



CONTAMINANTS OVERVIEW

ENVIRONMENTAL HEALTH – CONTAMINANTS FACT SHEETS

WHAT DO WE KNOW ABOUT CONTAMINANTS?

There are many types of contaminants in the NWT. The major groups include metals, persistent organic pollutants (POPs) and radionuclides.

In NWT, some contaminants come from local sources, such as mining, but most are transported long distances by the air currents. This is called “long range atmospheric transport” and is one of the major pathways for many contaminants to reach the NWT.

Contaminants that are carried in the air to the NWT can then fall to the ground (or into water bodies) with rain or snow. They are then absorbed by plants, which in turn are then consumed by animals. Runoff from the land can also transport contaminants into lakes, rivers and oceans which can then build up in marine ecosystems.

WHICH TRADITIONAL FOODS HAVE HIGHER LEVELS OF CONTAMINANTS?

There are two main factors that determine the levels of contaminants in traditional foods:

1. Age of animal: Contaminants can **bioaccumulate** (or build up) in animals as they get older. Many contaminants are eliminated from the body, but in some cases the rate of absorption is greater than the rate of elimination. For this reason, an animal will slowly build up the level of contaminants in their body. This process of **bioaccumulation** leads to older animals having higher levels of contaminants than younger animals.
2. Predatory or non-predatory: Contaminants can **biomagnify** up through the animal food chain. To explain this process, we can use the example of the food chain “lichen – caribou – wolf”. Lichen can absorb contaminants from the surrounding environment. Caribou who eat this lichen will absorb the contaminants that were found in the

lichen. Caribou will eat a lot of lichen and so they will contain higher levels of contaminants than the lichen contained. Wolves will then hunt the caribou. One wolf may eat many caribou and so the wolf will have higher levels of the contaminants than the caribou did. This process of **biomagnification** leads to animals at the top of the food chain usually having higher levels of contaminants than animals that are lower in the food chain.

To summarize, older animals and animals at the top of the food chain (predators) tend to have higher levels of contaminants than younger animals and animals at the bottom of the food chain (plant eaters). Land animals also tend to have lower levels of contaminants than marine mammals, because the marine food chain is very long and because marine mammals are at the top of their food chain.



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WILDLIFE MONITORING

There are many studies every year in the NWT that look at contaminants in wildlife. These studies tell us what levels of contaminants are in different parts of an animal (e.g. liver, kidneys, muscle, and fat), what locations tend to have higher levels of contaminants (spatial trends) and whether levels are going up or down over time (temporal trends).

Wildlife monitoring studies are important; as they provide information that can be used to determine human exposure to the contaminants; however they are limited in their ability to assess human health risks due to the many other factors that determine whether human health effects will occur.

FISH MONITORING

Much of the wildlife monitoring that occurs in the NWT is focused on mercury in fish. There have been many cases where predatory fish (e.g. Northern Pike, Lake Trout, and Walleye) have been found to have elevated levels of mercury in their muscle tissue. Consumption advice is issued by the Chief Public Health Officer when these elevated levels are found. For more information on fish consumption in the NWT, the following resources can be found on the GNWT Health and Social Services website

(<http://www.hss.gov.nt.ca>):

- NWT – Mercury Levels in Fish – Fish Consumption Notices Map
- General Fish Consumption Guidelines
- NWT Sport Fishing Regulations Guide (for more information on individual species)
- Contaminants Fact Sheets (for more information on individual species)

HUMAN BIOMONITORING

Researchers use human biomonitoring studies to directly measure the levels of contaminants that are in people. They will take tissue samples, such as hair or blood, and then test them for metals or POPs. For some contaminants, such as mercury, there are blood guidelines that Health Canada has established and that researchers can compare their results to in order to determine whether a person is at risk for experiencing health effects. Sometimes Health Canada may have separate guidelines for the general population and for

sensitive subgroups (e.g. pregnant women, and children under 12). However, in many cases, especially with POPs, there are no established guidelines and so researchers will often look at time trends instead. This means that they will take one sample at one time and then at a later time they will take another sample (often years later). They will then look at whether the levels of that particular contaminant have gone up or down. Human biomonitoring studies are very expensive, but they are important for understanding human exposure to contaminants and help identify potential health risks.





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HOW DO CONTAMINANTS AFFECT HUMAN HEALTH?

There are many factors that affect whether a person will experience any health effects from contaminant exposure. These factors include the dose (how much), the duration (how long), the route or pathway by which you are exposed (breathing, eating, drinking, or skin contact), the other chemicals to which you are exposed, and your individual characteristics such as age, gender, nutritional status, family traits, life-style, and state of health.

Exposure to different contaminants can lead to different health effects. These are explained on each individual fact sheet.

Many contaminants can be found in the environment naturally, and some (such as selenium) are even required by the body in small amounts for good health. It is important to remember that just because something is present, does not mean that a person will experience adverse health effects. For many of these contaminants, high levels of exposure are required in order to experience any health effects and in the majority of cases, the benefits of consuming traditional foods outweigh the risks of contaminant exposure. Avoiding traditional foods and increasing market foods in the diet introduces an even greater risk to chronic diseases, such as diabetes, osteoporosis and cardiovascular disease.

IN LIGHT OF THESE ENVIRONMENTAL CONTAMINANTS, ARE TRADITIONAL FOODS SAFE TO EAT?

Yes! Traditional foods are safe to eat. They are also some of the healthiest foods available. The benefits of consuming traditional foods are much greater than the risks of contaminant exposure in the majority of cases. Check the

GNWT Health and Social Services website for current consumption notices <http://www.hss.gov.nt.ca>.

By following consumption notices, you can safely enjoy all traditional foods.