

Leatherland and Sonstegard, 1982

Guidelines/Criteria	
	Reference: Leatherland JF, Sonstegard RA. 1982. Thyroid responses in rats fed diets formulated with Great Lakes coho salmon. Bull Environ Contam Toxicol 29:341-346.
In vivo Study Type Route of Administration Species & age of animals	90 day feeding study focussed only on the thyroid Diet Sprague Dawley rats (age/weight not stated)
Study Duration	90 days
Type of Mixture Binary >2 components Similar acting or dissimilar What Mode of Action was investigated?	No Coho salmon from the Great Lakes or ocean coho salmon (used as the control) were included in the diet. Both Goitrogenicity in general
Parameters/End points Measured Target organs/Critical effects Pharmacological changes or adverse effects	T3 & T4 measurements, thyroid weight and thyroid epithelial cell height measurement Depends on magnitude of effects
Individual Components 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?	None N/A No No N/A
Mixtures Investigated 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>)	One The diet included 61% coho salmon. Different groups were fed salmon from the Pacific (control), Lake Ontario, Lake Michigan or Lake Erie. 6 male and 6 female
Observations/Findings	The males fed Great Lakes salmon had increased thyroid weight compared to those fed Pacific salmon, though when corrected for body weight this was only significant for the Lake Michigan group. No effect on thyroid weight in females. Thyroid epithelial cell height was increased only for those females fed Lake Ontario and Lake Michigan fish, and those males fed Lake Erie fish, compared to same sex groups fed Pacific salmon. The only effect seen on T3 and T4 was decrease in T4, T3 uptake and free T4 in females fed Lake Ontario salmon.
Overall opinion (e.g. sufficient numbers of groups investigated, group sizes adequate, observations reproducible, low dose levels used investigated)	When so few variables are measured it makes it hard to put the results into context of the overall state of health of the rats. For example it is mentioned in passing that the rats' livers were enlarged. Effects on the thyroid are seen, though there are much reduced in magnitude and less consistently seen than the author's earlier work where rats were fed only salmon (Sonstegard & Leatherland, 1979). The explanation is not clear, though the authors speculate organochlorine and possibly metal contaminants.