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## News Release

### **First Global Study Reveals Health Risks of Widely Eaten Farm Raised Salmon** *Science Magazine Study Suggests Sharp Restrictions in Consumption*

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ALBANY, N.Y. (January 9, 2004) -- A study published in this week's *Science* found significantly higher levels of cancer-causing and other health related contaminants in farm-raised salmon than in their wild counterparts. The study, by far the largest and most comprehensive done to date, concluded that concentrations of several cancer-causing substances in particular are high enough to suggest that consumers should consider severely restricting their consumption of farmed salmon. In most cases, consumption of more than one farmed salmon meal per month could pose unacceptable cancer risks.

The majority of salmon served in restaurants and found on grocery store shelves is farmed rather than wild.

The study's authors, seven U.S. and Canadian researchers representing fields from toxicology to biology to statistics, analyzed fillets from about 700 farmed and wild salmon produced in eight major farmed salmon producing regions around the world and purchased in 16 large cities in North America and Europe. Salmon samples were drawn to be representative of the salmon typically available to consumers around the world.

The researchers found significantly higher concentrations of contaminants in farmed salmon versus wild. In particular, four substances that have been well studied for their ability to cause cancer-PCBs, dioxins, dieldrin, and toxaphene-were consistently and significantly more concentrated in farmed salmon.

#### Geographic Differences

Among the study's conclusions, salmon farmed in Europe were generally more contaminated than farmed salmon from North or South America. Farmed salmon purchased for the study from supermarkets in Frankfurt, Edinburgh, Paris, London, and Oslo were the most contaminated and triggered consumption recommendations of one-half to one meal per month-based on U.S. Environmental Protection Agency (EPA) consumption advisories for these contaminants. A meal was considered to be an eight-ounce portion.

Farmed salmon purchased from supermarkets in Los Angeles, Washington, D.C., Seattle, Chicago, New York, and Vancouver triggered a recommendation of no more than two meals per month.

Slightly more variation was found in fish purchased in North America than those purchased in Europe. While farmed salmon purchased for the study in New Orleans and Denver were generally least contaminated-triggering a recommendation of about three meals per month-farmed salmon purchased in Boston, San Francisco, and Toronto triggered the more stringent consumption recommendations of the European fish.

"Ultimately, the most important determinant of risk has to do with where the fish is

farmed not where it is purchased," said David Carpenter, an author of the study and director of the Institute for Health and the Environment at the University at Albany. "And because it's a global market, it's hard to be sure what you're getting."

According to Carpenter, "Just because Europeans have the most contaminated farmed salmon, this doesn't mean American consumers shouldn't be concerned."

With very few exceptions, farmed salmon samples tested significantly exceeded the contaminant levels of wild salmon, which could be consumed at levels as high as eight meals per month. Even the least contaminated farmed salmon, from Chile and the state of Washington, had significantly higher levels of PCBs, dioxins, and dieldrin than wild salmon.

#### Contamination Likely Related to Feed

The study concluded that the contamination problem is likely related to what salmon are being fed when they're on the farm. While wild salmon eat a diverse buffet from small aquatic organisms like krill to larger fish, farmed salmon are fed a concentrated and high fat mixture of ground up fish and fish oil. And since chemical contaminants a fish is exposed to during its life are stored in its fat, the higher fat "salmon chow" passes along more of these contaminants to the farmed salmon.

The study's results confirmed this possibility when it found higher contaminant concentrations in salmon feed from Europe than feed from North and South America, a result roughly consistent with contaminant levels in European and American salmon.

#### Consumption Advisories and Recommendations

Given the overall contaminant levels found, EPA and many state consumption advisories would suggest that American consumers restrict their consumption of farmed salmon to no more than one meal per month. European consumers should restrict their consumption to one meal every other month (or less than one meal per month). Nevertheless, the authors point out that it is possible for Americans to purchase farmed salmon with contaminant levels more typically found in Europe.

To make it easier for consumers to follow that advice, the authors recommended that the government require clear and prominent labeling of farmed and wild salmon as well as the country of origin of all farmed salmon. The authors also said their results strongly reinforced the recommendations of a July 2003 National Academy of Sciences report on dioxins in the food supply which called for reducing dioxin levels in animal feed such as fishmeal.

Since contaminants build up in the fatty tissue of the fish, the authors point out that consumers may be able to reduce their consumption of contaminants in farmed salmon by following the recommendations of many state governments and the federal government to remove as much skin and visible fat as possible. However, it is difficult to determine how much of the contaminant load can be removed in this way.

In assessing the human health risks of consuming farmed salmon, the authors of the study used U.S. EPA consumption guidance for PCBs, toxaphene, and dieldrin covering sport caught fish rather than U.S. Food and Drug Administration (FDA) standards for these substances governing commercially-sold fish. "Because the FDA standards consider things like technology and costs to the industry, they were never designed to consider exclusively health risks-which was the only thing we were looking at in the study," according to UAlbany's Carpenter.

"Plus," said Carpenter, "the health information FDA did use to help set the standards for these substances is almost 20 years out of date. Not only are they out of step with other agencies of the federal government-such as the EPA and the Centers for

Disease Control-but they're also out of step with health standards for most of these substances set in Europe, Japan, and Canada."

Carpenter said, "It's this vast difference in regulatory approach that explains why farmed salmon with these levels of contaminants could trigger such restrictive consumption recommendations of EPA but still be sold legally in the U.S."

The annual global production of farmed salmon has increased 40 times during the last two decades-making inexpensive salmon available to consumers year-round. Between 1987 and 1999, salmon consumption increased at an annual rate of 14 percent in the European Union and 23 percent in the U.S. Japanese salmon consumption doubled between 1992 and 2002. Since 2000, more than half of the salmon eaten globally has been farmed, coming primarily from fish farms in Northern Europe, Chile, Canada, and the United States.

The results of the study are consistent with, but much broader than, conclusions of three other peer reviewed studies. But while those pilot studies analyzed anywhere from eight to 13 salmon samples, the Science study looked at more than 700.

For the complete study, go to <http://albany.edu/ihe/salmonstudy/> at UAlbany's Institute for Health and the Environment.

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*The University at Albany's broad mission of excellence in undergraduate and graduate education, research and public service engages 17,000 diverse students in nine degree-granting schools and colleges. The University has launched a \$500 million fundraising campaign, the most ambitious in its history, with the goal of placing it among the nation's top 30 public research universities by the end of the decade. For more information about this internationally ranked institution, visit <http://www.albany.edu/index.html>. For UAlbany's extensive roster of faculty experts, visit [www.albany.edu/news/experts.htm](http://www.albany.edu/news/experts.htm).*

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