ABSTRACT

Disease patterns and dietary practices of Alaska Natives differ substantially from the general US population. A wide variety of subsistence foods continue to be commonly eaten in over 200 villages in Alaska; comprehensive composition data are needed for population-specific health research and tribal, state, and federal efforts to improve nutrition through preventive programs and nutrition education. USDA researchers, with contributions from the Alaska Native Dietary and Subsistence Food Assessment Project, are developing a database on the nutrient content of 50+ traditional Alaska Native foods. The number of tribal villages and the diversity in the food supply across tribes necessitated sampling strategies for foods which are fished, hunted, harvested, or prepared by Native methods. Bearded seal meat, seal oil, Beluga whale, caribou, Canadian and snow goose, fermented sheefish eggs, Kukub River broad white fish, preserved hermit, salmon, sheefish, wild blueberries, and blackberries, among others, were collected for analysis or analyzed; analysis for about 100 nutrients are performed using official, validated methods, and under a rigorous quality control program. Data on these foods and from other published sources were or will be released on the US government website and to the tribes.

INTRODUCTION

Foods from the land and sea have nourished Alaska Natives for thousands of years and are still widely eaten, particularly in the over 200 villages of rural Alaska. These foods tend to be more nutrient dense than store-bought alternatives, and are significant sources of protein, mono- and polyunsaturated fatty acids including omega-3s, vitamins A, C, D, and E, and iron and zinc. Native foods not only provide nourishment, but collecting, processing and eating them is critical to preserving culture and providing physical activity. Existing studies, although limited, assessed some of the health outcomes. Daily consumption of seal oil and salmon has been associated with reduced rates of prostate cancer rates in Canadian Inuit (2). In general, Alaska Natives, health professionals and researchers are interested in learning more about the health giving properties of traditional Alaskan foods. However, existing food composition databases contain incomplete information; nutrient data for some foods are nonexistent (e.g., vitamin D, vitamin K), and many of the existing analysis were performed up to 40 years ago; Nobmann found that 93% of analyzed traditional Alaska foods are missing data on folacin content (3). In addition, many foods have never been tested, particularly in the form in which they are preserved and prepared (e.g., dried caribou, fermented sheefish).

This collaboration supports development of a comprehensive and high-quality database on the nutrient content of approximately 50-100 traditional Alaska Native foods, part of a larger USDA American Indian/Alaska Native (AI/AN) Foods Database being developed by the Nutrient Data Lab (NDL). Tribal and public nutrition educators, health professionals, and researchers will gain valuable information in efforts to promote continued consumption of subsistence foods and overcome chronic diseases and health problems facing members of the the Alaska Native population.

METHODS

Food pickup and sample preparation –

• Tribal members and researchers identified and prioritized subsistence foods for sampling.
• Commonly consumed foods donated from 6 village tribes or subsistence foods experts for the project.
• Multiple samples collected within/among villages when possible.
• Foods preserved (dried, frozen, canned, canned) or prepared (boiled, fried or baked) as commonly eaten.
• Foods frozen (~70°F) and shipped on gel ice foods.
• Food Analysis Lab Control Center, Virginia Polytechnic Institute and State University Samples: sample homogenization, QC materials, shipped samples to analytical labs on dry ice.

Sample analysis -

• Analysis for >100 nutrients, i.e., proximates, vitamins, minerals, amino and fatty acids, carotenoids, phytochemicals, and phytonutrients.
• Most assays AOAC International methods:
  - Selenium: AOAC 9986.15 (9.1.01)
  - Folate: AOAC modified 9921515 (50.1.21), microbiological
  - Fatty acids: GLC, CE 1-62 (1997)
• Vitamin D: AOAC 982.29 (modified)
• Quality Control: blanks, duplicates (where sufficient sample is available), spikes, blind control samples, and in-house control samples, e.g., Standard Reference Materials (SRM).
• Internal and external data reviews.
• Sampling of endangered species is approved under the National Marine Mammal Laboratory 792-236 permit, National Oceanic and Atmospheric Agency.

RESULTS

To date, about 20 subsistence foods (plants, fish, game and marine mammals) have been sampled from 6 village tribes in Alaska and have been analyzed for several emerging nutrients of health concern, such as folate, omega-3 fatty acids, selenium, sugars, and vitamin D (Table 1). Other sampled foods not yet analyzed include snow goose, walrus, ringed and spotted seal, and salmon eggs. In addition to this research, the AIAN Foods Database also includes previously published quality data and supportive information (4). Nutrient data for nearly 100 Alaska Native foods are available in the USDA AIAN database, found on the NDL website: www.nal.usda.gov/fsic/foodcomp.

Figure 1 Alaska Native Tribal Areas: Sampling Sites. Sampling and preparation of subsistence foods took place primarily in the Inupiaq (Northwest) and Yupik and Yu’pik regions of Alaska. Top left: Kotlik, Shungnak, Chevak, Kotzebue, Stelbors, Buckland, Point Hope and also the southern site of Chignik. Bottom: Ben Snowball (Yupik) cooks whale meat. Efforts continue to expand collaborations with other tribes and researchers. The focus of analysis continues to be for highly consumed subsistence foods, particularly where limited or no data are available. Ongoing methodology research to resolve analytical challenges (e.g., post-harvest vitamin C deterioration, particularly in berries) parallels this work. In addition to sampling new foods, a quality analysis of previously analyzed foods and harvested foods will continue over time and in different regions of Alaska. This included quality testing of these foods. Sampling of seasonal greens (e.g., wild mudbar) and additional berries are planned for the summer and fall of 2005; sampling of wild fish (e.g. halibut, salmon) and marine mammals from other regions of Alaska is in progress. These new analytical data for tribe-supplied foods are provided to the tribes to support nutrition education, health programs and interventions, and the research community.

REFERENCES