

## Nutritional Value of British Columbia Farmed Salmon

The omega-3 highly unsaturated fatty acids EPA and DHA are considered to be the most important fatty acids for human health. These fatty acids have been shown to be important for cognitive development and the reduction of risks of some types of cancer, depression, Alzheimer's and inflammatory diseases (Sidhu, 2003; Cheatham *et al.*, 2006). Consumption of EPA and DHA are especially important in the prevention of coronary heart disease. If North Americans were to increase their intake of EPA and DHA to 250mg per day, death from heart disease could be reduced by 36% (Mozaffarian and Rimm, 2006).

Since marine organisms are the chief producers of EPA and DHA, fish are an excellent source of these fatty acids. Generally high fat fish are more likely to contain elevated levels of EPA and DHA. Since Atlantic salmon naturally have higher levels of fat than Pacific salmon they are richer source of these fatty acids.

Following the publication of the 2004 Hites Science study, there has been concern regarding the presence of polychlorinated biphenyls (PCBs) in fish destined for human consumption. PCBs are synthetically produced organic molecules which were manufactured for industrial use up to the late 1970's and early 1980's. Since their production has ceased, environmental levels have been decreasing, but these compounds remain in our food chain because of their slow decay. PCBs have low water solubility therefore are passed from one organism to the next through the consumption of fat (Health Canada).

However, unlike the situation for wild salmon, the diet of farmed Atlantic salmon can be carefully controlled. Historically farmed salmon have been fed diets based primarily on fishmeal and fish oil. Recent advances in fish nutrition have shown that fish do not have a nutritional requirement for these ingredients but rather a requirement for specific amino acids (the building blocks of protein) and specific fatty acids (the building blocks of fats).

Since the publication of the Hites report in Science:

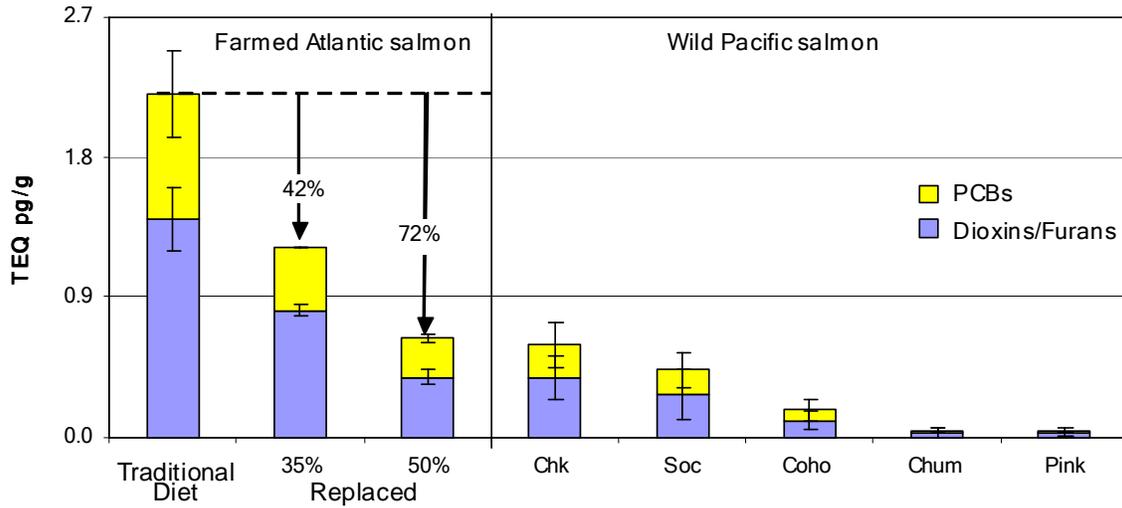
- British Columbia has become an industry leader in alternative feed technology.
- Use of alternative feed ingredients has resulted in flesh PCB levels in the same range as Wild Pacific Chinook and Sockeye (See Figure 1).
- British Columbia farmed salmon remains a richer source of EPA and DHA than wild Pacific salmon (See Figure 2).

When evaluating the Risks<sup>1</sup>:

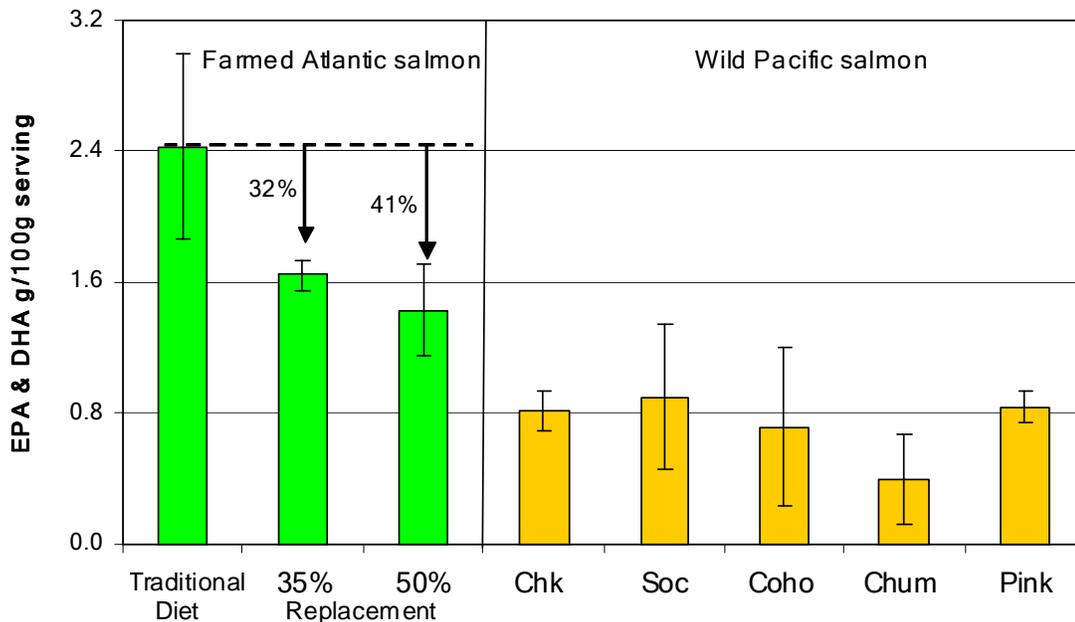
- To meet the daily recommended requirement of 250mg/day of EPA and DHA, only 122g of farmed salmon needs to be consumed per week.
- The level of PCBs in farmed salmon is 200 times less than the US FDA and Canadian CFIA legal limit of 2000 ppb in edible fish products.

<sup>1</sup> For this example, the risk was evaluated using data from the farmed salmon fed the 50% replaced diet.

## Figures



**Figure 1** Measured level of PCBs in British Columbia farmed and wild salmon. (Data from Friesen *et. al* 2008, published in Environmental Science and Technology)



**Figure 2** Measured levels of EPA and DHA in a serving of British Columbia farmed and wild pacific salmon. (Data from Friesen *et. al* 2008, published in Environmental Science and Technology)

## References:

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