

Sonstegard and Leatherland, 1979

Guidelines/Criteria	
Reference:	Sonstegard RA, Leatherland JF. 1979. Hypothyroidism in rats fed Great Lakes coho salmon. Bull Environ Contam Toxicol 22:779-784.
In vivo Study Type Route of Administration Species & age of animals	1-2 month feeding study focussed only on the thyroid Diet Male 30 day old Wistar rats
Study Duration	2 months
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 fed as the diet. Both Goitrogenicity in general
Parameters/End points Measured Target organs/Critical effects Pharmacological changes or adverse effects	T3 & T4 measurements 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 was only coho salmon, fed at 30g per 100g of rat body weight. Different groups were fed salmon from the Pacific (control), Lake Ontario, Lake Michigan or Lake Erie. 5 terminated at 1 month and another 5 at 2 months
Observations/Findings	The groups fed Great Lakes salmon had lower serum T4 concentrations, T4/T3 ratios and in some cases greater epithelial cell height than those fed Pacific salmon.
Overall opinion (e.g. sufficient numbers of groups investigated, group sizes adequate, observations reproducible, low dose levels used investigated)	Regarding all three experiments: 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. Hypothyroidism is seen, with thyroid hyperplasia and hypertrophy. Despite concerns that an all-salmon diet might be unhealthy for rats, those fed Pacific salmon in the first experiment showed the same results as rats fed normal rat chow. The explanation is not clear, though the authors speculate about synergistic interactions between organochlorine contaminants.

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1 month feeding study focussed only on the thyroid	1 month feeding study focussed only on the thyroid
Newly weaned male Wistar rats	Newly weaned male Wistar rats
1 month	2 month
No Coho salmon from the Great Lakes or ocean coho salmon (used as the control) were fed as the diet. Both Goitrogenicity in general	No Coho salmon from the Great Lakes or ocean coho salmon (used as the control) were fed as the diet. Both Goitrogenicity in general
T3 & T4 measurements	Thyroid weight
Depends on magnitude of effects	Depends on magnitude of effects
None N/A No No N/A	None N/A No No N/A
One The diet was only coho salmon, fed at 40g per 100g of rat body weight. Different groups were fed salmon from the Pacific (control), Lake Ontario, of fish from Lake Ontario with the addition of an iodine supplement.	One The diet was only coho salmon, fed at 40g per 100g of rat body weight. Different groups were fed salmon from the Pacific (control), Lake Ontario or Lake Michigan.
5	5
The groups fed Great Lakes salmon had lower serum T4 concentrations and T4/T3 ratios than those fed Pacific salmon.	The groups fed Great Lakes salmon had increased thyroid weight compared to those fed Pacific salmon.