

## ESTROGENIC ACTIVITY OF PERFLUOROALKYL ACIDS IN JUVENILE RAINBOW TROUT (*ONCORHYNCHUS MYKISS*)

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The potential estrogenic activity of perfluoroalkyl acids (PFAAs) was determined using separate screening and dose response studies with juvenile rainbow trout (*Oncorhynchus mykiss*). In the screening study, dietary exposure to 10 PFAA compounds (perfluoro -hexanoic [PFHxA], -heptanoic [PFHpA], -octanoic [PFOA], -nonanoic [PFNA], -decanoic [PFDA], -undecanoic [PFUnDA], -dodecanoic [PFDoDA], -tridecanoic [PFTrDA] acids, perfluorooctane sulfonate [PFOS] and perfluorodecane sulfonate [PFDS]) at 250 ppm or a mixture of 250 ppm each of PFOA, PFNA, PFDA and PFUnDA was performed. The dose response study was conducted with PFDA or PFOS at dietary levels of 3.2, 16, 80, 400 and 2000 ppm. A treatment of 5 ppm estradiol (E2) and solvent control treatments were conducted simultaneously with each 14 day study. Expression of plasma proteins was examined using high-throughput matrix assisted laser desorption and ionization time-of flight mass spectrometry. Protein masses from E2-treated and unexposed control fish were analyzed and estrogen-responsive protein expression models developed for each study using partial least squares (PLS) discriminate analysis. Analysis of the screening data set indicated 100% of the mixture treatment samples as estrogenic while PFNA was the only PFAA classified as estrogenic. For the dose response study, 100% of the samples from the 400 and 2000 ppm PFDA treatments and 100% of the 2000 ppm PFOA treatment samples were classified as expressing an estrogenic response profile. The remaining samples were classified as non-estrogenic. Results of this study indicate that some PFAAs may act as estrogens in fish.