

## PHOTOPERIOD MODIFIES SEASONAL CHANGES IN LH SECRETION IN OVARECTOMIZED RED DEER HINDS

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Previously, we have shown marked seasonal patterns of LH concentrations in ovariectomized hinds, in both the presence and absence of continuous oestradiol treatment, demonstrating the existence of steroid-dependent and -independent neuroendocrine mechanisms, respectively. The aim of the present study was to further investigate the steroid-independent mechanism in ovariectomized hinds, by monitoring the effects of altering photoperiod.

Plasma LH concentrations were determined from blood samples collected at weekly intervals for 23 months, in 15 adult ovariectomized hinds, that had been exposed to either Natural (outdoors), Simulated natural (indoors) or a Reversed (indoors) photoperiod for approximately the middle 9 months of this time. Daily photoperiodic manipulation was achieved by modifying the timing of dusk in an indoor photoperiod room, and then releasing the hinds outdoors after dark.

A very marked pattern in LH concentrations was noted in the Natural and Simulated natural groups, approximately the inverse of the prevailing photoperiod, with highest (mean 1.06, range 0.35-1.65 ng/ml plasma) and lowest (mean 0.29, range 0-0.85 ng/ml plasma) concentrations achieved in the 4 weeks prior to the winter and summer solstices, respectively. In contrast, hinds in the Reversed group had a significantly altered pattern, with generally intermediate concentrations (mean 0.79, range 0.13-1.48 ng/ml plasma) throughout, with little evidence of seasonal variation. Corresponding changes in plasma prolactin concentrations, coat growth and liveweight change were also detected.

These results suggest that photoperiod may regulate LH secretion in the absence of ovarian steroids, indicating that the steroid-independent mechanism may play a major role in controlling reproductive seasonality.

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