ANTLER RETENTION AND UDDER DISTENSION AS INDICATORS OF PARTURITION IN FREE-RANGING CARIBOU

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Abstract: Radio-collared females of the Porcupine Caribou Herd were observed repeatedly during calving from 1982 to 1989. Presence of 1 or more hard antlers or of a distended udder was a strong indicator of parturition. Lack of antlers or an udder was a less reliable indicator of barrenness. Some females shed antlers up to 3 weeks before parturition, while others retained antlers up to 2 weeks after birth. Most (90%) females developed large udders before parturition, and some no longer had visible udders within 2-11 days after losing their calves. Accuracy of either method for estimating population parturition rates depends greatly on timing of surveys relative to peak of calving. Also, antler and udder condition of pregnant, parturient, and barren cows, as well as cows which lost calves, overlapped. Problems with using either technique to assess parturition rates or early calf mortality are discussed.

Radio-collared females of the Porcupine Caribou (Rangifer tarandus granti) Herd were observed repeatedly during calving from 1982 to 1989. Determining which females were parturient was not always easy, even when they were individually marked and observed repeatedly throughout the calving period. Determining which females were barren was even more difficult. Some females shed antlers up to 3 weeks

before parturition, while others retained antlers up to 2 weeks after birth. Most (>90%) females developed large udders before parturition, and some no longer had visible udders within 2 to 11 days after losing their calves. In an experiment in which calves were taken away from 9 cows early in the calving season, 3 showed no signs of having been parturient 10-11 days later (i.e., they had neither hard antlers nor distended udders). The remainder had antler and udder characteristics similar to other collared cows that had lost calves, but also similar to cows which were still pregnant (Table 1).

	Udder distension		
Antlers	None	Small	Large
0	3[1]	2	0
1	1	0	0
2	1	0	2

[1] Number of Caribou.

Retention of hard antlers into the calving period was a strong indicator of pregnancy. All but 2 of 197 females with 1 or more hard antlers at the beginning of the calving period were eventually observed with calves and/or distended udders. That lack of antlers denotes barrenness was much less certain.

Polled females, broken antlers, and early shedding in pregnant females all can lead to errors. Growth of new velvet antlers during the early calving period was strongly correlated with barrenness, but exceptions were noted among unmarked cows.

Udder distension during the calving period was probably an even more certain indicator of parturition. As with lack of antlers, however, lack of an udder did not always indicate barrenness. Also, at no time did all parturient cows have udders simultaneously.

Perhaps the best field estimate of parturition rate would be a survey conducted at the end of the peak calving period combining observations of calves at heel, antlers, and distended udders. Many, if not most, cows would have calves at heel. Few would have lost calves early enough that they would not still have udders or antlers, and those cows still pregnant would have antlers or udders. Although such an estimate would not be entirely free of errors (Table 1), it would be better than any of the techniques applied alone.

Comparison of udder counts with counts of calves at heel to determine early calf mortality must be approached very cautiously. It is definitely not true that a female with a large udder but no calf has usually lost its calf (Bergerud 1964). In fact, nearly every pregnant cow has a large udder before her calf is born. Such mortality estimates have a built-in bias overestimating mortality up until the last calf is born. By then, bias toward underestimating

mortality would accumulate as cows lost calves and their udders regressed. Although these errors would compensate to some extent, one would seldom if ever know how much.

Even if antlers or udders were positive indicators of parturition (which they are not), obtaining population estimates would still be difficult. In addition to timing problems, distribution of parturient versus barren females may make it very difficult to obtain a representative sample of a population. Over 20 years ago, Skoog (1968) considered the utility of antler counts and the then new distended udder technique: "As an indicator of natality, the percentages obtained are reasonably close to the expected results. Nevertheless, the variables present in the use of this method preclude its resulting in much more than approximations." Unfortunately, the same is still true today. Benefits of refining estimates based on the presumed infallibility of udder counts are often illusory at best.

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