Progesterone secretion in reindeer

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Most deer species living in their natural environment are seasonal breeders. This seasonal pattern is most obvious in those species, such as reindeer and caribou, living in cold and temperate regions. Progesterone plays an important role in the regulation of the oestrus cycle and in the maintenance of pregnancy in ruminants. Serum progesterone concentrations can be used when assessing current reproductive status in the polyoestrous female reindeer. However, there is little published information on normal values for reindeer (McEwan & Whitehead 1979, Rehbinder et al. 1981, Blom et al. 1982). We examined temporal variations in the concentrations of progesterone in the peripheral serum of semi-domesticated reindeer hinds during the breeding season, pregnancy and seasonal anoestrus.

This study was carried out at the Kaamanen Reindeer Research Station in Northern Finland (69° 10′ N).

During the breeding season blood samples were taken from 15 penned adult reindeer hinds between 8.00–10.00 and 20.00–22.00 every day from September 29 to October 20 1988. During the rutting season the oestrous activity was monitored with the aid of an adult stag fitted with a ram mating harness and crayon. The hinds were inspected twice daily for mating marks until October 20. The onset of oestrus (first paint mark on the rump of a hind) was considered to be day 0 of the cycle.

During pregnancy and anoestrus, the blood samples were collected from 12 adult reindeer hinds every two weeks from September 29 1986 to October 7 1987.

All the animals were restricted by hand and no drugs were used. Blood samples were taken by jugular venipuncture in vacutainer tubes, centrifuged and the serum fractions were stored at -20° until analyzed. Serum progesterone concentrations were measured by a radioimmunoassay kit (Farmos Diagnostica). For statistical evaluation data were analyzed by the analysis of variance and Student's t-test.

All the hinds had very low serum progesterone levels (< 0.5 ng/ml) at 20–8 days before ovulation. They showed a slight 3–4-day rise in serum plasma progesterone to 0.7 ng/ml at 8–2 days before ovulation ($p < 0.01$). This increase preceded behavioral oestrus.

The first rise above 1 ng/ml was seen 2–3 days after the estimated first ovulation. In 14 out of 15 hinds the pregnancy was verified by ultrasound and the hinds had increasing serum progesterone levels (to 3 ng/ml in 6 days).

Serum concentrations of progesterone remained high (> 5 ng/ml) in all the hinds throughout the pregnancy reaching the highest values at 40 days before calving. The progesterone values fell dramatically during the last ten days before calving to basal levels (< 0.5 ng/ml) at the start of lactation.

References

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