

## **Preliminary examination of contaminant loadings in farmed salmon, wild salmon and commercial salmon feed**

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### **Abstract**

This pilot study examined five commercial salmon feeds, four farmed salmon (one Atlantic, three chinooks) and four wild salmon (one chinook, one chum, two sockeyes) from the Pacific Coast for PCBs (112 congeners), polybrominated diphenylethers (PBDEs - 41 congeners), 25 organochlorine pesticides (OPs), 20 polycyclic aromatic hydrocarbons (PAHs), and methyl and inorganic mercury. The farmed salmon showed consistently higher levels of PCBs, PBDEs, Ops (except toxaphene) than the wild salmon. The mean concentrations in pg/g were 51,216 vs 5302 for total PCBs; 2668 vs 178 for total PBDEs; 41,796 vs 12,164 for total OPs (except toxaphene). The farmed salmon levels are likely a consequence of the elevated level of contamination found in the commercial salmon feed (mean concentrations in pg/g were 65,535 for total PCBs; 1889 for total BPDEs; 48,124 for total OPs except toxaphene). Except for a single high wild chinook value, PAHs were highest in the feed samples followed by the farmed fish and the three other wild fish. The Bio-Oregon-1996 feed of hatchery origin showed a level of PAHs ten times higher than any other feed. The genotoxic implications of such a high PAH level are considered for juvenile chinook salmon. Toxaphene and methyl mercury concentrations were not notably different between the wild and farmed salmon. There was no clear low contaminant brand of salmon feed. The human health implications of eating farmed salmon are considered from the perspective of the current WHO and Health Canada (2000) tolerable daily intake (TDI) values for PCBs. Based on a TDI of 1 pg TEQ/kg bw/day, this analysis indicated a safety concern for individuals who on a regular weekly basis consume farmed salmon produced from contaminated feed.

**Keywords:** Salmon; PCBs; Brominated diphenyl ethers; PAHs; Mercury; Organochlorine pesticides; Salmon farming; Risk assessment

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