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2017. Thometz, N., Rosen, D., and Reichmuth, C. Patterns of energy intake and metabolism in spotted seals (*Phoca largha*) provide insight into physiologically sensitive life-stages. Alaska Marine Science Symposium, Anchorage, Alaska, United States, 23 January – 27 January. (Poster abstract).

Patterns of energy intake and metabolism in spotted seals (*Phoca largha*) provide insight into physiologically sensitive life-stages

Forecasting the potential impact of environmental change on ice-associated seals requires identifying critical nutritional and physiological periods. To provide fine-scale information about ontogenetic and seasonal changes in growth and caloric requirements, we evaluated two captive male spotted seals (*Phoca largha*) at the University of California Santa Cruz over a six-year period extending from early development through sexual maturity. Daily caloric intake was determined for each seal and referenced to developmental stage (age), physiological condition (body mass and length, reproductive maturity, molting status), and corresponding environmental features (air and water temperatures, photoperiod). In addition, we conducted a complimentary metabolic study with the same two spotted seals as adults at the Alaska SeaLife Center; data collection extended across molting, reproductive, non-molting, and non-reproductive periods when the seals were six years old. Data from both studies were combined and analyzed to reveal short- and long-term patterns of energy intake, growth, body condition, and metabolism for this species. The seals displayed highly predictable developmental and seasonal patterns in food intake and body mass, comparable to other temperate and polar seals. Annual peaks in food consumption occurred during the annual spring molt and remained elevated during the post-molt period. Voluntary hypophagia occurred in the winter, although this decline was notably absent in a year with abnormally warm water temperatures. Seasonal cycles in food intake became more acute with age, largely due to more extreme winter hypophagia. Our data suggest that seasonal fluctuations in spotted seal prey resource requirements are strongly influenced by both physiological cycles and environmental conditions. Although the absolute amount of prey needed by captive individuals is presumably less than for wild conspecifics, the relative developmental and seasonal patterns in energy intake and metabolism described in this study are essential to understanding dynamic prey requirements of wild spotted seals.