

**A DOSE-RESPONSE STUDY OF THE EFFECT OF OESTRADIOL ON LH SECRETION IN RED DEER HINDS : EFFECTS OF SEASON AND PROGESTERONE**

Suporn Limsirichaikul and Graham K. Barrell  
 Animal and Veterinary Sciences Group, Lincoln University, New Zealand

This study was carried out to quantify the relationship between oestradiol and its effect on the secretion of LH in red deer (*Cervus elaphus*). Ten ovariectomised red deer hinds were treated i.m. with 0, 5, and 100 µg of oestradiol-17β, with and without progesterone pre-treatment (intravaginal CIDR-S for 14 days). Hinds were randomly allocated to dose of oestradiol so that each hind experienced 2 of the doses and at least 3 replicates were obtained for each dose. Blood samples were collected via intravenous cannulae at 15 minute intervals on 2 occasions, one before and the other during the breeding season.

In the non-breeding season oestradiol reduced LH pulse frequency, mean plasma LH concentration and the time to onset of suppression in a dose-dependent manner. However during the breeding season only the higher dose (100 µg) of oestradiol was able to suppress LH secretion initially. Also, the 100 µg dose provoked a surge of LH secretion at 17.5 h after injection, this response being restricted to the breeding season. Progesterone pre-treatment enhanced the suppressive effect of 100 µg oestradiol on mean plasma LH concentration, particularly in the non-breeding season. The table below provides estimates of the mean dose-response relationship using data pooled across seasons and progesterone treatment for each dose.

Linear dose-response regression of oestradiol (X) on LH secretion 3-6 h after treatment in red deer hinds.

Response (Y)	Regression equation	Correlation coefficient (%)
LH pulse frequency	$Y = -0.11 X + 0.93$	36.5
Plasma LH concentration	$Y = -0.22 X + 0.88$	39.1
Time to suppression	$Y = -2.65 X + 7.73$	76.6

These results provide an estimate of the dose-response relationship for the effect of oestradiol on LH secretion in red deer and indicate the magnitude of the influence of the season or progesterone pre-treatment on the response.

(1991)  
 Proceedings of the Endocrine Society of Australia 34: 189