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**Molting status differentially affects resting metabolism of Alaskan seals in air and water**

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Seals rely on thick blubber stores and regulation of peripheral blood flow to maintain thermal homeostasis and limit energetic costs. During the annual molt, seals rest out of water for extended periods to increase blood flow to the skin—providing essential nutrients and optimal temperatures for tissue regeneration—while limiting heat loss to the environment. It is unclear how Arctic seals will respond to ongoing sea ice loss and a reduction in available haul-out substrate. Seals may be forced to move with retreating sea ice, travel to terrestrial haul-outs, and/or spend increasing amounts of time in water. All of these scenarios will likely have negative energetic consequences, which may be exacerbated during the molting season. Here, we evaluate the energetic costs incurred by ice-dependent seals in air and in water, as a function of their molting status. If seals possess volitional control of heat loss via skin perfusion during molt, then metabolic costs of resting in water should be similar to costs incurred when resting in air. Alternatively, if seals have a reduced ability to regulate blood flow to the periphery during molt, then resting metabolism in water should be higher than in air. We used open-flow respirometry to measure the resting metabolic rate (RMR) of three spotted seals (*Phoca largha*) and one ringed seal (*Pusa hispida*) at the Alaska SeaLife Center. Measurements were obtained in air and in water prior to, during, and following the molting period. Resting metabolism was similar in the two mediums, with slightly higher RMR typically observed in water. However, during peak and late molting periods, RMR was notably higher in the haul-out condition compared to corresponding measurements in water. These data indicate that seals have some level of control over their peripheral blood supply and heat loss, irrespective of molting status. An improved understanding of thermoregulation in Alaskan seals as well as implications of increased time in water during molt will be required as preferred haul-out substrates continue to retreat.