

## ***Antler Size Relative to Body Mass in Moose: Tradeoffs Associated with Reproduction***


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Body size and age are highly correlated with antler size, fighting ability, and reproductive success in male cervids. Production of antlers requires energy above that for maintenance of basal functions, and is especially demanding of minerals; young animals have the additional cost of completing body growth. Large-bodied males with large antlers invest more in antler development and reproduction at the expense of body condition than do young males. Young males are constrained by the need to complete body growth to attain the body size needed to compete effectively for females when mature and, hence, invest less in antlers. We tested the hypothesis that adult male moose (*Alces alces*) produced larger antlers relative to their body mass than did younger males. We used regression to compare the ratio of antler length per unit body mass (antler length:body mass) with age. Regression analysis indicated a strong curvilinear relationship ( $R^2_a = 0.961$ ) between antler length per unit body mass and age. Young males invested less in antlers than older males that had reached a sufficient size to compete effectively for mates; consequently, there was a tradeoff between body growth and antler size. Young males must produce antlers to gain experience in aggressive encounters and establish dominance relationships among their cohort, although investment in antlers is less than that of mature adults. Delaying investment in mating until physically mature and able to compete for females with other large-antlered males is the most successful strategy for maximizing reproductive success and achieving the greatest fitness in male moose as well as among other cervids.



Program and Abstracts

**50th Arctic Science Conference**  
*Science in the North: 50 Years of Change*

Denali National Park and Preserve, Alaska • September 19–22, 1999