

EXOGENOUS MELATONIN MODIFIES THE SEASONAL PATTERN OF LH AND TESTOSTERONE SECRETION IN ADULT MALE FALLOW DEER (DAMA DAMA)

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Male fallow deer exhibit seasonal patterns of reproduction (1). During the 3-month period following quiescence in late spring/early summer, the testis undergoes enlargement/increased androgenic activity; in response to increased pituitary activity; to attain peak size and output during the autumn rut (2). These changes are mediated by photoperiod (3) and can be accelerated by summer administration of exogenous melatonin (4). The present study investigated the effects of s.c. melatonin implants (Regulin; Regulin Ltd, Melbourne, Australia) on LH/testosterone (T) secretion during the transition into the rut. Implants were administered to 4 adult bucks for a 150d period starting 130d from the winter solstice. Four other bucks served as controls. 24-h profiles of plasma LH and T (30-min sampling frequency) were obtained 70, 98, 133 and 169d from treatment initiation. Treatment advanced rutting activity, maximum testis size and peak neck muscle mass by 6-8 weeks. In control bucks, LH and T pulse frequency was low (0-2 pulses/24h) at 70d and increased (5-7 pulses/24-h) at 98d. By 133 and 169d (rut) basal LH values increased, LH pulse frequency declined (0-1 pulses/24h) and T values exhibited a circadian rhythm of episodic surges. Melatonin treatment caused a shift in profiles, with highly pulsatile LH and T secretion (7 pulses/24h) occurring earlier at 70d and rut profiles at 98d. Their post-rut profiles (133 and 169d) were characterized by lower basal LH values and reduced frequency/amplitude of T values. It is concluded that exogenous melatonin, exerts at least some of its effects on seasonality via an alteration in pituitary LH secretion. References: (1) Asher et al. (1987) *J. Reprod. Fert.* 79, 353-362; (2). Asher et al. (1989) *J. Reprod. Fert.* 85, 657-665; (3) Schnare & Fischer (1987) *J Exp. Zool.* 244, 463-471; (4) Asher et al. (1988) *J. Reprod. Fert.* 84, 679-691.