Concentrations of Mercury and Other Heavy Metals in Furbearers from the Slave River

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Background

This Slave River and Delta Partnership (SRDP) project investigated heavy metals in furbearers commonly harvested by trappers in the Slave River watershed. The concentrations of mercury, cadmium, arsenic, lead and chromium were very low in muskrat, snowshoe hare, mink and beaver, and mercury concentrations have decreased in the livers of muskrat and hare over the last 25 years.

Why is this research important?

Comparing heavy metal concentrations in animals to baseline can assist in monitoring cumulative environmental change over time. It is particularly important to monitor heavy metal concentrations in species people harvest and may use for food.

What did we find?

The concentrations of these heavy metals were very low in the muscle of mink, beaver, snowshoe hare and muskrat. Carnivores, like mink, feed higher in the food chain so they accumulate more mercury than plant-eating animals. This explains why there is higher mercury in mink. This process is known as biomagnification. Researchers found that:

- Average mercury concentrations in the livers of mink and snowshoe hare were lower in the 2013 samples than from studies conducted in the early 1990s.
- Cadmium is commonly found in leafy vegetation like trees and was therefore highest in beaver and snowshoe hare.
- Unlike other heavy metals, arsenic biodiminishes, meaning that higher concentrations of arsenic are usually found lower in the food chain. This was the case with muskrats. They feed on sedges, which are lower in the food chain.
- As lead sticks to soil particles, it is possible that higher lead concentrations are found in beaver and muskrat because these animals build their homes with mud.
- Chromium concentrations were low and relatively consistent among furbearers.

What does this mean?

Results indicate that concentrations of heavy metals that were investigated are low in furbearers near Fort Fitzgerald and in the Slave River Delta. Average mercury concentrations in the livers of mink and snowshoe hare were lower in the 2013 samples than from studies conducted in the early 1990s.

What next?

The same samples have been analyzed for organochlorine concentrations to better understand these pollutants now and how they have changed over time. Results will be analyzed and presented to partner communities.


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What are heavy metals?

Heavy metals are naturally occurring elements in the environment but can also come from man-made sources. At certain concentrations in food or water, heavy metals can be toxic to wildlife and humans.

Are beaver, muskrat and hare safe to eat?

Yes, beaver, muskrat and hare are safe to eat. They are some of the healthiest foods available. The levels of metals in these animals are similar to levels found in meat across Canada. These levels are low and are not of concern to consumers.