



NORTHWEST TERRITORIES CONTAMINANTS FACT SHEETS

Heavy Metals

People in the Northwest Territories are becoming more aware of contaminants in the environment. Heavy metals are one of the major groups of contaminants.

This fact sheet will describe what heavy metals are, where they come from, how people may be exposed to heavy metals, and what this means to the health of people who eat traditional food in the Northwest Territories.

Heavy metals are natural and also come from human sources.

Heavy metals are a group of metals that occur naturally, and most of them can be found in the rocks and soil in the Northwest Territories. Natural weathering of rocks and soil can break them down and release heavy metals into rivers and lakes.

How do heavy metals get into the environment and people?

Heavy metals can be toxic to living things at certain levels. Although they occur naturally, they come from many different sources: some mining industries, burning of fossil fuels, like coal, burning garbage or tobacco, and even forest fires, release heavy metals into the environment.

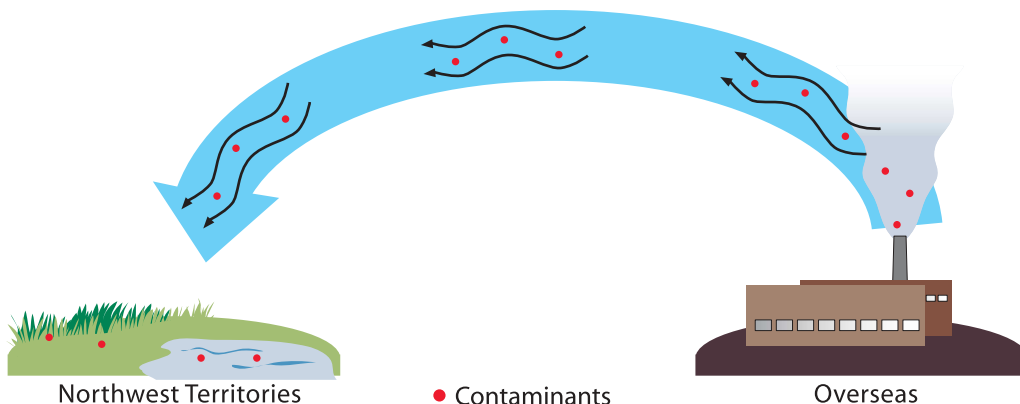
In the Northwest Territories, the heavy metals that cause the most concern are mercury, lead and cadmium. (Discussed in more detail on the following pages.)

Heavy metals last forever and can come from far and near.

Heavy metals last forever, except when broken down by radiation. They do not disappear, but rather they move around the environment. Air and water currents can move heavy metals over great distances. For example, a factory smokestack in Russia can release airborne metals that air currents lift into the atmosphere and deposit on land and water here in the Northwest Territories. This is called long-range transport. Because they can travel from place to place, it is hard to tell if some of the heavy metals present in the Northwest Territories occur naturally or if they are from human sources.

People and wildlife can be exposed to heavy metals.

Heavy metals can be absorbed by plants, wildlife and people through the food they eat. They can also be absorbed through water and breathing. Some heavy metals can become more concentrated when animals (predators) use other animals for food (prey) as part of the food chain. This is called biomagnification.



At elevated levels, heavy metals can cause health problems.

Some metals, such as iron, chromium and copper, are needed in small quantities to keep people and animals healthy. Problems can occur with these metals if the body receives too much of them. Heavy metals such as lead and mercury are never desirable in any amount. Once inside our bodies different metals can build up in different body parts, including the kidney, liver and spleen.

Scientists are learning more about people's exposure to low levels of heavy metals over a long period of time. Research on animals and on people that were accidentally exposed to levels of metals that were much higher than normal, show that they can affect the brain, internal organs, and development. Young children and the unborn are the most sensitive to the effects of heavy metals.

People are taking action on heavy metals.

Unlike other types of contaminants, heavy metals cannot be eliminated since they occur naturally all over the world. Instead, efforts can be made to control the human activities that release them unnaturally into the environment.

Canada is forming agreements with other countries to reduce emissions. One such agreement is the Heavy Metal Protocol of the United Nations Economic Commission for Europe. The agreement deals with mercury, cadmium and lead, and requires new industrial plants to use the best available technologies to reduce heavy metals emissions.

Traditional foods are safe to eat!

Even though some traditional food sources may contain low levels of heavy metals, traditional foods are some of the healthiest foods available. By following any health advisories, you can safely enjoy traditional foods.

Mercury is a naturally occurring heavy metal with hundreds of industrial uses. Many people know of mercury as the silver liquid in old thermometers, but there are also other forms of mercury.

Mercury

Most mercury reaches the environment by volcanoes, weathering of rocks and forest fires. However, this is the least toxic form of mercury. Parts of the Northwest Territories are naturally high in mercury because of the rocks.

Two major human sources of mercury are fuel burning and industrial sources. Hydroelectric dams can flood large areas, and the flooded areas release mercury.

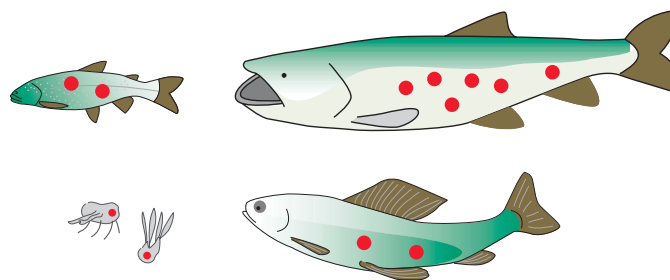
Mercury is the heavy metal of greatest concern in the Northwest Territories. People in the Northwest Territories are mostly exposed to mercury through traditional foods. Mercury in certain forms becomes more concentrated with each step in the food chain. Since beluga and ringed seals are high on the food chain, mercury can be found in elevated levels in their organs.

High levels of mercury can be hazardous to human health, but few people have such high levels.

Elevated levels of mercury can cause health problems. At high levels, mercury is believed to damage the brain, kidneys and developing foetuses. Since mercury can enter the brain, it is believed to be most dangerous for foetuses and children under age five, because their brains are still developing.

Some fish contain more mercury than others.

In fish, mercury levels change depending on the lake, the type of fish, and the age or size of the fish. Usually, smaller fish contain less mercury, and fish that eat mostly insects (like whitefish) have less mercury than fish that mostly eat other fish. Health advisories about mercury in fish are issued in the Northwest Territories when mercury in fish is above guideline levels (see fish fact sheet for list of advisories).



You can choose to reduce the amount of mercury you are exposed to.

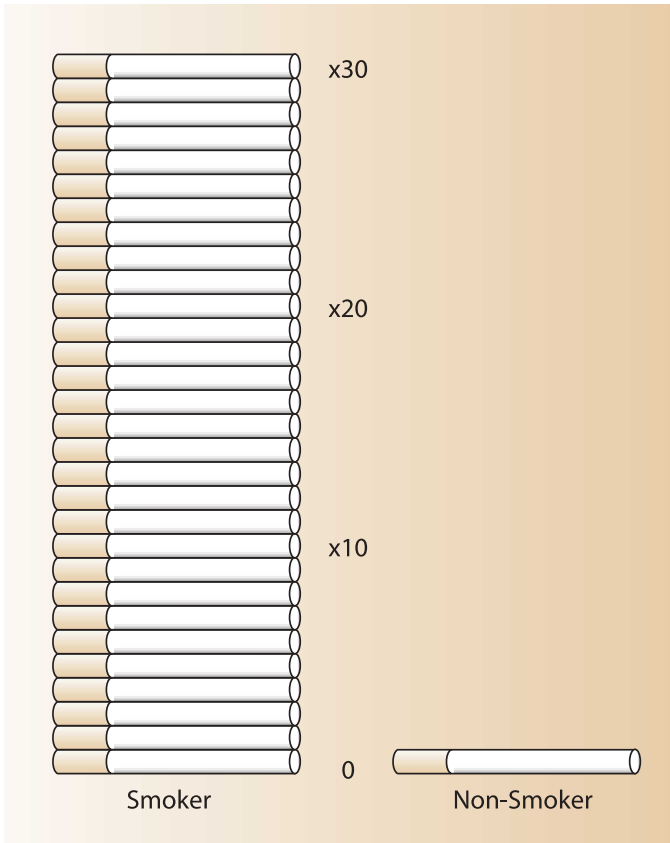
You can reduce the level of mercury by choosing your traditional foods wisely.

To avoid exposure to mercury you can:

- Follow any health advisories related to mercury.
- Eat younger fish and marine mammals.
- Eat fish that are not predators.

Cadmium

Cadmium is a metal that is used in industry because it is very resistant to corrosion. Most of the cadmium in the Northwest Territories is believed to come from local sources, such as natural weathering, mines and burning of fuel and garbage. Most airborne cadmium comes from iron and steel making furnaces in other countries, and from the burning of coal, garbage incineration, cement production, and base metal mines.



People can absorb cadmium through smoking.

Smoking is the largest source of cadmium for people. Cadmium is absorbed by inhaling cigarette smoke. Cadmium can also be absorbed by eating. Once cadmium enters a body, it stays there for many years.

Unlike many other contaminants, cadmium does not increase up most food chains. Sometimes animals lower on the food chain can have more cadmium in them than animals higher up the food chain.

Research has shown that fish and most birds do not accumulate much cadmium. In land mammals and marine mammals, it does not accumulate in meat, but does accumulate in the liver and kidney. Because cadmium stays in the body, levels of cadmium increase with age, in both people and animals. This is called bioaccumulation.

The long-term effects of low cadmium levels on people are not well understood.

It is believed that long-term exposure of people to cadmium in air or food (by eating contaminated organs) could cause kidney disease, lung damage and fragile bones. Cadmium has also been shown to cause cancer.

Different animals from different places have different cadmium levels.

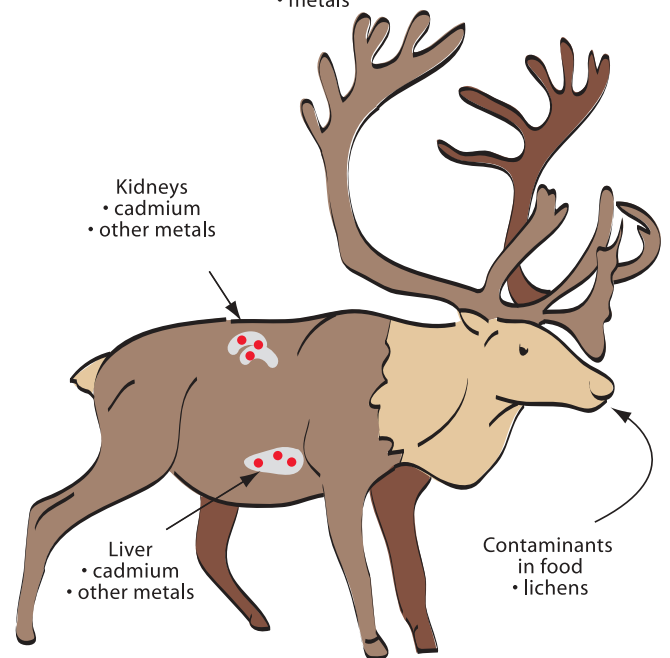
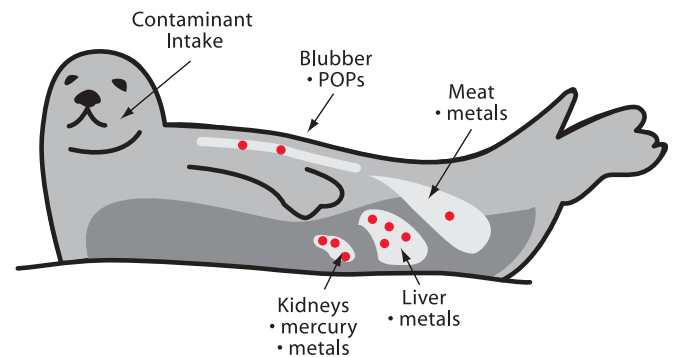
In the Northwest Territories, cadmium is found in ringed seal and beluga whale liver and kidneys.

Cadmium in caribou is found in the kidneys, whereas it is very low in caribou meat.

You can choose to reduce the amount of cadmium you are exposed to.

To avoid exposure to cadmium you can:

- Stop smoking if you are a smoker.
- Avoid breathing fumes from burning garbage.
- Follow any health advisories related to cadmium.



● Contaminants

Lead

Lead can come from natural sources such as volcanoes. Human activities that produce lead include battery production, mining and sewage treatment. Thermal power plants and car exhaust release lead, as does the burning of fossil fuels. Lead was a problem in urban areas with dense traffic because leaded gasolines were used for many years. They are no longer used in Canada.

People can absorb lead through breathing.

Lead is most dangerous when inhaled. Lead can also be accidentally eaten if animals shot with lead shot are not properly cleaned. Once eaten, lead builds up in the liver, spleen, kidneys and bones. Eating small pieces of lead shot can be extremely dangerous.

The long-term effects of low lead levels on people are not well understood.

Pregnant women and children have the highest risks from lead. Long-term exposure to lead can lead to problems with the central nervous system and kidneys, blood disorders, and brain damage. In adults it is believed to slow reflexes, cause weaknesses in joints, and possibly affect memory.

Levels of lead in the environment are dropping.

Due to concerns about human health and the environment, lead was phased out of gasoline from 1973 to 1990. While it was being phased out, lead levels in the atmosphere dropped significantly, and they continue to decrease today.

Good News...



Wildlife in the Northwest Territories generally has very low levels of lead.

Lead levels in beluga and ringed seal are very low. Lead levels are generally low in birds, except where birds were exposed to lead shot.

You can choose to reduce the amount of lead you are exposed to.

To avoid exposure to lead you can:

- Clean any animals killed with lead shot very carefully and soon after they are shot.
- Switch from lead to shot made from steel, bismuth or iron when you hunt.

New laws prohibit the use of lead shot for hunting migratory birds (such as ducks and geese) although is still used for other game (such as rabbits, ptarmigan and grouse).

Levels of lead have been decreasing for over two decades. Lead is no longer considered a major threat to arctic ecosystems.



Did you know...

Smokers are exposed to 20 to 30 times more cadmium than non-smokers! Smokers could consider quitting smoking, rather than avoiding traditional foods, to lower their risk of cadmium exposure.

For more information please contact:

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