

**Leatherland and Sonstegard, 1980**

Guidelines/Criteria		
	Reference: Leatherland JF, Sonstegard RA. 1980. Structure of thyroid and adrenal glands in rats fed diets of Great Lakes coho salmon ( <i>Oncorhynchus kisutch</i> ). Environ Res 208:170-177.	
<b>In vivo Study Type</b> Route of Administration Species & age of animals	Feeding study focussed on the thyroid Diet Sprague Dawley rats newly weaned, male	Feeding study focussed on the thyroid Diet Sprague Dawley rats newly weaned, male
<b>Study Duration</b>	4 and 8 weeks	4 weeks
<b>Type of Mixture</b> 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 Thyroid effects in general	No Coho salmon from the Great Lakes or ocean coho salmon (used as the control) were included in the diet. Both Thyroid and adrenal effects in general
<b>Parameters/End points Measured</b> Target organs/Critical effects  Pharmacological changes or adverse effects	Thyroid epithelial cell height measurement, histopathology and electron microscopy Depends on magnitude of effects	Thyroid and adrenal weights, histopathology and electron microscopy Depends on magnitude of effects
<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?	None N/A No No N/A	None 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> )	One The diet consisted of coho salmon. Different groups were fed salmon from the Pacific (control), Lake Ontario, Lake Michigan or Lake Erie.  5 male and 5 female	One The diet consisted of coho salmon. Different groups were fed salmon from the Pacific (control), Lake Ontario (with and without iodine supplementation), Lake Michigan or Lake Erie.  5 male and 5 female
<b>Observations/Findings</b>	Thyroid epithelial cell height was increased in rats fed Lake Ontario fish (and reduced in rats fed Lake Erie fish at the 4 week time point only), compared to groups fed Pacific salmon. Changes were seen in cells from thyroids of rats fed Lake Ontario and Lake Michigan fish, but not those fed Lake Erie fish.	The rats fed Great Lakes salmon had increased relative thyroid weight compared to those fed Pacific salmon. Only the rats fed Lake Erie or Lake Michigan salmon had increased relative adrenal weight compared to those fed Pacific salmon. Swollen sinusoidal complexes in adrenals of rats fed Lake Ontario salmon.
<b>Overall opinion</b> (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. Effects on the thyroid are seen.	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. Effects on the thyroid and adrenals are seen.