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Contaminants in the Traditional Foods of the Yupik People of St. Lawrence Island, Alaska—Exposure Pathways, Collaborative Interventions, and Prevention

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Background and Objectives: The Yupik people of St. Lawrence Island (SLI), in the Bering Sea region of Alaska, receive disproportionate exposures from contaminants through long-range transport and military sources. Community concerns prompted a study that demonstrated that Yupik serum contained PCB levels significantly above those of the general North American population. Because the Yupik people sustain cultural ways of life that rely on traditional foods, dietary exposure likely is a significant source of the PCBs. Researchers examined Yupik traditional foods for contaminants to inform community decisions and interventions.

Methods: Community researchers, working with traditional hunters, collected 500 samples of the diverse species that people of SLI depend on for their traditional diets. The samples were analyzed using dual-column gas chromatography with electron capture detection.

Results: Results show the meat/muscle tissue for most species and the plant species to be lowest in contaminant concentrations. For unlimited fish consumption, the U.S. Environmental Protection Agency's risk-based consumption limit for PCBs in fish is 1.5 ppb to avoid excess risk of cancer. Concentrations of PCBs in the blubber of marine mammals ranged from 35 ppb in walrus blubber tissue to 450 ppb for PCBs in polar bear blubber. The rendered oil samples contained the highest PCB concentrations of all samples tested other than polar bear blubber, ranging from 200 ppb in bearded seal to 450 ppb in ringed seal.

Conclusion: We conclude that rendered oils and blubber are the major dietary sources of PCBs. Researchers are working with community leadership on SLI to develop collaborative interventions that will eliminate and reduce exposures.