

Stable Isotope Comparisons of Alaska Steller Sea Lion (*Eumetopias jubatus*) Populations Using Milk, Serum, and Vibrissae

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The potential to identify weaning of Steller sea lions (SSLs) utilizing stable isotope signatures first requires that distinct isotopic signatures exist between nursing pups and pups that ingest live prey. This study measured stable-carbon ($\delta^{13}\text{C}$) and -nitrogen ($\delta^{15}\text{N}$) isotope ratios in pup serum (n=20) and vibrissae roots (n=20) relative to isotope ratios found in ingested milk (n=29). Isotopic signatures from free-ranging SSL pups (1-11 months) and yearlings (14-22 months) captured in the eastern (southeast Alaska) and western (Prince William Sound and western Aleutians) stocks were compared to determine if early weaning was evident. Stable isotope values should change with diet such that milk represents a higher trophic level diet (as a 'tissue' produced by mom) than forage fish. Mean milk $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values were similar between populations, although only the eastern population showed a change in the milk signature with age of the pup (p=0.001 and p=0.005, respectively). In contrast, vibrissae root $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values changed with pup age in both populations (p<0.02) suggesting that western pups may also ingest prey within the first year since ingested milk signatures did not change in this population. Mean vibrissae root $\delta^{15}\text{N}$ values did not differ from serum in either the eastern (17.6 ± 0.6 and 17.2 ± 0.8 , respectively) or western (17.2 ± 1.9 and 17.2 ± 1.8 , respectively) populations (p=0.590), although age related changes for this relationship will require larger sample sizes to evaluate statistically. Eastern and western SSL pup mean vibrissae root $\delta^{15}\text{N}$ values (17.8 ± 0.8 and 18.7 ± 1.4 , respectively) were a trophic level higher than that of milk

(15.2 ± 1.1 and 15.8 ± 1.1 , respectively) as expected for a nursing signature.



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