garden”, that serves as a “living laboratory” (Withers & Burns, 2013). Educating individuals about what it takes to grow food, harvest food, and process it can help individuals become more self-sufficient, and can increase their food security, but may also make the more active participants more engaged citizens that make choices that support the health of their food system (Cullen et al., 2015; Withers & Burns, 2013). Supporting food literacy education that teaches food systems knowledge, skills, and practices can empower individuals to engage in the food system as future

leaders in developing secure, sustainable food systems (Wither & Burns, 2013). Further, food systems literacy can assist Alaskans in making educated decisions as voters and consumers on such topics as food availability, access, utilization, self-reliance, and sustainable food practices.

## Chapter 2: Review of the Literature

### Food Security

When discussing food systems and food issues in Alaska, as well as on the national and global levels, the definition of what food security is has to be explained. The World Health Organization (WHO, 2016) defined food security at the 1996 World Food Summit as existing “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life”. The United States Department of Agriculture (USDA) similarly defines food security and further identifies ranges of food security. The USDA’s Economic Research Service has labeled and defines the ranges of food security as follows (USDA, 2015):

*High Food Security:* a household that does not report any barriers in access to food.

This includes food preferences, variety of food choices, and no anxiety of where food will come from.

*Marginal Food Security:* Some reported indicators of food barriers such as fear of food shortages or a lack of sufficient food. There is minimal change in diet or food intake.

*Low Food Security:* Diet has reduced quality, variety, and preference. There is minimal reduction in food intake.

*Very Low Food Security:* Multiple indicators of disrupted food access and eating patterns.

A reduced food intake exists” (USDA, 2015, “Ranges of Food Security and Food Insecurity”, para 1).

Those households with low food security and very low food security are considered food *insecure*. The USDA (2015) defines food insecurity as “a household-level economic and social condition of limited or uncertain access to adequate food”. Food insecurity and hunger do not

necessarily co-exist, but hunger is defined as “an individual-level physiological condition that may result from food insecurity” (USDA, 2015).

Food security in Alaska can have varying meanings from the more commonly used definitions of what food security is, especially as defined by those in other states. In the “Lower 48” food security often refers to having a secure food supply and having the ability to produce food for oneself, particularly in lower income households and communities [Institute for Social and Economic Research (ISER), 2012]. In Alaska, food security also commonly refers to having a food supply that is protected from disruption from weather, political upheaval, or a breakdown in the supply chain (ISER, 2012).

The Alaska Inuit Circumpolar Council (ICC) recently commissioned a technical report that defined food security within the framework of the Inuit perspective. In this context, food security is primarily defined as function of the health of the environment (ICC, 2015).

Indigenous Knowledge (IK) is a way of thinking that applies to the biological, physical, cultural and spiritual systems, which includes food security (ICC, 2015). Indigenous Knowledge is a key component in the food system and teaches that the Arctic ecosystem encompasses the relationship communities have with different components of that ecosystem; language teaches when, where and how to obtain, process, store and consume food; sharing food with individuals and the community is a significant part of food security; and there are rights to govern how food is obtained, processed, stored and consumed (ICC, 2015). Alaskan Inuit food security is characterized by six dimensions: availability, Inuit culture, decision making power and management, health and wellness, stability and access (ICC, 2015). These components also include “the spirit of everything”, or the influence of social, cultural, spiritual, political and natural environments, and having food sovereignty (ICC, 2015).

Upwards of 12% of Alaska households report being food insecure, which is comparable to the national average of 14% (USDA, 2015). Over 100,000 Alaskans struggle with hunger (Feeding America, 2015). The rural regions of Alaska have the highest rates of food insecurity, though urban areas have the highest numbers of food insecure individuals (Donovan and Snyder, 2013). Alaska Natives are twice as likely as non-Natives to be food insecure, and approximately 20% of children in Alaska are food insecure (ASCDPHP, 2008).

Food security and insecurity are the outcomes of a healthy or unhealthy food system, respectively. A healthy, secure food system relies on the stability of three categories over time (Ingram 2011):

- ***Food Availability.*** Production, distribution, and exchange.
- ***Access to Food.*** Affordability, allocation, preference and/or cultural appropriateness.
- ***Food Utilization.*** Nutritional value, social value, safety.

### **Food Availability**

Alaska is a vast state with most communities being inaccessible by road. Supplies not caught, hunted, harvested, or grown have to be driven in, flown in, or put on boats or barges to reach consumers. It is estimated that 95% of food purchased in Alaska is imported from out-of-state, and although other states in the “Lower 48” also import similar percentages, they export more food as well, meaning they have a potential source of food if the imports were delayed or stopped altogether (Helfferich & Tarnai, 2010). Further, the distance the goods imported to Alaska have to travel is significant and if ever transportation was slowed or stopped for any reason it is estimated that stores have only three days’ worth of supplies on their shelves (Helfferich & Tarnai, 2010). In 2009, Redoubt Volcano erupted, causing flight disruptions due

to ash, impacting local commerce in Anchorage and surrounding communities (Alaska Volcano Observatory, 2014). Although the physical impact on communities was overall relatively minor, there were significant shipping delays that caused shortages in food supplies and floral deliveries in some communities (Alaska Volcano Observatory, 2014).

The transportation of food can also be disrupted by relatively common occurrences such as a failing engine or inclement weather that prevents aerial and/or marine travel. In January 2016, a barge that regularly runs between the Port of Tacoma in Washington and the Port of Anchorage was delayed due to mechanical issues, which caused shelves to be bare in many communities (Zak, 2016). Approximately, 90% of the food imported into Alaska has to travel through Anchorage which makes the communities relying on those food routes further vulnerable to disruptions (Zak, 2016). The delay lasted only a few days but markets and grocers in Anchorage and Fairbanks reported that refrigerator and freezer shelves were bare, dry goods such as boxed and canned foods ran low, and some reported running out of fruit completely (Zak, 2016). This small delay illustrates how vulnerable Alaska is in the event of a major disruption in food delivery.

**Farming in Alaska.** Alaska ranks last in the nation for agricultural production, with just over \$30 million in agricultural products produced between 2003 and 2012 (ISER, 2012). Approximately, only 5% to 10% of food consumed in Alaska is grown or harvested in Alaska, and \$1.5 billion was spent on imported food in 2007 (ISER, 2012). According to the USDA's census on agriculture (2015), there are 750 farms in Alaska and the average age of farmers is 57 years, with the majority of all farmers being over the age of 45 (USDA, 2015). The population of farmers is aging and few young people are gaining the knowledge, skills, and training to become farmers in the future (Meter & Goldenberg, 2014; USDA, 2015).

Farming has had historical success in Alaska and currently is relatively successful on the small scale (Loring & Gerlich, 2009). Despite poor soils in many areas, a short outdoor growing season, permafrost, extreme weather events, wildlife, and competition from outside the state, Alaska is able to produce crops of value (Loring & Gerlich, 2009). In 2010, the most significant revenue came from greenhouses/nursery crops, hay, cattle, potatoes, and dairy products (ISER, 2012). Approximately \$14 million of the \$30 million produced in 2012 was intended for human consumption, and approximately \$2.2 million was generated in farm-to-table sales (ISER, 2012). There are currently over 30 farmer's markets in Alaska and there is a growing interest in farm-to-table opportunities (Donavan & Snyder, 2013).

Challenges that Alaska farmers and growers face include a need for increased efficiency (in terms of growing and distributing) and improved infrastructure (e.g., for storage, processing, and transport). For example, creating more energy-efficient greenhouses could reduce heating costs, and by utilizing novel environmental resources there may be opportunities to increase the production of crops, such as in utilizing geothermal energy to heat greenhouses (Meter & Goldenberg, 2014). Such innovations would provide an opportunity for year round growing and broadened access to specialty crops. Improving infrastructure is also important for farmers and growers, as without the proper facilities, food stuffs will be more likely to go to waste (Meter & Goldenberg, 2014). Further, there is also a need to support skills training and education relevant to food production as a way to promote workforce development in agriculture. These challenges are not impossible to overcome and there are efforts being made around the state to address these issues. For example, Cooperative Extension at the University of Alaska Fairbanks has many programs that promote agricultural education, such as gardening and sustainable agriculture practices, to youth and adults (UAF, 2014).

There are limited options for food procurement and production in the most remote regions of Alaska. Some of the challenges that may present barriers are a lack of employment opportunities, a lack of start-up capital for food procurement and production, the economic burden of bringing supplies from urban centers, poor soil, and a lack of food procurement and production knowledge (Loring & Gerlach, 2008). Rural communities are also more susceptible to food insecurity than urban centers by the very nature of being so remote; and weather is often a significant factor in supplying communities with goods that might be required in the process of growing and producing food. However, these barriers can often be overcome with small improvement efforts, and in many cases there are opportunities for food procurement and preparation processes to be successful. This is so for both rural and urban areas in Alaska.

Arctic Harvest Deliveries is a food distribution business run by Kyla Byers in Anchorage (Alaska Public Media, 2015). This small business operates by picking up produce from different growers in the Matanuska Valley and delivering the produce the same day to restaurants and Community Supported Agriculture (CSA) subscribers (Alaska Public Media, 2015). The restaurants and CSA subscribers have an opportunity to purchase produce that is locally produced, fresh, and supports local economies both on the production side and distribution side. This is one example of a business venture on a small scale that can support local food systems and connect individuals to healthier, fresher food.

In 2012, the “Tyonek Grown” agricultural program was established in Tyonek, Alaska by the Tyonek Tribal Conservation District in collaboration with the Native Village of Tyonek to enhance food security and provide organic, fresh produce to the community (TTCD, 2016). The program began with a small community garden that has grown into a 1.5 acre production that has 15 raised beds, solar powered irrigation and ventilation systems, 2 high tunnels, 1,000 row feet

of potatoes, 45 rhubarb plants and 15 raspberry bushes, and produces crops that include: tomatoes, corn, pumpkins, zucchini, spinach, and celery (TTCD, 2016). The program has a gardening education program that involves Tyonek youth in the growing, harvesting, and distributing the foods grown. The produce is distributed through the Tyonek Farmer's Market, the Tyonek Elders Lunch Program, and at Anchorage markets (TTCD, 2016). The Tyonek Tribal Conservation District leased land from the Native Village of Tyonek, which made it possible to expand and grow the Tyonek Grown farm.

The Sitka Kitch is a project that was started in collaboration with multiple community organizations, including the Sitka Conservation Society, to support local food economies, in Sitka, Alaska. The purpose of Sitka Kitch is to increase local food production and distribution and foster a more sustainable food system by promoting entrepreneurial development for small businesses developing new products based on local resources (Sitka Conservation Society, 2016). Sitka Kitch also provides the public access to a community kitchen and offers space available for rent for food related educational classes and technical skills training. Examples of classes that are offered include food safety and handling practices, basic culinary skills, and cooking from scratch (Sitka Conservation Society, 2016). The space can also be utilized for small businesses that need a commercial kitchen to prepare and process foods for distribution, such as a catering business. It offers an opportunity for food related business innovation that might not be able to come to fruition without access to space, education, and/or resources.

**Commercial fishing in Alaska.** Commercial fishing is a significant industry in Alaska, and the products are in high demand on the international market. Salmon, halibut, black cod, shrimp, and King Crab are some of the seafood harvested by commercial fishermen, and in 2010 Alaska exported \$1.8 billion worth of seafood (ISER, 2012). Approximately 60% to 70% of

Alaska seafood is sold to export markets (ISER, 2012). Commercial fishing in Alaska is one of the most regulated industries in the state, with local, state, and federal agencies monitoring the resource to ensure that it is sustainable into the future. Some currently employed fishing practices result in large numbers of by-catch, which ultimately puts a strain on marine resources. For example, the groundfish trawl fisheries have had significant impacts on salmon populations due to the nature of how groundfish are caught. Trawling boats dredge along the bottom of the ocean and essentially catch everything in their path, including salmon, which are disposed of (ISER, 2012).

There are a limited number of commercial fishing permits, which is intended to regulate the number of fishermen. Approximately 77% of permit holders claim Alaska residency, meaning the remaining 33% do not live in the state (State of Alaska, 2016). This may mean that those non-residents do not support or contribute to local and/or rural economies and it means less permits being held by Alaskans. The average age of commercial fishing permit holders is 49.7 years, and the number of Alaskan residents under the age of 40 that hold permits has fallen from 38.5% to 17.3% since 1980 (Alaska Marine Conservation Council, 2016). There is concern that as permit holders who reside in Alaska get closer to retirement age and there are not as many young people becoming permit holders, the consequences may have a negative impact on local and rural seafood economies (Alaska Marine Conservation Council, 2016).

The majority of seafood caught in Alaska is sent outside the state for processing. Salmon caught in Alaskan waters may be sent to Seattle and then even on to China for processing before it is sent back to the United States, including Alaska, for commercial consumption (ISER, 2012; Seattle Times, 2005). Ideally, seafood caught in Alaska that is intended for consumption in-state would not have to be sent to Washington, California, or overseas to be processed, but there are

factors that have to be considered in the processing and distribution of Alaska's seafood. The cost of sending fish to be processed in China (boned, skinned, fileted) is often cheaper than having it done in the United States because of cheap labor costs, and seafood regulations for national retail grocery stores can be rigorous, which requires accuracy and consistency in the final product (Seattle Times, 2005). There is also a lack of processing plants for seafood in Alaska, which requires the seafood be sent to plants in Oregon, Washington, and beyond.

It does seem that there is a growing desire to have a direct supply chain of Alaskan seafood from boat-to-consumer, and there are efforts in the state that address consumer desire to have locally caught seafood as well as supporting local seafood economies. The Sitka Salmon Shares is an example of a small seafood processing and distribution business that is working to strengthen local seafood economies in southeast Alaska. It is a Community Supported Fishery (CSF) that members in the mid-west subscribe to, or buy "shares", and receive seafood throughout the fishing seasons (Sitka Salmon Shares, 2016). There are 12 fishermen who are a part of the Sitka Salmon Shares, and they catch the seafood; it is processed in a processing plant in Sitka, then distributed to a seafood "hub" in different locations in the Midwest, and then trucked to members' front steps (Sitka Salmon Shares, 2016). Seafood that is available includes King Salmon, Coho Salmon, Sockeye Salmon, Lingcod, Black Cod, Spot Prawns, and other products. This example is one that still exports seafood out-of-state but it supports local seafood economies in the state.

Another example of a program that enhances access to local seafood is the Fish-to-Schools program, also in Sitka, Alaska. This initiative was started in 2010 after a community health summit was held where community members decided that they wanted to increase local food use in the Sitka School Districts. The Sitka Conservation Society in partnership with the

Sitka School District began implementing the Fish-to-Schools lunch program preparing and serving local fish at least twice a month (Sitka Conservation Society, 2016). The program still exists and serves locally caught rockfish and salmon to grades 2 to 12 (Sitka Conservation Society, 2016). The Sitka Conservation Society created a Fish-to-Schools guidebook that offers a “how to” for implementing a similar program in other school districts by providing procurement and processing strategies, legalities, recipes and “tips” (Sitka Conservation Society, 2016). A Stream-to-Plate Curriculum was also created as an accompaniment that educates students on salmon, their lifecycle, connection to the environment and ecosystem, and their relationship to human health. The Fish-to-Schools program addresses improving child nutrition, education on local seafood, the importance of community and food systems sustainability (Sitka Conservation Society, 2016).

### **Access to Food**

Foods imported to Alaska travels long distances and may take extended periods of time to reach their final destination. This can have a negative impact on the quality of fresh foods, such as produce. Fruits and vegetables grown in California may take days to reach a destination in rural Alaska, and by the time they get to a store shelf and then to consumers they are often wilted or sometimes spoiled. Often produce is exposed to harsh weather during transit and may freeze or become moldy from moisture, which can reduce the nutritional value of the food, as well as the desirability to purchase it. Once food stuffs get to rural Alaskan communities, healthier food items can be cost prohibitive and processed foods that are not nutritionally rich are often the cheapest and easiest choice (ISER, 2012). The cost of food items in all of Alaska can range from 20% to 170% higher than in a typical city in the Lower 48 such as Seattle, WA or Portland, OR

(Alaska Division of Public Health, 2008). Having access to desirable, consumable, nutritious foods can be a challenge for many of our states' communities.

Subsistence activities still remain one of the primary sources of local foods for all Alaskans (ADFG, 2016; Loring & Gerlach, 2008). Subsistence includes hunting, fishing, and gathering from the environment, and subsistence foods include: salmon, halibut, herring, whitefish, moose, deer, caribou, bear, birds, shellfish, plants and berries (ADFG, 2013; Meter & Goldenberg, 2014). In 2012, 50 million pounds of wild food were harvested, and of that 37 million were harvested in rural areas with the rest being harvested by urban residents (ADFG, 2013). The breakdown of harvest includes: 52% fish, 23% land mammals, 14% marine mammals, 4% plants, 3% birds, and 3% shellfish (ADFG, 2013).

Alaska Natives and non-natives alike rely heavily on their environment, and the processing of wild caught/harvested foods is another important element in food knowledge. There are communities where culture camps have been organized to invite young people to engage in their culture and traditions, as well as learn the skills required to harvest and process wild foods. In Kake, Alaska located in the southeast region of the state, young people from kindergarten to seniors in high school spend one week in the summer camping at culture camp learning how to hunt, harvest, prepare, and process wild foods (Organized Village of Kake, 2016). Many foods, such as seal, black bear, moose, deer, and fish are donated from local fisherman and hunters. Other wild foods such as berries, beach greens, seaweeds, and gumboots are harvested by the campers. Activities include skinning and butchering, smoking, canning, preserving, pickling, and preparing the foods safely (Organized Village of Kake, 2016). Culture camp addresses many social, cultural, and health issues in the community. Unemployment rates are high in Kake, and store bought food is expensive, so teaching young people how to live off of

subsistence foods can enhance their food security, as well as offer improved access to healthy, fresh, local foods. This type of food literacy programming can provide skills training and education that can help strengthen the sustainable use of the state's subsistence food system.

The cultural and social transitions that need to be considered when discussing preference and cultural appropriateness of accessible food is important in all of Alaska's communities, such as in rural communities which have higher Alaska Native populations (Loring & Gerlach, 2008; Meter & Goldenberg, 2014). Consuming traditional foods and engaging in subsistence activities is a way to celebrate the maintenance of traditions, to connect to the land, have social networking, and have a place of belonging and kinship through the sharing and exchanging of foods (Loring & Gerlach, 2008; Meter & Goldenberg, 2014). With the cost of groceries and food stuffs continuing to remain high throughout much of the state, increased regulations on fishing and hunting, climate change and the adoption of a more Westernized diet, many Alaska Natives consume less wild, traditional foods than previous generations, and sometimes engage in fewer traditional activities than in the past (Loring & Gerlach, 2008).

### **Food Utilization**

The food environment impacts how people use food and that relationship has effects on individual and community health. As discussed previously, having a healthy food system requires stability in food availability, access to food and food utilization. Just having access to available food does not mean one has food security (Snyder & Meter, 2015; Ingram, 2011). A healthy food system requires that food is healthy, nutritious, socially/culturally relevant, and safe to consume (Snyder & Meter, 2015).

The top five leading causes of death in Alaska are cancer, heart disease, unintentional injury, stroke and chronic respiratory disease, three of which are largely chronic diseases that can

be prevented or addressed through healthy behaviors such as eating healthfully (ADHSS, 2014). Sixty-seven percent of Alaskan adults are obese or overweight, and 26% of high school students are obese or overweight (ADHSS, 2013). The approximate direct medical cost of treating conditions related to overweight/obesity in Alaska is \$459 million per year (ADHSS, 2013). It seems likely that, in order to address chronic disease in Alaska, access to healthy foods in communities is an essential component to preventing chronic disease and improving health. For example, the consumption of fresh produce, such as fruits and vegetables, and the avoidance of processed foods have been shown to reduce the risk of an individual being overweight or obese, and has been associated with chronic disease prevention (ADHSS, 2014). In Alaska, approximately 80% of adults and 85% of high school students do not consume the recommended daily servings of fruits and vegetables, and those in rural Alaska are significantly less likely to consume fruits and vegetables (ADHSS, 2014). As previously discussed, in Alaska's rural communities the foods that are imported are very expensive to purchase and the items that are more affordable are often over-processed, high in fat, high in calories, and low in nutritional value (Loring & Gerlach, 2008). Consuming more unhealthy foods naturally lends itself to an individual being at greater risk for being unhealthy and overweight. Further, research has shown a correlation between transitions in community foods systems and negative individual health. This can be observed in populations that traditionally lived a more subsistence lifestyle comprised of wild foods that were harvested, hunted, or caught but who have been forced to consume less of these foods for reasons such as a decrease in animal populations or changes in hunting and fishing regulations (Loring & Gerlach, 2008).

In consideration that many Alaskans enjoy traditional and subsistence foods lifestyles, there are associated risks that must also be addressed to ensure food safety and public health.

Unsafe food preservation practices in Alaska, such as improperly fermenting wild game or fish, use of improper canning methods, consuming unregulated shellfish, and improper storage of wild game or fish can (and does) lead to food borne illnesses (State of Alaska, 2016). However, the benefits of consuming foods that are socially important and healthy when handled and processed correctly can outweigh the risks. Education on food safety and proper processing and storage methods can remedy those issues.

### **Moving Toward a Healthy Food System**

Hamm (2009) outlines seven principles for moving towards a healthy food system while acknowledging that a perfect food system is unlikely; what we can do is strive for improvement rather than perfection. The seven principles provide a web of support and should interact with one another and not act independently (Hamm, 2009):

- ***Ensure community food security for all residents.*** All community residents should have access to “*culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice.*”
- ***Be community based.*** Includes “*networks of people and institutions within the community that are helping to insure everyone in their community is food secure and that resources are stewarded for both present and future generations.*”
- ***Be locally integrated.*** Food products will be “*a dynamic blend of local, regional, national, and global supply.*” Ideally, one would choose local food first, if not available, then regional and so on.

- ***Be reasonably seasonal in nature.*** Consumers should be mindful when purchasing fruits and vegetables and try to choose those in season or come up with innovative solutions in growing their own fruits and vegetables.
- ***Present primarily opportunities rather than problems.*** Opportunities from a healthier food system may be economic development opportunities. Producing healthier foods can increase fruit and vegetable consumption, which can lead to improved diet and health of individuals, groups, and communities.
- ***Connect healthy across the layers of the system.*** Healthy layers do not exist on their own but across a system, in both directions. Individual health supports group health which supports community health.
- ***Be diverse.*** Supporting diverse modes of food production, distribution, utilization will offer a more robust food system. For example, support the development of small, medium, and large farms.

Hamm (2009) argues that enhancing food security for all residents does not suggest a strictly local diet since social and cultural transitions require access to foods that are preferred and culturally acceptable. For example, Filipino populations in an urban environment in Alaska may not have access to some of the fruits, vegetables and other food stuffs that are culturally preferred and they may have to choose foods that are less healthy. This is where the global food supply chain can be a benefit to improved food security. This is where he also contends that instead of supporting solely “local” food, “locally integrated” food is preferred (Hamm, 2009). He furthers that it is unlikely that communities will ever achieve, or desire, only foods that are locally sourced; choosing foods that are local, regional, and global is more reasonable for a healthy food system (Hamm, 2009). Hamm (2009) also goes on to argue that choosing foods

that are “*reasonably seasonal in nature*” is not meant to imply that foods in season are the only foods that should be consumed, but that considering seasonal locally produced foods might be one way to make choices that may support a sustainable food system. He also supports a community-based food system approach where networks of people and institutions work in collaboration with their natural resources to improve food security and utilize the food system as a tool for improving the health of the community (Hamm, 2009). This approach capitalizes on the existing resources and assets in a community who have an invested interest in the community’s health. Further, a food system that provides opportunities for business growth and for the production and distribution of healthy foods can improve food security and health of a community (Hamm, 2009). For example, the creation of small businesses that grow fruits and vegetables can improve the health of a community because it may improve their access and consumption of fruits and vegetables (Hamm, 2009). “*Connect “Healthy” across the layers of the system*” is the idea that health is a multi-layered concept and a healthy food system must include a healthy environment, healthy people, and healthy food; not just health in one aspect (Hamm, 2009). And, finally, a healthy food system should support diversity in food production and distribution and in the growing of small, middle, and large scale producers and distributors (Hamm, 2009). Diversity can support a healthier food system by offering a “safety net” if small, local producers do not succeed or if one mechanism in the food system is not functioning. These principles do not suggest a model for a healthy food system but as a guide to identify solutions to improve various challenges in the food system.

### **Defining “Local” and “Local Food Systems”**

When discussing healthy food systems, “local” and “local food systems” are terms that are often used. There is no one specific, all-encompassing definition but, generally speaking, it

refers to the distance your food travels from its geographic location to the consumer (Martinez et al., 2010). The 2008 Farm Act defines locally or regionally produced foods as having travelled “*less than 400 miles from its origin, or within the State in which it is produced*” (Martine, et al., 2010). In Alaska, the Fish-to-Schools program, Farm-to-Schools program, and Farmer’s Markets make available examples of what we would consider local foods. The State of Alaska Department of Agriculture (2013) has created the *Alaska Grown* program “*to increase consumer awareness and consumption of Alaska agricultural products*” (State of Alaska, 2013). Benefits of local food production and consumption can be increased economic development, improved health and nutrition, less food miles travelled, less energy used, and less greenhouse gas emissions (Martinez et al., 2010).

### **Identifying the Community Partner: Alaska Food Policy Council (AFPC)**

The Alaska Food Policy Council is an organization focused on improving the food systems of Alaska. Their vision is to create “*a healthy, secure food system that feeds Alaskans*” and their mission is that “*The Alaska Food Policy Council (AFPC) improves our food systems for the benefit of all Alaskans*” (AFPC, 2014). The group is open to those interested in becoming involved in strengthening the food system and is comprised of local, state, and federal entities, as well as schools, tribal groups, fisheries, and farms (AFPC, 2014). Some of the AFPC’s accomplishments and activities have included emergency food preparedness training, supporting school engagement in Fish-to-Schools and Farm-to-Schools programs, partnering with other agencies to conduct a food assessment of Alaska, as well as commissioning a report of good food-related indicators in Alaska, which can help the AFPC measure their impact on improving the food system in Alaska (AFPC, 2014). The AFPC has also engaged legislators in food policy as advocates for continued support for programs such as Farm-to-Schools, and has also included

the public in food systems issues via town hall meetings and conferences (AFPC, 2014). The vision, mission, and goals of the AFPC make the organization a logical partner for this practicum project.

### **Educational Theory**

There is consistent research on best practices and the effectiveness of online learning. Online learning allows for more flexibility in how educational information is accessed; it gives students more control over how their education is paced; and it can be more accessible to those who have other life commitments that may not allow them to engage in real-time “traditional” education (Ally, 2004). Asynchronous courses may allow for more flexibility in schedules for both student and instructor, and synchronous courses give students who benefit from more real-time interactions and learning opportunity to engage with classmates and the instructor (Ally, 2004). Additional benefits of online learning may include access to a more diverse group of “experts” and professionals who would not otherwise be able to participate in a course because of time or geographic location. For example, an expert in Maternal and Child health may live in Fairbanks, Alaska and be able to participate in leading a course that can be accessed by students all over the state, other states, and from other countries depending on how the online course is set-up.

When designing online educational courses, the overarching goal is to promote learning (Ally, 2004). Learning styles are very individualized and there are various schools of thought on how students learn. There are three schools of learning, or learning theories, that are thought to be most effective in developing courses: Behaviorist theory, cognitivist theory and constructivist theory (Ally, 2004; Anderson, 2008).

- ***Behaviorist theory.*** Learner prefers fact-based knowledge, as well as the “what” of the information being taught.

*Delivery method.* Outlining specific learning outcomes, utilizing tests, quizzes, or another form of assessment to determine if student has achieved learning outcomes.

- ***Cognitivist theory.*** Learner strategizes the “how” of information being delivered. It is more of an internal process with a “point-of-view”. The learning makes use of memory, motivation, thinking, reflection, real-life context, and the principles of the information.

*Delivery method.* Stimulate the learners’ senses with audio, visuals, and videos to deliver information. Chunk information into 5 to 9 units or lessons to avoid overstimulation. Peer group work, self-reflection, and practical projects should be used to motivate learning.

- ***Constructivist theory.*** Learners are active rather than passive and prefer to construct knowledge rather than be given it through instruction. Learners contextualize information according to their personal reality, and observe, process, and interpret information to be applicable to real-life.

*Delivery method.* Keep learner engaged by having them apply knowledge and information to a practical situation. Having the learner engage in a learning journal will allow student to construct what they have learned through reflection and processing.

### **Chapter 3: Goal, Aims, and Objectives**

The project *Teaching Food Systems in Alaska* offers an opportunity to provide expert information and education to Alaska youth on the importance of food system literacy and stimulate a desire to become an engaged member in the food system. This was done through educational modules that cover different components of Alaska's food system and included presentations, readings, and activities that offer a comprehensive review of food systems topics. The community partner, the Alaska Food Policy Council, will house the modules, but it is anticipated that other agencies will utilize the modules, such as the Calypso Farm and Ecology Center, the Alaska Farm-to-School program, and/or the University of Alaska Fairbanks Cooperative Extension. Further, it is also anticipated that the modules will form the foundation for future work involving a comprehensive food systems immersion program by AFPC and collaborating institutions.

#### **Goal with Associated Aims and Objectives**

To inform and educate Alaska youth about food systems in Alaska.

- *Aim 1.* To develop a series of educational learning modules organized to address the three primary components of the food system: food availability, food access and food utilization.
- *Objective 1a.* Identify and recruit experts/professionals in the field to contribute to key areas of the learning modules relating to food availability, food access, and food utilization.
- *Objective 1b.* Collaborate with recruited experts/professionals on what content will be included in each unit, presentation, readings, and/or activities.  
Establish a template for PowerPoint content.

- *Objective 1c.* Establish a timeline for completion of units with the project contributors.
- *Objective 1d.* Complete a guidebook that will accompany the modules.
- *Objective 1e.* Pilot a subset of modules with youth and make changes according to feedback.
- *Aim 2.* Disseminate the modules and guidebook.
  - *Objective 2a.* Make the modules and guidebook available to the public via social media, the AFPC listserv, and email.
  - *Objective 2b.* Target programs and organizations (e.g. Calypso Farm, Cooperative Extension, local foods networks, etc.) that will potentially utilize the modules and guidebook when distributing information on the modules' availability.

## Chapter 4: Methodology

### Food Systems Youth Education Modules

The development of the *Teaching Food Systems in Alaska* learning modules was not intended to address or change any specific health behavior. Rather, the purpose is to provide information, knowledge, and education to inspire Alaska youth to become interested and engaged in the food system in which they live. This newly acquired knowledge and information will ideally inspire them to become involved in improving the food system personally, academically, and/or professionally. In many ways, food systems literacy is an area that is new in the arena of public health but is gaining momentum across the United States, as seen through Farm-to-Schools and Fish-to-Schools programs and online curricula, such as the John Hopkins School of Public Health's (2014) *Teaching the Food System* curriculum.

The development of the modules was intended to provide a foundation for the development of future, additional modules that would be part of a larger, comprehensive food systems program, possibly offered in collaboration with the Alaska Food Policy Council. The module topics were chosen based on the three categories of food security, but are also informed by the recommendations made in the Meter & Goldenberg report, *Building Food Systems in Alaska* (2014), commissioned by the Alaska Department of Health and Social Services and the AFPC.

The key recommendations from the report were intended to guide the State of Alaska in future actions (Meter & Goldenberg, 2014):

- Foster subsistence harvesting and related skills.
- Build personal capacities in agriculture.
- Expand agriculture 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.

Based on the report, the *Teaching Food Systems in Alaska* educational learning modules were proposed to inform and educate youth about food systems in Alaska. The food systems modules are broken down into three primary areas of focus and they are:

**Module 1: Food availability.**

- *Distribution.* Overview of food distribution in Alaska and “how we get our food”. Identifies strengths and challenges to Alaska’s food distribution system and solutions to issues.

**Module 2: Access to food.**

- *Food Security.* Defines what food security and insecurity are. Explores food and nutrition assistance programs and critically thinks about food security in Alaska’s communities. Identifies the implications for population health.
- *Emergency Preparedness.* Defines what emergency preparedness is and why it is important in Alaska.

### **Module 3: Food utilization.**

- *Environment.* Assesses the food environment in Alaska. Includes examination of social and cultural values of food and the impact those have on food security and health, including subsistence lifestyle (hunting, fishing, gathering).
- *Diet and Health.* Examines the relationship between food choice, nutrition, health and health disparities in Alaska.

Taking into consideration educational theory for online learning and that individual learning styles and processes vary, a combination of behaviorist, cognitivist, and constructivist theories were used in the designing of the modules, as this approach has been historically successful for online learning (Ally, 2004; Anderson, 2008). A combination of activities based upon the three educational theories promote an opportunity for students to be successful depending on their learning styles and learning strengths, and each module was designed to incorporate each as such:

#### **Teaching Food Systems in Alaska Module Design**

- Clearly outlined learning objectives and educational goal.
- Importance of learning information and how it will benefit the learner.
- Fact-based student self-assessment of knowledge.
- Information chunked in 5 modules or “units”.
- Textual materials, visual materials, audio materials, links to online information included.
- Personal journaling and self-reflection activities.
- Real-life contextualization of information.
- Interaction with other learners and/or instructor.

Each module facilitates both food systems literacy and career exploration, and incorporates culturally relevant information and practices surrounding food availability, food access and food utilization. Each module is designed to be stand-alone, but collectively offers an introduction to food systems in Alaska. As outlined, each module has learning objectives, an educational goal, key terms, background readings, links to websites, a recorded Vimeo presentation by a subject matter expert, activities, and a final learning assessment. Students will be able to demonstrate an understanding of important concepts, foster critical thinking, and will be encouraged in self-reflection.

### **Target Audience**

The modules were designed to appeal to upperclassmen high school and pre-college students who are interested in Alaska food systems. Module content addresses where food comes from, how it is produced, and how it is used, while incorporating relevant health, social, and cultural information (e.g., diet and health, subsistence lifestyle). From PowerPoint-guided lectures, readings, and assessments students will be provided information on how to access healthy, local food, where to initiate change in the Alaska food system, and potentially become experts in an aspect of the food system.

Students should acquire an enhanced awareness of the food system and be able to critically examine the connections across food distribution, food security, social and cultural ties to food, and analyze the challenges that the food system has, as well as see ways that they can positively contribute. It is important to note that these modules provide an *introduction* to food systems. They do not cover practical skills such as how to grow and harvest food stuffs, food safety, and other important parts of food systems in Alaska. Ideally, further modules will be created that will expand on these modules and incorporate real-life skills that students will be

able to use. However, this should not diminish the importance of learning how food systems work and what the various components of a food system are.

### **Online Modules**

The modules will be become available online so that they can be accessed at any time. Each module was designed to “stand alone”, but can also be engaging collectively to provide a comprehensive overview of Alaska’s food systems. Upon completion, the AFPC Board of Directors will review the modules and supporting materials, and determine if/where/how to disseminate the information on the organization’s website.

### **Guidebook: An Overview**

A guidebook was created to help module facilitators, and perhaps students, who will use the modules to navigate the material. The guidebook offers a description to provide overall context for why the modules were created, and provides an outline for how the modules are categorized. There is a description of how the modules are designed (learning objectives, educational goal, background readings and links to information/activity websites, presentation, discussions/activities, and student assessments); a list of who might use the modules (i.e., after school programs, nutrition and education programs, 4-H groups, school and community gardening programs, or other programs and individuals who have an interest in food systems literacy); and a list of resources for the facilitator to utilize in order to become more familiar with food systems information. This guide serves as an introduction on how to use the modules.

### **Module Topic Rationale**

Each module topic was chosen based on key concepts of the food system as outlined by Ingram (2009) and includes:

- *Food Availability*. Production, distribution, and exchange.

- *Access to Food.* Affordability, allocation, preference and/or cultural appropriateness.
- *Food Utilization.* Nutritional value, social value, and safety.

Additionally, as outlined earlier in this section, the Meter & Goldenberg report (2014) offered several recommendations that should be a priority for Alaska decision-makers to fill gaps in formal training, education, and overall food systems engagement, specifically for youth:

*“A culture of food production should be nurtured that brings Alaskans together to learn about growing, gathering, preserving, preparing, and savoring good food, to celebrate seasonal foods and natural cycles, and to form social bonds across generations that celebrate place. It is this awareness of, and connection to, food production, combined with a strong sense of community connection, that will do the most to promote economic growth and self-reliance, prevent obesity, reduce food-related health impacts, and achieve food security.”(p. 5)*

In consideration of the recommendations made by Meter & Goldenberg (2014), the module topics were chosen to reflect the call to educate Alaska’s young people on the basics of what food systems are, how they function, why they matter, and how they impact us. The project is a step towards achieving the recommendations.

Ideally, future modules will be created to meet all of the recommendations made. The current modules provide a foundation of food systems literacy that can be built upon to incorporate other food systems topics, as well as practical skills training and hands-on learning. Future module topics that integrate the Meter & Goldenberg (2014) recommendations could include subsistence knowledge and skills/wild and edible foods identification; gardening,

composting, safe food handling, and food preparation; food recycling and waste; environmental impact of food production and distribution; and, food policy and advocacy.

**Module 1: Food availability-distribution.** This module provides an overview of food transportation and distribution, and “how we get our food” in Alaska. The strengths and challenges Alaska faces in the food supply chain are identified and solutions to challenges are outlined. The educational goal of this module is “*for the student to gain an introductory understanding of food distribution in Alaska*”. The module outlines the importance of a healthy food system, identifies what makes a healthy food system, and the significance of improving the food distribution system. This also includes the importance of consuming local and regional foods from farms and other food sources. This is done through the video presentation, required readings, and in the activities/discussion. The learning objectives are that at the end of the module state that students should be able to:

- List components of a healthy food system.
- Describe how Alaska’s food is distributed and explain why food distribution operates the way it does.
- Identify strengths and weaknesses in Alaska’s food distribution system.
- Explain local, regional, and global foods. List benefits and limitations of consuming each.
- List ways that Alaskans contribute to supporting a healthy food system.

**Module 2a: Food access-food security/insecurity.** This module provides a summary of food security, insecurity, and hunger in Alaska. It provides an overview of what contributes to food insecurity, what the implications are on health; and, how support systems, such as nutrition and food assistance programs, can alleviate food insecurity. The educational goal for this module

is for students “*to gain an understanding of what factors contribute to food security and insecurity in Alaska, and to critically analyze the implications for a healthy food system*”. This module plan includes a video presentation, background readings, student assessment, and activities/discussions.

The learning objectives for this module are that by the end of the module students will be able to:

- List what makes a person and/or household food secure.
- Explain the different levels of food security/insecurity and differentiate between food insecurity and hunger.
- Describe threats to Alaska’s food security.
- List contributing factors to food insecurity and hunger.
- Identify and describe “safety nets” and how they support those who may suffer from food insecurity and/or hunger.
- Describe actions that can be taken to address hunger and/or food insecurity.

**Module 2b: Food access-emergency preparedness.** Emergency preparedness is a significant part of maintaining a healthy food system. Alaska is vulnerable to disasters that could have prolonged disruptions in access to food. Education on how to be prepared for a disaster, the importance of food caches, and other emergency preparedness infrastructure can help communities be more prepared. The educational goal for this module is for students “*to gain an understanding of what factors contribute to food emergencies in rural and urban Alaska, and how to prepare for and respond to such emergencies*”. This module plan includes a video presentation, required readings, student assessment, and activities/discussion.

The learning objectives include:

- Identify potential causes of food disruption and explain impacts.
- Detail the important components of a food cache and how to build one.
- Describe existing, and gaps in, emergency food infrastructure in Alaska.
- Describe how emergency food supplies, including those for the routinely food insecure, are distributed in Alaska.
- Identify existing programs or interventions that address food emergency scenarios in Alaska.

**Module 3a: Food utilization-environment.** This module assesses the food environment in Alaska and examines the social and cultural values of food, including traditional foods and subsistence lifestyles—hunting, fishing and gathering. It also offers an overview of how food impacts individual health and community health, specifically nutrition-related chronic disease and wellness. The educational goal of this module is for the student *“to gain an understanding of the relationship between culture, values, tradition, health, and the (food) environment in Alaska.”* This module plan includes a video presentation, background readings, student assessment, and activities/discussions. The learning objectives are that at the end of this module students will be able to:

- Reflect on their food environment, the role food plays in their lives and what food means to them.
- Describe the significance of the connection between food, health (and, chronic disease) and the food environment.
- Identify and explain barriers, transitions or other trends that have had an impact on Alaska’s food environment, specifically in subsistence living and/or the consumption of traditional foods.

- Explain how the transitions in Alaska’s food environment have impacted community health.
- Describe the significance of food culture and traditions on food security.
- Identify and describe benefits that may result from consuming local foods, including subsistence foods and traditional foods.

**Module 3b: Food utilization-diet and health.** Food choices significantly affect public health. The typical American diet is high in refined grains, added fats and added sugars and low in nutrient-dense foods, such as whole grains, fruits and vegetables. This type of diet contributes to obesity and chronic diseases, such as diabetes, heart disease, and high blood pressure. This module examines chronic disease, obesity and diet in Alaska, what influences food choices, and what efforts are happening to help improve Alaskan diets and reduce chronic diseases. The educational goal of this module is for the student to” *gain an understanding of what factors influence food choice, how those choices can impact health, and what interventions can help improve the diet and health in Alaska.*” This module plan includes a video presentation, background readings, student assessment, and activities/discussions.

The learning objectives are that at the end of this module students will be able to:

- Describe how diet affects health.
- Describe what influences food choice and what contributes to poor food choices.
- Explain what chronic diseases are and how individuals become at risk for developing chronic disease.
- Identify existing programs or interventions that address diet and health in Alaska.
- Discuss ways that Alaskans can improve their health and/or prevent chronic disease.

## **Recruitment of Experts**

The PowerPoint for each module was designed to draw upon the expertise of those professionals already working in specific areas of Alaska food systems. Experts (Table 1) were identified through pre-existing professional relationships, online research and through recommendations from other professionals, specifically the practicum project committee and site supervisor. An email was drafted to each individual requesting their involvement in the module development, i.e., co-developing and recording a PowerPoint presentation on a specific topic. Several teleconferences were planned with each contributor to review the module topic, content, and desired outcome of his/her presentation. In order to not have the contributors duplicate their professional efforts, it was encouraged that they utilize and/or combine presentations that they had created and delivered in the past. The contributor was asked to either create a presentation using the PowerPoint template that was created for all the module presentations or to remove their own presentation template. The desired final product was that each module, relating documents, and recorded presentation have a consistent aesthetic.

## **Institutional Review Board and Protection of Human Subjects**

This practicum project was exempt from Institutional Review Board review. The project dealt with information that was available to the public and there was no need to protect human subjects in the project. The survey used in the evaluation of the educational materials did not collect any personal identifiers (names, ages, community, etc.) and completion of the evaluation was voluntary.

## **Youth Alliance for a Healthier Alaska (YAHA)**

In order to evaluate whether the modules were appealing, useful, informative, inspirational, and entertaining to the target demographic (i.e., upperclassmen high school and

pre-college students), we contacted the Youth Alliance for a Healthier Alaska (YAHA), to request that their group view and evaluate one of the module presentations. The YAHA is a group of students from around the state that advise and offer feedback to youth-serving programs (State of Alaska, 2016). The group is comprised of 14 to 18 year olds who want to improve the lives for adolescents living in Alaska. Jennifer Baker, Adolescent Health Project Coordinator for the State of Alaska Division of Public Health and the YAHA Adolescent Health Coordinator, was emailed requesting that the group participate in providing feedback on one of the module presentations. The YAHA has an application process for each program or agency that would like their intervention, materials, programs, and/or projects reviewed by the group. Once the application was turned in to the YAHA Coordinator it was suggested that the project be introduced to the students via tele-conference. In the teleconference the purpose of the practicum project was reviewed and time was allowed for students to ask questions or raise any issues they had about participating. The group meets on a monthly basis and the review of the module PowerPoint was put on the agenda.

The presentation that the students were asked to view was on *Food Utilization-Environment*. The students were given a time frame in which to view the presentation and then they were provided with a link to an online survey which asked for feedback on the overall quality of the presentation. The survey asked 5 closed-ended and 5 open-ended questions about the quality of the presentation with respect to appeal and content (Appendix). The survey was designed to collect both quantitative and qualitative responses. The survey was intended to solicit feedback on the quality of the modules and offer guidance on what could be improved or changed. The students were asked to view the presentation and fill out the survey. The survey

was then closed and the responses were analyzed. Based on the feedback from YAHA, changes were incorporated where possible in improving the quality of the presentations and/or content.

Table 1		
<i>Module Contributors</i>		
Food System Components	Food System Sub-Components	Contributors
Food Availability	Distribution	<p><b>PowerPoint-</b> Jessika Beam, UAA MPH Student.  <b>Recorded Lecture-</b> Daniel Consenstein, State Executive Director for the U.S. Department of Agriculture, Alaska Farm Service Agency. Mr. Consenstein also serves on the Alaska Food Policy Council’s Governing Board as the Treasurer.  <b>Rationale-</b> Food distribution proved to be a challenging topic to recruit experts on. After several failed attempts at recruitment it was decided to move forward with completing the PowerPoint and recruiting Mr. Consenstein to review the PowerPoint content and record the lecture. His work with the AFPC and with farming in Alaska aligned well with the module content. Mr. Consenstein has also delivered many talks on Food Systems topics.</p>
	Food Security	<p><b>PowerPoint-</b>Tracey Burke, PhD, UAA School of Social Work and Cara Durr, Alaska Food Bank, AFPC Governing Board member.  <b>Recorded Lecture-</b>Tracey Burke, PhD.  <b>Rationale-</b> Both Dr. Burke and Ms. Durr have extensive experience in food security and insecurity issues in Alaska. Both have extensive experience delivering talks on Food Security issues in Alaska.</p>
Access to Food	Emergency Preparedness	<p><b>PowerPoint-</b> Darren Snyder, Agent, UAF Cooperative Extension Service and AFPC Governing Board Member. Jessika Beam, UAA MPH Student.  <b>Recorded Lecture-</b> time limitations prevented the recorded lecture from being completed.  <b>Rationale-</b> Mr. Snyder has a strong background in emergency preparedness in Alaska and has given presentations on this topic.</p>
	Environment	<p><b>PowerPoint-</b> Gary Ferguson, ND, Director of Community Wellness, Alaska Native Tribal Health Consortium.  <b>Recorded Lecture-</b> Gary Ferguson, ND.  <b>Rationale-</b>Dr. Ferguson has a strong background in health, wellness, diet, and traditional foods/subsistence activities in Alaska. He also has given many lectures on the subject matter.</p>
Food Utilization	Diet and Health	<p><b>PowerPoint-</b>Diane Peck, MPH RD, Alaska Department of Health and Social Services, Division of Public Health. AFPC Governing Board member.  <b>Recorded Lecture-</b> Elizabeth Hodges Snyder, PhD, UAA Department of Health Sciences. AFPC Governing Board Co-Chair.  <b>Rationale-</b> Ms. Peck has done a lot of work relating to diet and health in Alaska and Dr. Snyder has a strong background in food systems issues as well as presenting and providing recorded lectures.</p>

## Chapter 5: Results and Discussion

### Module Results

The delivery method of presentations from contributors ended up being quite varied. In one instance, a contributor sent two presentations he had created and they were combined into one presentation in the PowerPoint template. In another instance, a presentation was created by the practicum project student and sent to a contributor to record. In yet another instance, a PowerPoint was created by one expert contributor and sent to another expert to record the presentation. A timeline was set with each as to when the presentation would ideally be completed and this was not necessarily a timeline that was kept. All of the modules were completed with the exception of the *Emergency Preparedness* module. Due to time limitations this module is incomplete to-date.

**Food distribution module.** This module offers an introductory overview of Alaska's food distribution system. This information can fill a gap in student knowledge about how food distribution operates and what needs are met and what limitations exist in the food distribution system. The recorded presentation, readings, and activities encourage students to examine their personal relationship in the food distribution system. Challenges that exist with information in this module are that food distribution is a component of Alaska's food system that lacks concrete data. There is knowledge and information on how food is physically moved and made available to consumers, in what form it is moved, when food is received and who delivers/distributes it. It is understood why food is imported to Alaska and what necessitates importation. However, it is unclear exactly how much food is imported, and even though 95% percent seems to be the commonly accepted, and used, number there is no evidence to actually support that (ISER, 2012). There is also a lack of data on how much food Alaska produces, how much of it is locally

consumed, the cost of shipping to, and within, the state; and, the environmental impact that this has (ISER, 2012).

**Food security module.** Information provided in this module gives students access to information on what it means to be food secure and insecure in Alaska. It provides an overview of some of the contributing factors to food insecurity and what implications these can have on health and well-being. It also provides ways that those who are experiencing food insecurity are being supported and efforts being made to alleviate food insecurity. Through the recorded video presentation, readings, student assessment and activities students have an opportunity to connect with organizations in their community that work in improving food security.

**Emergency preparedness module.** This module is currently incomplete due to time and contributing expert limitations. The AFPC will complete this module in future efforts.

**Environment module.** The subjects covered in this module may raise issues that students have not been exposed to before. Traditional foods and/or subsistence foods in Alaska might offer new information to many students. Traditional foods in this module are referred to in the context of Alaska Native culture but the module also includes discussions about culture and social value placed on all (traditional) foods. This module also may offer students an introduction into subsistence living, which is not accessible to, or practiced by, all living in the state. The recorded presentation, readings, student assessment, activities, and videos provide students with a framework in which they can think about their food environment and gain insight into other food environments in Alaska.

**Diet and health module.** The content in the module reviews how food choices affect human health. The information provided specifically addresses how chronic disease, food, and nutrition are related. Students may gain a more comprehensive understanding about how food

choice impacts their current and future health, but also be able to learn that food choice is not always within an individual's control due to circumstance. The recorded video, readings, student assessment, and activities offer students an opportunity to research issues related to diet and health in Alaska, as well as examine their own food choices.

### **Youth Alliance for a Healthier Alaska (YAHA) Results**

The delivery of the PowerPoint to YAHA was a complex process. Initially, the PowerPoint PDF was uploaded onto Google Drive and then to DropBox but these were not easily accessible by the YAHA Coordinator, and it was decided to try another delivery mechanism. The presentation was then uploaded using Adobe Captivate and this is how the presentation was delivered to the YAHA members to watch and then offer their feedback.

There were only 3 responses and the YAHA group was given another week to complete the task but, unfortunately, the 3 responses were the only ones collected (Tables 2 and 3). The quality of the feedback was very thoughtful and constructive, and in some instances changes could not be made to the existing modules but will be taken into consideration in the future. For example, ensuring that the modules are in-line with the American with Disabilities Act guidelines was a suggestion that should be considered for future versions. It was also very useful to know that students had a lot of difficulty with the delivery of the presentation which significantly altered their viewing of it. The delivery system was not working for most of the students. There were issues with bandwidth, which affected the quality and pace of the presentation.

Table 2	
<i>Closed-Ended Survey Categories of Inquiry and Results</i>	
Evaluation Statement	Percent Agreement by Respondents
The presentation was well-organized and appealing	100% Agreed
The presentation developed your interest in the subject matter.	100% Agreed
The presentation offered you new information.	66% Agreed 33% Strongly Agreed
The purpose of the presentation was clear to you.	66% Agreed 33% Undecided
The subject matter/information in the presentation was challenging enough for you.	33% Agreed 66% Undecided

Table 3	
<i>Open-Ended Questions and a Sample of Responses</i>	
Evaluation Question	Responses
What did you like most about the presentation?	<i>“I really enjoyed the various references and studies you used to convey your points.”</i>
What are your suggestions for improving the presentation?	<i>“Audio was spotty at first; bandwidth may be a challenge that limits access for some. There should be a discussion about food safety within (washing hands, not bathrooming while harvesting, proper identification techniques to avoid poisonous plants and proper cleaning and rinsing of freshly harvested plants, berries and vegetables.”</i>
What did you learn from the presentation?	<i>“I learned how impactful western diets have become on not only Alaskan Natives, but on everyone in general. Because of these diets, some Alaskan natives are seeing swift changes to their dental health from eating more processed diets rather than more traditional ones. Therefore, because of the evident drawbacks of our new western diets, people should look towards more traditional foods in order to maximize health benefits and celebrate traditional culture.”</i>
What other food related topics would you like to learn about in future presentations?	<i>“I’m interested in exploring the topics of genetic “Arctic variant” (genetic patterns are cool!) and how food eaten early by kids can influence what they like in later life. Thinking that kids need “special” food is a huge flaw in western society, and feeding them the same food an adult would eat would help encourage a healthier diet in the future. “</i>
Do you have any questions or other comments after viewing the presentation?	<i>“Some of the slides cut off some text at the edges. Increase font size, include closed captioning and insure the content is compliant with ADA expectations.”</i>

## Discussion

Future module development will take into consideration the recommendations from the YAHA members. Even though the response rate was lower than anticipated, those students that did respond offered useful feedback that was used to strengthen the current modules and will be applied to future module development. The content appears to be relevant, interesting, and at a seemingly appropriate level for the viewers. It also seems that there is a desire to see other food-related presentations, which is a positive indicator for the other modules' appeal and for future development of module topics. Based on the feedback provided by YAHA, the delivery of the PowerPoint was an issue and not accessible in high quality to all. Using Adobe Captivate was not a sustainable delivery system due to inaccessibility and the cost of utilizing it in the long-term. This feedback prompted research into other delivery modes of the PowerPoints. The online streaming service Vimeo is a more universally accessible delivery system and more appealing and user-friendly to younger viewers. The recorded PowerPoint presentations were subsequently uploaded using Vimeo, seem to be easily accessible, and this is the format all the module presentations will have in the future.

The *Teaching Food Systems in Alaska* modules provide a foundation for a more robust and comprehensive foods literacy program. Each module addresses a food system component related to food availability, access to food, and food utilization. Students exposed to the modules will be introduced to concepts relating to Alaska's food system and ideally stimulate a curiosity to pursue further food-related education. Based on Meter & Goldenberg's (2014) recommendations, future modules should be designed building on the concepts presented in these educational modules and expanding to more practical skills, such as gardening or food policy advocacy. Incorporating the expertise of those already working in the State to enhance the

stability and health of the food system seems to be an effective way to design the modules. Each contributor offers knowledge gained from their work and education in the food system and can effectively pass on that knowledge to those who may be interested in learning more.

## Chapter 6: Public Health Implications

The *Teaching Food Systems in Alaska* modules address various components of the food system. What makes a food system healthy, how food choice contributes to chronic disease, and what food insecurity means in Alaska are some of the topics reviewed. The modules all address how various components of the food system affect health. This food systems approach to public health is a complex one. In *Food Systems and Public Health Disparities* (2009) the authors write:

*“A food systems approach begins with the recognition that the roots of health disparities include but go deeper than individual choice, nutrition, or price. They reach outwards to community factors like access and deeper to broad social, economic, and political forces that impact food supply, nutrient quality, and affordability. Further, some of the health disparities are driven by the environmental and social impacts of food production and processing. The roots and pathways are not linear but rather reflect complex processes and feedback loops such as that of consumer demand.”* (p. 283).

The modules offer users the ability to have access to information that illustrate more complex ideas that healthy food systems are about more than having enough to eat, eating healthfully, or not having disrupted grocery delivery—it is all those things—but the food system has many stakeholders, players, and activities with many different roles and interactions (Ingram, 2009). As previously discussed, education can offer knowledge that empowers individuals and those empowered individuals can become engaged members in enhancing Alaska’s food system. This may lead to a more stable food system that can have positive outcomes on public health. Studying the food system can cover issues of social justice, workers’ rights, food safety and

food-borne illness, soil and water quality, and the impact of food production on the environment—all these topics have public health implications.

### **The 10 Essential Public Health Services**

The 10 Essential Public Health Services describe the various activities of public health practitioners (CDC, 2014). Of the 10 Essential Public Health Services, the *Teaching Food Systems in Alaska* modules primarily address three:

- ***Inform, educate, and empower people about health issues.*** The food systems modules will inform and educate Alaskan youth about how food is made available, how food is accessed and how it is utilized. The information provided and knowledge gained will engage and empower youth to become involved in the food system on the personal, academic, and/or professional levels.
- ***Mobilize community partnerships and action to identify and solve health problems.*** Modules incorporate experts in the food system community in Alaska who provide knowledge about how to improve the food system, and ultimately public health.
- ***Develop policies and plans that support individual and community health efforts.*** The modules support individuals in Alaska to become more informed citizens and to ideally become a part of those that act and plan to improve the health initiatives and efforts in the state.

## Chapter 7: Strengths and Limitations

Those working in the field and involved in Alaska's food systems are making positive changes in the health of that system. The expert contributors to the *Teaching the Food Systems in Alaska* modules were able to use their professional experience and knowledge to offer high quality content and product.

Nevertheless, there were challenges in the creation of the modules. Identifying key individuals to collaborate on the presentation development was difficult due to other professional, personal, and academic commitments—it was a lot to request from those who already are working on a variety of different projects. It was also difficult to maintain the contacts made overtime. Those that were highly motivated to participate in the project could not do so over the long period of time it takes in the development of a practicum project; and, this was particularly challenging due to geographic distances preventing in-person meetings and face-to-face conversation. Additionally, besides personal passion, there lacked incentive for individuals to participate and donate their time. A stipend or honorarium would have been a small reward for the time commitment individuals made to contribute to the module presentations. The time period that it took to get the PowerPoints and their recordings, to find a suitable launching mechanism for them, and to finish the modules prohibited the pilot testing of multiple complete modules. Having the YAHA students view and survey one of the presentations was very helpful, but ideally there would have been a larger number of students offering feedback.

The *Teaching Food Systems in Alaska* modules seem to fill a gap in Alaska with regard to food systems literacy. Currently, a central resource for food systems educational information does not exist and a future program based on the *Teaching Food Systems in Alaska* modules

could offer a central location for educators, students, and other program coordinators to access information and lessons on the food system. There is not a shortage of education programs or efforts that are working to enhance Alaska's food security, but a more formal foods systems educational program seems to be a need. One example of a comprehensive curriculum is the John Hopkins Teaching Food Systems Curriculum (John Hopkins University, 2010). This curriculum served as an example of a food systems curriculum for the *Teaching Food Systems in Alaska* modules and it provides information on components of the food system in the United States but also on a more global level. This curriculum was developed over time and has been refined and evaluated with contributions by educators and public health professionals. The *Teaching Food Systems in Alaska* modules relied on expert contributors for the development of the PowerPoint and accompanied lectures, but a limitation in the actual modules is that it would be ideal to have content contributed by educators and public health professionals, or at the very least have the modules peer reviewed. In Meter & Goldenberg's report (2014) it is written that the most successful efforts in improving food security have small scale efforts, and that small steps have an important impact. The recommendations made in the report which guided the development of the *Teaching Food Systems in Alaska* module topics have far reaching goals, recommended actions and measures of success, but if small steps can have important impacts then the development of these modules may be a step towards a successful foods literacy program. It is not yet one that will meet the recommendations made in the report, but the modules do offer a foundation on which to build. Limitations to designing and implementing food systems educational programs and trainings may be that there is a need for more research, funding, and action to promote comprehensive programs.

## Chapter 8: Conclusions and Recommendations

The *Teaching Food Systems in Alaska* community partner, the Alaska Food Policy Council, has a Strategic Plan (2012) that outlines goals and objectives for the organization, which include:

- ***Goal 1. All Alaskans have access to affordable, healthy (preferably local) foods.***
  - *Objective 1a.* Increase access, availability and affordability of local foods to end consumers.
  - *Objective 1b.* Increase the number of organizations with traditional, customary, historic food-gathering leave policies.
  - *Objective 1c.* Increase the number of Alaska schools participating in local, healthy, and traditional food procurement.
  - *Objective 1.* Increase the number of Alaska institutions (e.g., hospitals, government agencies) participating in local, healthy, and traditional food procurement.
- ***Goal 2. Alaska's food-related industries have a strong workforce and operate in a supportive business environment.***
  - *Objective 2a.* Increase the number of Alaskans that take part in food-related educational and degree programs.
  - *Objective 2b.* Increase support for food-related business development in Alaska.
- ***Goal 3. Food is safe, protected and supplies are secure throughout Alaska.***
  - *Objective 3a.* Increase the number of Alaskans that participate in food safety and protection training and education programs.

- *Objective 3b: Improve the emergency food preparedness of communities and regions.*
- ***Goal 4. Alaska’s food system is more sustainable.***
  - *Objective 4a. Expand and protect food production capacity.*
  - *Objective 4b. Improve the distribution system for getting Alaska food products from producer to end user (consumers, retailers, food service businesses, schools, etc.).*
  - *Objective 4c. Expand access to home and business food processing and storage.*
  - *Objective 4d. Increase Alaska food marketing.*
  - *Objective 4e. Reduce waste from food, food packaging and agriculture.*
- ***Goal 5: Alaskans are engaged in our food system.***
  - *Objective 5a. Improve the body of research that will inform and support Alaska food policy efforts.*
  - *Objective 5b. Increase the number of food advocates among the public that support local food system initiatives and policy changes that are aligned with AFPC core values.*
  - *Objective 5c. Increase the opportunities for advocates of healthy food initiatives and educators about healthy food to be heard by policy makers and the public.*

The modules created offer opportunities for future Alaskans to engage in food systems activities that can help the AFPC reach these goals. Students will be educated on the importance of having access to affordable, healthy, local foods. An educated citizenry may become active

members in Alaska’s food-related workforce; and, improving food systems literacy may encourage Alaskans to become more engaged in the food system to help improve its health and sustainability.

There are many current efforts by individuals through many programs and activities on the local and statewide level in Alaska that are trying to improve the health of Alaska’s food systems. There is also an awareness that though there may be significant current efforts, there is a need for more research, funding, and action in food policy making, including the funding of educational programs that promote learning and skills training on food systems topics. In an effort to harness the current efforts being made, it seems that even more interagency collaboration would make current activities and efforts more efficient. There could be more collaboration on research into food systems literacy needs and research gaps.

Additionally, taking into consideration the implications of how Alaskans define food security, and incorporating the recommendations from the Meter & Goldenberg report, may be an approach in developing an “*Alaska-centric*” food systems literacy course. There are environmental transitions that are having an impact on food security in Alaska and exploring those trends and incorporating those into an educational program would address issues and challenges that exist in Alaska’s food system(s). Specifically, taking into consideration other definitions of what makes a healthy food system, such as outlined in the Inuit Circumpolar Council’s report on Inuit food security. Future module topics could include:

- *Subsistence harvesting and related skills.* Wild foods identification, foraging/harvesting, processing, food safety and food preparation; and, incorporating Indigenous Knowledge and the cultural and spiritual practices surrounding subsistence lifestyles.

- *Personal (community) food production.* Teaching how food grows, is harvested and preserved, and the natural, seasonal cycles. Students could learn gardening and composting skills, including safe food handling practices, preparation, and storage.
- *Food safety and food-borne illnesses.* A specific module on safe food handling practices could be a useful and complementary educational topic to the more hands-on food modules. Food safety could incorporate an overview of traditional food processing activities from around the state and discussion of the associated risk of food-borne illnesses might be appropriate.
- *Food policy and action.* Providing students with an overview of food policy in Alaska and opportunities to take action to implement change or to advocate for a particular food issue may be helpful in having students engage in food systems advocacy in the future. This could apply to a variety of areas such as subsistence laws and regulations.

The *Teaching Food Systems in Alaska* modules are a starting point and a foundation for the development of future modules and a more comprehensive “program”. The modules will need to be housed by an agency such as the Alaska Food Policy Council, reviewed, revised, and disseminated. Ideally, the modules will be disseminated in a professional setting in order to peak an interest in the modules. *Teaching Food Systems in Alaska* could be featured as a poster presentation at a food focused conference or could be presented as a pilot project for the AFPC. The modules could also be used in grant applications to seek funding for future module development.

It would be recommended that future funding be secured to recruit additional experts to contribute to, develop, and review the current and future modules. It is also recommended that further piloting be conducted with a broader group of high school students to gain feedback from a more general high school population, as opposed to students that are in an extra-curricular leadership group. Additionally, refining the modules using more advanced technology or recruiting an agency to create future modules more professionally would only increase their appeal and user accessibility. Finding collaborative partner agencies to develop an educational program seems like the most feasible approach in developing a sustainable *Teaching Food Systems in Alaska* program.

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## **Appendix**

### **Survey Questions**

#### **Closed-ended questions (Scale from 1-5 with 1 as strongly disagree and 5 strongly agree):**

- The presentation was well-organized and visually appealing.
- The presentation developed your interest in the subject matter.
- The presentation offered you new information.
- The purpose of the presentation was clear to you.
- The subject matter/information in the presentation was challenging enough for you.

#### **Open-ended questions (students will write answers in using their own words):**

- What did you like the most about the presentation?
- What are your suggestions for improving the presentation?
- What did you learn from the presentation?
- What other food related topics would you like to learn about in future presentations?
- Do you have any questions or other comments after viewing the presentation?

The evaluation questions will solicit feedback that will be used to refine the modules

