



health concerns

Chemical Contaminants

A number of recently published studies raise concerns that should be considered when assessing the health benefits of eating farmed salmon. While a great deal of research on chemical contaminants in farmed salmon has isolated a single persistent organic pollutant (i.e., PCBs), consumers also need to be concerned about interactions between chemicals. In a global assessment of farmed salmon thirteen persistent organic pollutants were found.¹

Each of these chemicals measured ten times greater in farmed salmon than in their wild counterparts with some regional variations. These include: PCBs, dieldrins, toxaphenes, dioxins and chlorinated pesticides. Almost all of the contaminants found in farmed salmon are known as “probable” or “possible” human carcinogens according to the United States Environmental Protection Agency (USEPA).

Utilizing the USEPA consumption advisory for cancer the following consumption restrictions for the general public are advised for farmed salmon:²

- North America - 1 serving every 2.5 months;
- South America - 1 serving per month; and
- Europe - 1 serving every 5 months.

Many consumers choose salmon because it is known as a beneficial source of omega-3 fatty acids. However, a 2005 study published in the *Journal of Nutrition* compared the health benefits of farmed salmon to health risks. The study found that consumers, especially young children and women of child-bearing age, concerned about health impairments—such as reduction in IQ and other cognitive and behavioral effects—can minimize their exposure to cancer causing contaminants by choosing wild salmon or by selecting other sources of omega-3.³

The most recent research published in the *Journal of the American Medical Association* (October 2006) encourages the overall consumption of seafood for its health benefits. However, the study still provides evidence showing wild salmon as a less contaminated source of omega-3 than farmed salmon.⁴

COASTAL ALLIANCE FOR AQUACULTURE REFORM

David Suzuki Foundation • Friends of Clayoquot Sound • Georgia Strait Alliance • Living Oceans Society
Musgamagw Tsawataineuk Tribal Council • Raincoast Conservation Society • Raincoast Research
T. Buck Suzuki Environmental Foundation • Watershed Watch Salmon Society
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Antibiotics and Pesticide Use

Due to the stressful high density conditions of open net-cage feedlots in which farmed salmon are reared, a wide range of antibiotics and SLICE, a treatment for sea lice, which has a pesticide as the active ingredient, are administered to fish through their feed. The trend in the industry, according to BC Ministry of Agriculture and Lands data, has been an increase in the use of antibiotics per tonne of production over the last years reported and a steady dependence on SLICE.⁵ The industry continues to rely on these treatments, administered in net-cages open to the ocean, despite growing concerns over antibiotic resistance⁶ and chemical contamination affecting both humans and the environment.⁷

Additives and contaminants present in farmed salmon may include: Ivermectin, emamectin benzoate, oxytetracycline, florfenicol, Romet 30, sulfadimethoxine and ormetoprim, sulfadiazine and trimethoprim, tricaine methanesulfonate, formaldehyde, florfenicol and hydrogen peroxide.⁸

Colourants and Additives

While wild salmon get their colour naturally from the food they eat, farmed salmon feed must have the colourants canthaxanthin and astaxanthin added. Without these colourants being added to their feed farmed salmon would be an unappealing grey colour. Salmon farming companies can choose the colour of their end product—preferring the vibrant red that consumers associate with healthy, wild salmon.

For those looking for a healthy food item, the list of additives and residual contaminants that may be found in farmed salmon reads like a pharmaceutical prescription. Consumers need to be informed about the risks so that they can make healthy decisions for themselves and their families.

“Antimicrobial resistance [the resistance to drugs once capable of destroying disease-carrying microorganisms] is an emerging global health issue that, if not addressed, may evolve into one of the most significant public health challenges worldwide.”

— Canadian Veterinary Drugs Directorate

¹Hites, R.A., J.A. Foran, D.O. Carpenter, M.C. Hamilton, B.A. Knuth and S.J. Schwager. (2004). Global Assessment of Organic Contaminants in Farmed Salmon. *Science*. 303: 226-228.

²Huang, X., R.A. Hites, J.A. Foran, M.C. Hamilton, B.A. Knuth, S.J. Schwager and D.O. Carpenter. (2005). Consumption advisories for salmon based on risk of cancer and noncancer health effects. *Environmental Research*. 101(2):263-274.

³Foran, J.A., D.H. Good, D.O. Carpenter, M.C. Hamilton, B.A. Knuth, and S.J. Schwager. (2005). Quantitative Analysis of the Benefits and Risks of Consuming Farmed and Wild Salmon. *Journal of Nutrition*. 135: 2639-2643.

⁴Mozaffarian, D. and E.A. Rimm. (2006) Fish Intake, Contaminants, and Human Health: Evaluating the Risks and the Benefits. *Journal of the American Medical Association*. 296(15): 1885-1899.

⁵Ministry of Agriculture and Lands, British Columbia (2006). *Antibiotics Usage Graph and Sea Lice Products Usage Graph*. http://www.al.gov.bc.ca/ahc/fish_health/antibiotics.htm

⁶Cabello, F.C. (2006) Heavy use of prophylactic antibiotics in aquaculture: A growing problem for human and animal health and for the environment. *Environmental Microbiology*. 8(7):1137-1144.

⁷DeBruyn, A.M., M. Trudel, N. Eyding, J. Harding, H. McNally, R. Mountain, C. Orr, D. Urban, S. Verenitch and A. Mazumder. (2006). Ecosystemic effects of salmon farming increase mercury contamination in wild fish. *Environmental Science and Technology*. 40(11): 3489-3493.

⁸Access to Freedom of Information Act. (2005). *2003 and 2004 Finfish Aquaculture Waste Control Regulation (FAW-CR)*, Annual reporting information for Mainstream Canada.

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