

Mercury Levels in Steller Sea Lion Pups in Alaska

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Exposure to mercury of Steller sea lions (SSL) was assessed by measuring total mercury (THg) in hair and THg and methyl mercury (MeHg) in liver. Livers were obtained from necropsies of SSL pups found dead on rookeries.

THg in hair varied significantly by region and age. Young pups had the highest and most variable levels with lowest mean values occurring in hair from pups in the southeastern (SEA) population (mean \pm S.D., 4.0 ± 1.6 $\mu\text{g/g}$). THg in hair from month old pups from Amak and Sugarloaf Islands averaged 7.7 ± 2.7 $\mu\text{g/g}$ and 8.2 ± 3.8 $\mu\text{g/g}$, respectively. Hair from 3 month old pups from Prince William Sound (PWS) had the highest and most variable THg (9.1 ± 6.3 $\mu\text{g/g}$). 25-40% of young pups from the western populations had THg higher than 10 $\mu\text{g/g}$, a level which the EPA suggests may indicate exposure sufficient to produce toxic effects.

Older pups, young of the year (YoY) and yearlings had significantly lower THg in hair but regional differences were still apparent in YoY. In this case, hair from pups from SEA and PWS had the lowest THg (1.6 ± 0.6 $\mu\text{g/g}$ and 1.1 ± 0.3 $\mu\text{g/g}$, respectively) while values from pups captured around Kodiak and in the Aleutians were slightly higher (2.7 ± 0.9 $\mu\text{g/g}$ and 2.3 ± 1.0 $\mu\text{g/g}$, respectively). This represents lactationally derived hair.

There was no apparent difference in THg between the livers of month old Steller sea lion pups from SEA (0.80 ± 0.49 $\mu\text{g/g}$) and PWS (0.84 ± 0.29 $\mu\text{g/g}$). THg and MeHg were within ranges reported for other marine mammal pups. Consistent with previous marine mammal studies, the proportion of THg that was in the MeHg form was relatively high (53 ± 6 %). A single fetal sample had a very high proportion of MeHg (75%), although both THg (0.41 $\mu\text{g/g}$) and MeHg (0.31 $\mu\text{g/g}$) were relatively low.

Hair is likely an efficient post-parturient excretory mechanism for newborn pups exposed to Hg in utero. This matrix offers important insights for exposure of the fetus, a well recognized life stage of concern for Hg toxicosis.