

Guidelines/Criteria	
Reference:	Villeneuve DC, Valli VE, Norstrom RJ, Freeman H, Sanglang GB, Ritter L, Becking GC. 1981. Toxicological response of rats fed Lake Ontario or Pacific Coho salmon for 28 days. J Environ Sci Health B16(6):649-689.
<b>In vivo Study Type</b> Route of Administration Species & age of animals	28 day dietary study Diet Male and female Sprague-Dawley rats which were 60-70g one week before the study
<b>Study Duration</b>	28 days
<b>Type of Mixture</b> Binary >2 components  Similar acting or dissimilar What Mode of Action was investigated?	No Adult coho salmon from either Lake Ontario (Credit River) or the Pacific in 1977 were incorporated into a pelleted rat diet.  Both Nothing specific
<b>Parameters/End points Measured</b> Target organs/Critical effects  Pharmacological changes or adverse effects	Body weight and food consumption, organ weights, haematology, hormonal analyses in testis, ovary and adrenals, gross pathology and histopathology in brain, liver, spleen, kidney & heart Mainly adaptive rather than adverse, but debatable.
<b>Individual Components</b> Characterisation of individual compounds  Name, exact chemical name, CAS no. Were dose responses established for individual components? Were no effect levels established? Were doses below the NO(A)ELs investigated?	Organochlorines and metals were measured in the diets, but other contaminants will also have been present. N/A No No N/A
<b>Mixtures Investigated</b> Number of dose levels How does the mixture make-up compare to individual components? (e.g. low dose) equivalents used?) No. of technical replicates per exposure condition ( <i>in vitro</i> ) No. of animals per dose group ( <i>in vivo</i> )	Three Fish was incorporated into the diet at 1.45%, 2.9% and 5.8% by weight  10 of each sex for each fish source and dose level
<b>Observations/Findings</b>	All treatment-related effects were mild. Incorporating fish into the rat diet has effects even in absence of contaminants, making it hard to ascribe effects to the fish diet or to the contaminants. Rather than rejecting the study, the Pacific salmon (less contaminated) can be considered as the control, and the Lake Ontario salmon as the treated.  Interpreting the findings in this way, there was an increase in serum potassium at all doses for males and at the top two doses in females. There was altered steroid hormone metabolism in the adrenals of females at all doses. Sporadic mild thyroid changes in females, not clearly treatment-related. Mild dose-dependant histological changes in liver for Lake Ontario salmon, with a clear effect for mid- and high-dose males and high-dose females.
<b>Overall opinion</b> (e.g. sufficient numbers of groups investigated, group sizes adequate, observations reproducible, low dose levels used investigated)	The serum potassium changes cannot be considered adverse <i>per se</i> , and the thyroid changes are not convincingly treatment-related. The changes in hormone metabolism in female adrenals seem treatment-related but are hard to interpret as they are based on tlc work, and there was no corresponding histopathology. The mild liver effects are treatment and dose-related, but unclear if there were adaptive or adverse.