(15) EVALUATING PROTEIN BALANCE IN WINTERING MOOSE

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Abstract: Moose contend with declining supplies of energy and protein as the concentrations of plant toxins and fiber increase in browse. Body stores are used to meet demands for energy and protein when dietary supplies are insufficient for normal activities and reproduction. Measures of rump fat thickness are used to assess seasonal dynamics in body energy reserves but a similar indicator of body protein use has not been demonstrated. We used the stable isotope of nitrogen (∂15N) to distinguish between protein in the diet and the body of female moose (n = 6) over 3 winters. Body mass and rump fat thickness declined following rut in October through parturition in late May. Serum concentrations of urea were low in winter but increased in spring when green leaves emerged, which indicated that N oxidation was minimized when dietary protein was low. Body protein was used through winter when 76 ± 5 % of N in urea was derived from body protein whereas only 8 ± 12 % of urea-N was derived from the body in spring. Plant toxins may exacerbate N losses in moose during winter because more urinary N was lost as ammonia than as urea, especially as the concentration of phenols increased in urine. Moose recycled body proteins during winter because ∂15N values of serum proteins were 1.14 ± 0.62 ppt greater than those of red blood cells. Metabolites of N in urine and blood can be combined with rump fat thickness and calf mass to evaluate the effect of habitat on production of moose.

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