

## Study Confirms Farmed Rainbow Trout Extremely Low In Mercury

Why the concern about mercury content in fish, and why now? Much of the attention given to the toxicological effects of mercury comes from relatively recent studies and events, sparked by two well-documented incidents in the 1950's of severe mercury toxicity from eating fish heavily contaminated by industrial discharges in Japan. Methyl mercury, the more toxic form of mercury, can cross the blood-brain barrier in people, as well as the placenta, and may result in impacts to the nervous system at relatively low levels. The effects of acute mercury toxicity in the incidents in Japan (Minamata syndrome) were readily observed, but the developmental effects of lower mercury levels on prenatal and early childhood development were not evaluated until more recently, as the tests for these effects measure primarily behavioral and cognitive skills. Even after decades of study, the level of methyl mercury needed to produce measurable and lasting results following exposure during early development remains a contentious issue.

In March, 2004, the US Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) issued a joint advisory on seafood consumption and mercury (<http://www.cfsan.fda.gov/~dms/admehg3.html>). Although the two agencies differ in their respective 'limits' for mercury content in fish (FDA action limit 1.0 ppm vs. EPA advisory limit 0.3 ppm), the joint advisory makes specific recommendations on seafood consumption for a high-risk group: pregnant women, women who may become pregnant, nursing mothers, and young children. People in this group are advised not to consume shark, swordfish, king mackerel or tilefish, and should limit consumption of albacore (white) tuna to 6 ounces per week. According to FDA data, average mercury levels in these fish range from 0.73 to 1.45 ppm. The 'no-effect' estimate of allowable mercury consumption suggested by EPA for people in the high-risk group defined above is 0.1 micrograms per kilogram of body weight per day. For example, a 140 pound female of child-bearing age should be able to consume about 6.4 micrograms of methyl mercury per day or 44.8 micrograms weekly with little or no risk.

The FDA and EPA also advise that pregnant women, women who may become pregnant, nursing mothers and young children should eat up to 12 ounces per week of seafood low in mercury to obtain the health benefits from seafood consumption. An important part of a healthy diet, seafood provides a high quality protein source that is low in saturated fats, contributes to a healthy heart and is necessary for the proper growth and development of children. Farmed rainbow trout is an excellent choice to fulfill this recommendation, previously shown to be free of contaminants and pesticides while providing a healthy level of highly unsaturated fatty acids. In 2005, scientists from North Carolina State University, the University of Idaho, and Environmental Quality Institute (EQI) of UNC-Asheville embarked on a project to determine whether cultured trout produced in the US offer a seafood choice consistently low in mercury.

Sixty-five market-ready rainbow trout (mean weight 553 grams; range 219 to 1246 grams) averaging 16 months of age (range 11 to 34 months) were sampled from 13 farms in Idaho, North Carolina, Pennsylvania and Michigan. The trout industry in these states represents 37% of the commercial farms and 84% of the commercial trout production in the US. Samples were collected from the farms and handled using US EPA guidelines for assessing chemical contaminant data for use in fish advisories. Trout were filleted and subsamples of the edible meat portion were taken for analysis of total mercury content using EPA Method 234.6, cold

vapor atomic absorption spectrometry. The reporting limit for mercury using this method is 0.05 micrograms per gram (0.050 ppm) of tissue tested. All trout sampled had total mercury content below this level, with an average of 0.014 ppm and a standard deviation of 0.007 ppm. (These values are considered approximate as they are detectable but below the reporting limit.) Over 75% of the samples had mercury content of 0.01 ppm or below, and all samples contained under 0.04 ppm total mercury.

Using the 'no-effect' limit for mercury intake of 0.1 micrograms per kilogram body weight per day and the average mercury content of trout determined in this study, a 140 pound woman in the high-risk group described above could eat nearly a pound of farmed trout every day and still not exceed the no-effect consumption level of mercury! I guess the rest of us could eat all we want!!