

## EFFECT OF MELATONIN ON LH SECRETION IN CASTRATED FALLOW DEER BUCKS DURING THE NON-BREEDING SEASON

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Seasonal changes in pituitary function characteristic of intact fallow bucks are also seen in long-term castrated bucks with the most notable event being a decline in the pulsatile secretion of LH in the spring, followed by a pronounced increase in LH release in summer, earlier than in entire bucks (1). Melatonin implants have been used to manipulate this seasonal pattern of reproduction, primarily to advance the breeding season (2). Little information, however, is available on the effect of melatonin administered during the non-breeding season and the present study investigates the pituitary function of long-term castrated bucks treated with melatonin during this period.

Five prepubertally castrated bucks were grazed outdoors at Ruakura (37° 46'S, 175° 20'E) for the duration of the experiment. Three received single melatonin implants (Regulin) at 28 day intervals from 3 Aug until 20 Nov inclusive. On 7 occasions during the non-breeding season (i.e. 13 Jul, 3 Aug, 31 Aug, 28 Sept, 26 Oct, 23 Nov and 21 Dec) all bucks were blood sampled from a jugular cannula at 15 min intervals for 8 hours. Plasma LH levels were measured by radioimmunoassay and LH pulses analysed by PULSAR. In the two control bucks, the mean plasma LH levels declined from Aug to Oct with a marked increase from Nov to Dec associated with increased pulse frequency and amplitude. The decline in LH was delayed in the treated bucks with mean levels declining to Nov but increasing in Dec. The pulse frequency rose in both groups in Sept and Oct despite declining mean concentrations. Although there was an increase in pulse frequency in the treated bucks by Dec this was not accompanied by an increase in pulse amplitude seen in the control bucks.

It is normally concluded that melatonin induces short-day affects in treated animals. In the present study melatonin administration began after only two months of increasing photoperiod and no short-day affects occurred. Such affects do occur, however, if bucks are treated after four months of increasing photoperiod (3). This suggests that in fallow deer there is a requirement for a minimum period of lengthening days for a short-day response to melatonin implants to be seen.

1. Asher, G.W., Peterson, A.J. & Bass, J.J. (1989). *J. Reprod. Fert.* 85: 657-665.
2. Asher, G.W., Day, A.M. & Barrell, G.K. (1989). *J. Reprod. Fert.* 79: 353-362.
3. Asher, G.W. & Peterson, A.J. (1991). *J. Reprod. Fert.* 91: 649-654.