

Impact of Health and Maternal Investment on Survival of Endangered Steller Sea Lion Pups

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Several species of marine mammals and birds in the Northeast Pacific have been in decline since the mid-1970 s including the endangered Steller sea lion (SSL; *Eumetopias jubatus*). A leading theory is the nutritional stress associated with a reduction in prey abundance or quality. The impact of limited resources would be greatest during periods of development and rapid growth. The overall goal of this project is to determine if changes in maternal investment, body condition, and circulating hormone levels results in measurable changes in the health and survival of SSL pups, as measured through the immune system.

At Chiswell Island, Alaska, a SSL rookery was monitored by remote video cameras enabling the determination of the age of pups, maternal investment, and survival rates. A total of 61 pups (24 female, 37 male) were sampled during 2005, 2007, and 2008 ranging in age from 5 to 38 days old. Each pup was measured, weighed, and branded. Blood samples were collected for complete blood cell counts, lymphocyte proliferation, serum chemistries and circulating hormone levels.

Female pups were significantly smaller than males in mass ($F=26.7 \pm 4.1$ kg, $M=32.2 \pm 4.6$ kg; $F=16.276$, $p<0.001$) and length ($F=101.6 \pm 4.7$ cm, $M=108.0 \pm 4.9$; $F=17.331$, $p<0.001$). Age also significantly affected mass ($F=49.802$, $p<0.001$) and length ($F=17.331$, $p<0.001$) with older pups being larger. While there was a significant difference between male and female pups in body condition these differences were not found in circulating hormones or lymphocyte proliferation. Circulating TT4 ($F=6.007$, $p<0.017$), FT4 ($F=6.405$, $p<0.014$), and T cell proliferation ($F=4.984$, $p<0.038$) decreased while leptin ($F=5.679$, $p<0.020$) increased with age. Further analysis will explore the use of two indices (body condition and maternal investment) in an effort to increase the fit of the models.

Student Presentation