

*Session SSL-11: Steller Sea Lion Biology and Ecology  
Feeding and Diving Ontogeny*

**Steller sea lion foraging ecology is an important factor in juvenile survival**

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The survival of juvenile Steller sea lions is likely strongly influenced by their post-weaning foraging success. Several factors influence the diving and foraging ability of marine mammals: increased oxygen stores prolong aerobic metabolism, increased oxidative enzyme concentrations provide for more efficient use of fuels, and decreased metabolism slows rate of fuel consumption. However, in young animals, foraging ability may be physiologically limited due to low total body oxygen stores and a high mass specific metabolic rate.

To examine the development of diving physiology in Steller sea lions we monitored changes in blood oxygen stores, muscle oxygen stores, and muscle enzyme concentrations. Blood oxygen stores were determined by measuring hematocrit (Hct), hemoglobin (Hb), and red blood cell counts (RBC), while muscle oxygen stores were determined by measuring myoglobin concentration and muscle mass. Lactate Dehydrogenase (LDH), Citrate Synthase, and b-Hydroxyacyl Dehydrogenase (HOAD) concentrations were assayed to investigate the anaerobic versus aerobic enzyme profiles of muscle. Hct, Hb, RBC, and Mb values indicate that nursing animals have decreased oxygen storage capacity in comparison to adults. Muscle myoglobin loads in 1-month-old pups are significantly lower than that of adults ( $p < 0.001$ ). Additionally pups show no variation in concentration of Mb, HOAD, CS and LDH between swimming and non-swimming muscles ( $p > 0.05$ ) whereas adults show significant elevation in swimming muscles. These findings suggest that the physiology of young Steller sea lions is immature and may constrain dive behavior. The developmental hypothesis will be further explored with the analysis of fiber type composition. Research supported through a grant provided by CIFAR (NA17RJ1224) and with a co-operative agreement through NOAA and ADF&G (NA17FX1079).

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## Abstracts



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