

**CAMERON**

**COMPARATIVE BODY WEIGHTS OF PREGNANT/LACTATING AND NON-PREGNANT FEMALE CARIBOU**

Raymond D. Cameron, Alaska Department of Fish and Game, 1300 College Road, Fairbanks, AK 99701

Walter T. Smith, Alaska Department of Fish and Game, 1300 College Road, Fairbanks, AK 99701

Steven G. Fancy, U.S. Fish and Wildlife Service, 101 12th Avenue, Box 20, Fairbanks, AK 99701

Abstract: In October 1987, July 1988, October 1988, and July 1989, 18 radio-collared adult (>3-year-old) female caribou (Rangifer tarandus granti) of the Central Arctic Herd were immobilized and weighed 2-4 times each. All females were relocated by fixed-wing aircraft during June and July 1988 and 1989, and reproductive status was determined on the basis of calf presence and/or antler retention. Between October 1987 and July 1988, pregnant and non-pregnant females, on average, lost 41 and 40 g/d, respectively, whereas comparable weight losses in 1988-89 were 65 and 35 g/d, respectively. Between July and October 1988, respective rates of weight gain for lactating and non-lactating females were 126 and 173 g/d. We suggest that compensatory feeding by pregnant and lactating female caribou can and does occur. However, the extent to which these additional metabolic demands are met apparently varies with changes in the environmental conditions that influence forage intake.

In late September/October 1986-88, 29 radio-collared adult (>3-year-old) female caribou (Rangifer tarandus granti) from the Central Arctic Herd (CAH) and Porcupine Herd (PCH) were darted 1-3 times from a helicopter, weighed to the nearest kilogram, and released. In late September/October 1987-89 and in early July 1988-89, 23 radio-collared adult females from the CAH (including most of the above) were similarly immobilized and weighed 2-5 times each. All caribou were located by fixed-wing aircraft during late May/June (calving), early July, and late September/October (pre-rut) 1987-88; parturition or lactation status was determined primarily on the basis of calf presence.

Fall body weights of females that subsequently became pregnant (based on evidence of parturition in late May or June of the next year) were compared with those of females that apparently had not conceived. Where sequential body weights were obtained, weight changes of pregnant or lactating females were compared with those of reproductively inactive females for the period between capture events. Mean body weights and rates of weight change were compared using Student's t-test with 95% confidence interval.

Pregnant CAH and PCH female caribou were significantly heavier during the previous fall than non-pregnant females (Table 1), and fecundity tended to increase with body weight (Fig. 1). However, the weights of pregnant and non-pregnant females overlapped

considerably, perhaps reflecting an age-dependent effect within the 3+ year age class; for example 3- and 4-year-olds may be less likely to conceive than older females, irrespective of body weight. Nevertheless, as a single index of condition, fall body weight appears to be a useful gross predictor of reproductive performance.

Table 1. Mean (SE) fall body weights of pregnant and non-pregnant adult (>3-year-old) female caribou. Central Arctic Herd and Porcupine Herd, 1986-88.

Status	Body weight (kg)	n
Pregnant	92 (1)	31
Non-Pregnant <sup>1</sup>	86 (2)	13

<sup>1</sup> Assumed if no evidence of parturition.

Between October and July, rates of weight loss among pregnant/lactating and non-pregnant female caribou were not significantly different (Table 2), implying higher rates of forage intake and/or an increased efficiency of nutrient utilization by the former to compensate for the additional metabolic demands of gestation and early lactation. A relatively greater reduction in voluntary food intake by non-pregnant females during winter might also account, in part, for the similar rates of weight loss observed.

In contrast, between July and October, lactating females regained significantly less weight than non-lactating females (Table 2), although the difference (estimated as the amount of body fat, protein and energy) is considerably less than the theoretical cost of milk production over the period in question. This suggests compensatory feeding and/or nutrient utilization by lactating females as well.

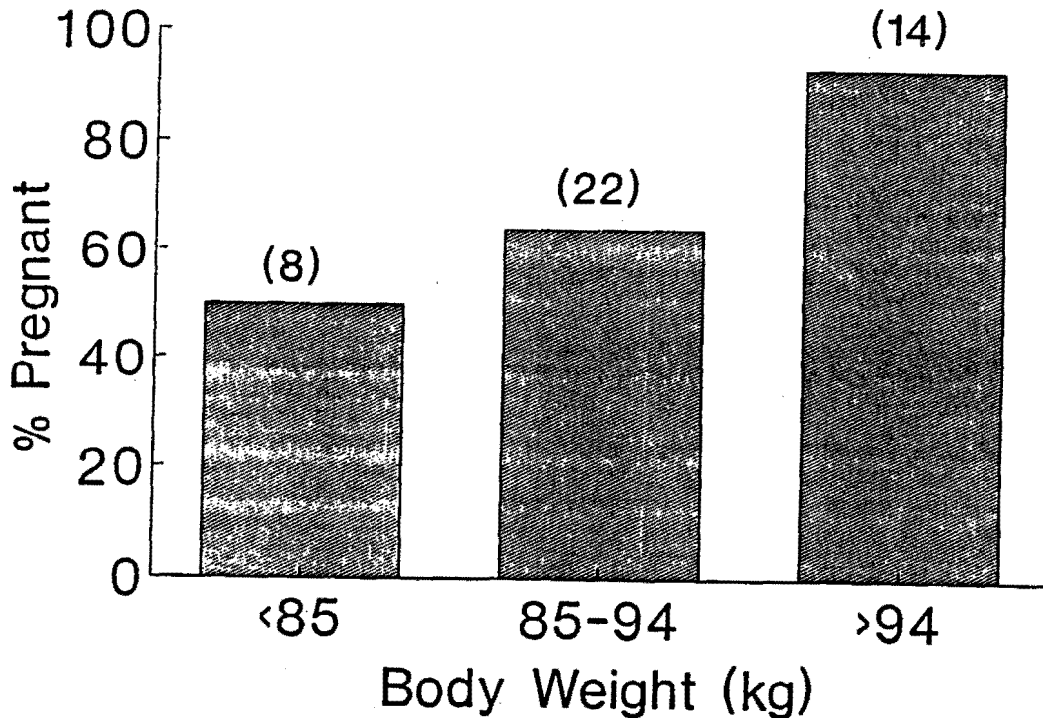


Fig. 1. Changes in pregnancy rate among adult (>3-year-old) female caribou in relation to fall body weight, Central Arctic Herd and Porcupine Herd, 1986-88.

Table 2. Changes in mean (SE) body weights of radio-collared adult (>3-year-old) female caribou based on serial (paired) determinations: effects of pregnancy and lactation. Central Arctic Herd, October 1987-October 1989.

Status	Weight (kg)				
	October	July	Change	g/day	n
Pregnant/lactating	92 (2)	78 (3)	-14 (2)	-53 (8)	11
Non-Pregnant <sup>1</sup>	89 (3)	79 (2)	-10 (1)	-40 (4)	9

Status	Weight (kg)				
	July	October	Change	g/day	n
Lactating	78 (2)	89 (3)	+11 (1)	+121 (12)	11
Non-Lactating <sup>2</sup>	81 (2)	99 (2)	+19 (1)	+200 (15)	15

<sup>2</sup> Includes females that lost calves in early July.

NOTE: As rates of change (g/day) between years for each category were not significantly different, the data were combined.

To consistently reproduce, female caribou may be required to compensate for the additional costs incurred. In doing so, they maintain a minimum standard of condition and maximize the chance of conception each fall.

Conversely, failure to compensate when adverse environmental circumstances prevail (e.g. deep snow, abundant insects) may depress body condition and, hence, the probability of conceiving.

It should be emphasized that changes in body weight are not necessarily accompanied by proportionately equal changes in the amounts of the principal body constituents (i.e., water, fat and protein); nor does weight constancy necessarily reflect stasis in body composition. Reliable in vivo techniques for estimating body composition of caribou are needed to clarify the role of condition in the reproductive process.

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