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University of Kentucky
College of Agriculture,
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Body Balance: Protect Your Body from Pollution with a Healthy Lifestyle

Cut Down on Environmental Pollutants in Your Food

Environmental pollutants in food are concerning. Foods like fish may be contaminated with mercury and polychlorinated biphenyls (PCBs). Fruits and rice may contain arsenic. High-fat meat and dairy products may also contain chemicals from pollution that aren't healthy for your body. Read on to learn how to choose foods with fewer pollutants, which can help keep the body healthier and lessen the risk of chronic diseases.

What is Pollution?

Hazardous chemicals, such as heavy metals and persistent organic compounds, pollute our natural environment and are found in air, water, soil, and sediments, as well as our food. Certain foods collect pollutants more easily than others. Exposure to these substances can contribute to increased health risks, if they occur for long enough at high enough levels. Research has shown some hazardous chemicals may cause the body to be more vulnerable to medical conditions such as cardiovascular disease, diabetes, and cancer.

Figuring out Healthy Fish

Fish is a healthy protein choice, but some types are more susceptible to having more pollution than others. Choosing types of fish low in pollution is the best way to receive the health benefits of fish while keeping exposure to pollution low.

Why eat fish?

- Provides high-quality protein and contains many essential nutrients
- Good source of several B vitamins, including thiamin, riboflavin, niacin, B6, B12, as well as vitamins D and E
- An alternative to meat and poultry

- Lower in saturated fat than other animal proteins
- Aids in growth and development
- Heart-healthy, because certain fish contain omega-3 fatty acids. Research shows that regular intake of omega-3 fats is associated with a decreased risk of cardiovascular diseases.
- Practicing the following recommendations will help make sure you receive the health benefits of fish without consuming too much mercury.

How does pollution get into fish?

Small amounts of mercury are naturally found in the ground. Mercury is also released in small amounts through industrial processes, such as burning coal, oil, or wood as fuel. Once mercury is in the air, it falls back to the ground, and it can build up in streams and oceans. Bacteria living in the water may cause the mercury to change into a toxic form known as methylmercury. This toxic mercury may build up in organisms living in the water, especially fatty fish. Methylmercury is toxic to humans and is particularly harmful to the brain and nervous system. The Food and Drug Administration (FDA), working with the Environmental Protection Agency (EPA), has developed the following guidelines for consumers to follow when eating fish.

What are the healthiest ways to eat fish?

- The EPA recommends limiting intake to two meals of fish per week and choosing fish low in mercury. The fish listed below are all considered safe choices to reduce the risk of consuming fish contaminated with mercury pollution while still getting the health benefits consuming fish has to offer.
- Fish usually **low** in mercury:
  - Canned light tuna
  - Catfish
  - Pollock
  - Salmon
  - Shrimp
- Fish that tend to be **high** in mercury:
  - Shark
  - Swordfish
  - King Mackerel
  - Tilefish
  - Albacore Tuna
- Those who might become pregnant, are pregnant or breastfeeding, young children, or older adults should limit the intake of fish that might be contaminated with mercury. Pregnant or breastfeeding woman should avoid eating fish that tend to be high in mercury but are encouraged to eat a variety of fish that are lower in mercury because these fish contain many nutrients for both the mother and baby.
- PCBs are also pollutants found in fish, though testing for PCBs may vary by state and region. PCBs build up in the fat of fish and can be reduced by removing fat when cleaning and cooking fish. Most states have safe eating

guidelines for specific waters and age groups, particularly for pregnant women, women planning to become pregnant, and children under age 15.

- Visit the Kentucky Department of Fish & Wildlife Resources to learn about the most current fish consumption advisories in Kentucky (http://fw.ky.gov/Fish/Pages/Fish-Consumption-Advisories.aspx).

What about Arsenic?

What is arsenic and where is it found?

Arsenic is a natural substance that is commonly found in our water, soil, and air. Arsenic often forms naturally when rocks break down. Higher amounts of arsenic can form at mining sites or when smelting minerals or metals from ore. Some pesticides also contain arsenic.

Why is arsenic bad?

Studies show being exposed to too much arsenic increases the risk of skin, bladder, and lung cancer. Arsenic may increase the risk for heart disease and diabetes.

How are people exposed to arsenic?

- Rice can contain arsenic where soils are high in arsenic.
- Fruit and fruit juices may contain arsenic.
- Smoking exposes people to high levels of arsenic.

How can people avoid arsenic?

- The FDA has been testing fruit juices for arsenic since 1991. If the juice contains too much arsenic, it does not find its way to the grocery shelf for sale. Currently, the FDA is considering setting maximum limits for arsenic levels in other foods.
- Choose rice and other grains that tend to be low in arsenic.
  - White rice grown in California, Pakistan, and India and sushi rice from the U.S. tend to have the lowest levels of arsenic.

- Brown rice tends to have higher levels of arsenic than white rice. Brown basmati rice from California, Pakistan, and India has less arsenic than brown rice from the rest of the U.S.
- Other whole grains, such as quinoa, buckwheat, and millet, are low in arsenic.
- Foods that contain rice flour or brown rice syrup in the ingredient list may have higher levels of arsenic. If rice is frequently consumed, such as part of a gluten-free diet, consider choosing products made without these.
- Cooking rice using extra water can remove about half of the arsenic it contains. Use six cups of water per cup of rice, then cook normally on the stove. Drain off the excess water when the rice is fully cooked.

- Wash all fruits and vegetables before cooking or eating them. Use a scrub brush on thick-skinned fruits and vegetables to remove any soil that may contain arsenic.
- People with home gardens in areas with high arsenic soil content can limit their exposure by thoroughly washing all produce from the garden. Be sure to remove all soil particles from produce. Peel root vegetables (beets, turnips, carrots, radishes, and potatoes) and avoid composting the peels as they may contain arsenic.

Choosing and Cooking Healthy Meat and Dairy

Avoid Pesticide Residue

Pesticides tend to collect in the fat of meat and dairy products. Because of this, it is best to choose low-fat meat and dairy products, such as reduced-fat cheese and milk. Also, trimming the visible fat from meat helps reduce consumption of pesticides. Reducing animal fats helps to reduce exposure to pollutants in foods, which can help reduce the risk of chronic disease and some cancers.

Grilling and High Temperature Cooking

Cooking meat at high temperatures, such as pan-frying or grilling, isn't the healthiest choice. Research has shown meats cooked with direct heat form substances that may increase cancer risk. These substances make it harder for the body to fight off cancer and make it easier for cancer to spread in the body. This is especially true for high-fat meats, meats that are charred or smoked, and meats cooked at above 300 degrees Fahrenheit. Here are a few recommendations to limit your exposure to forming harmful substances:

- Reduce consumption of charred meat.
- Avoid using fat drippings from meat cooked at high temperatures.
- Cook meats for a longer period of time at a lower temperature.

- Use a microwave to cook meat, or to partially cook meat before grilling so there is less time for harmful substances to form.
- If grilling or pan frying, flip the meat frequently. This may reduce the amount of harmful substances formed.

Summary

Many foods that are regularly consumed may contain pollutants. Examples are mercury and PCBs in fish, and arsenic contamination in rice. Simple things such as trimming the fat from meat and choosing low-fat dairy are effective ways to reduce exposure and improve health. The University of Kentucky is a participant in the Superfund Research Center (SRC), which conducts ongoing research on the effects of pollutants and hazardous chemicals on the environment and on the body. For more information, see Inter-Program (IP) publications 76 and 77. Good nutrition is one of our best defenses for staying healthy, even in the presence of environmental pollutants. Strive to lead a healthy lifestyle to protect your body from the negative effects of pollution.

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