

**BASAL AND GNRH-INDUCED LH SECRETION IN THE RED DEER HIND:
THE EFFECTS OF OVARIECTOMY AND OESTRADIOL TREATMENT**

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The seasonal control of LH secretion in the red deer hind was studied over a 14 month period in ovariectomised (OVX, n=8), ovariectomised and oestradiol treated (OVX+E₂, n=8) and entire (n=8) adult animals. Ovariectomy took place either prior to the breeding season (22 Feb 1990, n=4 per group) or 5 years earlier during the breeding season (28 June 1985). Oestradiol-containing or empty s.c. implants (length 4 cm; ID 0.335 cm x OD 0.465 cm) were inserted on 22 Feb 1990 and the hinds subsequently blood sampled weekly for LH (heterologous ovine RIA; sensitivity 0.05 ng/ml). Entire hinds were sampled twice weekly to monitor ovarian activity (plasma progesterone) indicative of the breeding season.

In entire hinds, the breeding season consisted of 7-9 ovarian cycles and lasted from 30 March 1990 to 1 September 1990. This period was characterised by relatively high mean LH concentrations in both E₂ treated and untreated OVX hinds and was more evident (p<0.05) in the old OVX hinds (0.87 ± 0.03 ng/ml) than the new OVX animals (0.65 ± 0.03 ng/ml). Anoestrus lasted from 1 September 1990 to 2 April 1991, during which little progesterone was secreted in 6 of the animals. The remaining 2 hinds had secretion patterns indicative of a persistent corpus luteum and perhaps adrenal activity. Mean LH concentrations for hinds with E₂ implants were very low 0.13 ± 0.01 ng/ml (below detectable levels for 116 ± 22 d) throughout the non-breeding season. In comparison hinds without E₂ (mean anoestrus LH 0.45 ± 0.02 ng/ml) fell below detectable levels for only 27±8d. The LH pattern in this group of hinds closely followed the change in daily photoperiod rather than with the breeding and non-breeding season.

Four weekly challenges with exogenous GnRH (10 µg/hind, i.v.) also produced a seasonal pattern in pituitary LH response at 15 minutes post challenge (Table 1).

Table 1 GnRH-induced LH secretion.

	Mean LH ± sem (ng/ml plasma)		
	OVX+E ₂	OVX	Entire
Breeding season	15.69 ± 3.27 ^a	7.92 ± 2.19 ^b	1.26 ± 0.66 ^c
Anoestrus	3.22 ± 2.51 ^c	4.21 ± 1.89 ^c	1.34 ± 0.78 ^c
(P<0.05 for values with differing superscripts)			

As in the ewe, the breeding season is characterised by a marked change in the sensitivity of LH secretion to oestradiol⁽¹⁾. In addition, these results suggest a strong photoperiodic influence on LH secretion in the absence of oestradiol as in the hare⁽²⁾ but more marked than in the ewe⁽³⁾. The pituitary LH response to GnRH also appeared to be enhanced by ovarian feedback during the breeding season.

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