

## Dissertation



**Laura Christine Cuyler** successfully defended her doctoral thesis *Temperature regulation and survival in Svalbard reindeer* at the University of Oslo, Norway, on the 30th of January, 1993. Christine Cuyler was born in Vancouver, B. C., Canada. She attained her B.Sc. degree at the University of Guelph, Ontario and her Cand. scient. degree at the University of Oslo.

*Abstract:* As a herbivore, Svalbard reindeer exhibit particular hardiness in the face of prolonged, dark, cold winters and are a good example of effective adaptation for heat exchange in a cold environment. The principal survival strategies of Svalbard reindeer include: metabolic economy through low metabolic heat product-

ion, sedentary behaviour, including much rest in a closed curled posture, and an excellent fur insulation.

Relative to reindeer/caribou and other ungulates, heat production at rest was lower in the Svalbard reindeer studied and a slight heat storage occurred while in the lying posture. The predominance of resting in the winter activity budget of the sedentary Svalbard reindeer coupled with the low heat production associated with resting resulted in relatively low daily energy expenditure and, hence, the reindeer could stretch their energy reserves over several more weeks than would be otherwise possible, thus improving their prospects for survival. The implication is that any disturbance which causes an increased activity in winter may, by increasing energy expenditure, reduce survival.

The winter fur samples of Svalbard reindeer studied had double the insulation of caribou fur, although they were only 30% thicker. The fur layer is significant in maintaining homeothermy during exposure to wind, rain and solar radiation and may help explain the high ratio of survival of Svalbard reindeer calves in contrast to heavy mortality observed in caribou calves.

For Svalbard reindeer, the art of winter survival is supported by energy conservation behaviour and superior fur insulation.