Contaminants in caribou tissues from northern Québec

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Abstract: Recent findings that cadmium, an atmospheric pollutant, was present at relatively high concentration in cervids from southern Québec triggered a study on contamination of caribou tissues. Following the Chernobyl accident, caribou tissues were also investigated for radionuclides. Cadmium concentrations varied according to organ, age, sex and time of collection. In fall, it averaged 27.5 (S.E. = 3.5; n = 50), 2.3 (0.3;40), and 0.1(0.01;17) $\mu g \cdot g^{-1}$ (dry weight) in the kidneys, liver and rumen wall respectively; in skeletal muscles and the heart, mean concentrations reached 0.002 (0.001;33) and 0.003 (0.003;7) $\mu g \cdot g^{-1}$. Lead and mercury were measured in the liver for a smaller number of animals; concentration averaged 1.4 (0.2;41) and 0.7 (0.03;41) $\mu g \cdot g^{-1}$ (dry weight) for the first and the second element respectively. In general, cadmium and mercury levels were higher in Québec animals than in those from Norway, while concentrations were comparable for lead. Only 10-15 percent of cesium 137 present in northern Québec originated from Chernobyl, the rest being due to earlier atmospheric nuclear weapon testing. Among tissues examined, kidneys contained the highest cesium level, followed by skeletal muscles. Mean cesium concentrations in caribou meat varied between 166 (16;4) and 1129 (74;9) $Bq \cdot kg^{-1}$ (wet weight) according to area and month of collection. Caribou feeding habits and regional variation in lichen contamination may explain oberved differences. Those cesium levels were the highest observed throughout northern Canada in 1986-1987. In Québec, the consumption of caribou kidneys and liver is not recommended mainly because of cadmium; consumption of caribou meat poses limited risks with respect to heavy metals or cesium but other natural and artificial radionuclides must be measured before making final recommendations.

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