

(5) University of Hawai'i at Manoa, 1955 East-West Road, Honolulu, Hawaii, 96822, USA

Corresponding author: shannon.atkinson@alaska.edu

Of the hypotheses put forward to explain the decline in abundance of the western stock of Steller sea lions (SSL, *Eumetopias jubatus*), the nutritional stress hypothesis has been the most difficult to test. Nutritional stress implies that either the quality (as possibly occurs when primarily low fat content prey are consumed) or quantity (as occurs during fasting) of prey that is available or consumed is insufficient to maintain the health and fitness of the predator. Using feeding studies with captive animals, digestive capacity and physiology were studied when SSL consumed presumed low-quality prey, or were fasted. Juvenile SSL (n = 7) were temporarily held in a captive setting and fed a 100% pollock diet, in both fall (n = 3) and spring (n = 4) for a range of 29 – 49 days. All animals experienced rapid growth, or approximately 25% of their body mass over the duration of the feeding trial. In addition, body fat increased significantly ($9.0 \pm 3.2\%$) between capture and the end of the feeding trials. Daily intake of pollock ranged from 7.6 to 10.9% of the SSL's body mass. Proximate composition of the pollock revealed variability among batches; however, this had no impact on sea lion growth rates. In a second study, subadult SSL (n = 9) were fasted for up to 2 weeks or 15% body mass loss, and then fed. Thyroid function indicated the SSL lowered their metabolism during the fast and then increased it upon feeding. Our results suggest that pollock is an adequate primary prey item for SSL (i.e., not junk food), and SSL can clearly alter their metabolism to accommodate for short-term lack of food. Understanding the feeding ecology and physiology is crucial for management and recovery of species, especially those listed as endangered.

Nutritional Stress: Steller sea lion response to diet and fasting

Atkinson, Shannon¹; Calkins, Donald²; Mellish, Jo-Ann^{3,1}; Waite, Jason N.¹; Rea, Lorrie⁴; Carpenter, James R.⁵; Mashburn, Kendall¹

(1) UAF/SFOS Fisheries Division, University of Alaska Fairbanks, Juneau, Alaska, 99801, USA

(2) North Pacific Wildlife Consulting LLC, 12600 Elmore Road, Anchorage, Alaska, 99516, USA

(3) Alaska SeaLife Center, 301 Railway Ave., Seward, Alaska, 99664, USA

(4) Alaska Department of Fish and Game, 333 Raspberry Road, Anchorage, Alaska, 99518, USA

ABSTRACTS

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