

[Farm-Raised Salmon Contain More Toxins Than Wild Salmon](#)

Science, January 9, 2004

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Background and importance of the study:

Most people want to have a good, balanced diet that will improve their health and lower their risk of serious diseases such as breast cancer. A common recommendation for a healthier diet is to eat more fish and less red meat (beef). Red meat is high in saturated fat, which may be associated with a higher risk of heart disease. In contrast, some studies suggest that the fat in fish may actually protect people from heart disease. (C. Albert et al., *New England Journal of Medicine*, Vol. 346, 2002; F. Hu et al., *Journal of the American Medical Association*, Vol. 287, 2002.)

Over the past 25 years, salmon has become an extremely popular fish. To meet the increasing demand, salmon farms—where the fish are kept, fed, and netted—have been created. Most of the salmon eaten in the United States comes from this type of farm, rather than being caught in the wild (rivers or oceans where the fish swim freely).

Recently, scientists have begun raising questions about possible health risks posed by fish raised on farms.

Here's the problem: Farm-raised fish are fed pellets of concentrated fish products. These pellets are made by drying and grinding up fish that are picked up in fishing nets but aren't the types of fish people usually eat. Fish bones, skin, and guts are all part of the mix. The resulting pellets include not just the fish parts, but whatever toxins (harmful chemicals) have built up in the fish's body over their lifespan. Some of these toxins come from environmental pollutants and are stored in the fatty part of the fish, right under the skin.

When farm-raised fish are given the concentrated fish pellets, they take in concentrated chemical toxins. When wild "free range"

salmon eat the fish that are in their environment, they take in regular levels of toxins (not concentrated). For example, one meal of pellets may contain the dried and compressed body parts and toxins from several whole fish. But the same amount of food for a wild salmon would consist of just a few bites of one fish.

In this study, researchers compared the toxin levels in farmed and wild salmon to the levels considered acceptable by the U.S. Environmental Protection Agency (EPA).

Study design: Researchers collected more than 700 salmon samples from seafood wholesalers and retailers in several cities around the world. They analyzed the salmon to see how much of four common toxins—all industrial or pesticide chemicals that pollute the environment—each fish sample contained. The chemicals they looked for were PCB (polychlorinated biphenyl), dioxin, toxaphene, and dieldrin. All of these are suspected to cause cancer in people.

The scientists compared the levels of the toxins in farm-raised and wild salmon. They also ranked countries, cities, and states by the amounts of toxins found in salmon there. In addition, they examined 13 samples of fish feed given to farmed salmon to measure the food's toxin levels. Then, based on the EPA health guidelines, the researchers figured out how much salmon they considered safe to eat, given the toxin amounts found in the fish.

Study results: The researchers found that farmed salmon had significantly more toxins than wild salmon. Specifically, they found that:

- Chile and Washington State had the least contaminated farmed salmon. Yet even the farmed fish from those areas had significantly higher amounts of PCBs, dioxins, and dieldrin than wild salmon from the same areas.
- Farmed salmon from Europe had significantly higher toxin levels than farmed salmon from North and South America.
- The fish feed samples had toxin amounts similar to, or greater than, those found in farmed salmon. This suggests

that the feed may be the source of toxins in farmed salmon.

Conclusion: After comparing toxin amounts with EPA health guidelines, the researchers made these recommendations:

- People should eat farmed salmon no more than once a month to avoid risk from the cancer-causing toxins they contain.
- It is safe to eat as many as eight meals of wild salmon a month.

The researchers noted that they based their recommendations on the EPA guidelines and not the levels of toxins considered acceptable by the United States Food and Drug Administration (FDA). They said this was because the FDA levels are not strictly health-based and do not take into consideration exposure to more than one toxin at a time. The FDA also does not give specific guidelines as to acceptable levels of toxaphene and dioxins in fish.

They also recommended that salmon sold in stores and restaurants be labeled as farmed or wild, to help consumers find the less contaminated type. And they recommended conducting more studies on toxins in fish feed given to farmed salmon.

Take-home message: This study suggests that what seemed like a no-brainer—the decision to make your diet healthier by eating more fish—isn't as simple as it seems. Although fish may have significant health benefits, those raised on farms may actually pose a cancer risk because of the toxins they contain.

One way to get around this is to look for and buy only wild salmon. But this can be expensive: Wild salmon can cost twice or even three times as much as farmed salmon, and it's not as widely available.

So should you go back to beef? That seems risky, not only because of the saturated fat but because land animals on farms are also fed diets that might include high levels of toxins.

More studies are needed on all types of meat and fish to see whether high levels of toxins in the animals' diets get into their meat. Such studies might lead farmers to change the types of feed

they give to animals to lower the toxin levels and make their meat safer to eat.

If you're very worried about this issue, the safest bet for now is probably to stick to fish that you know has been caught in the wild, and cut out farm-raised fish from your diet. Or you may want to cut down on all types of meat and try the many excellent vegetarian sources of protein, including soy, other beans, and nuts.