

INDUCTION OF OESTRUS IN OVARIECTOMISED FALLOW (*Dama dama*) DOES

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Fallow deer are highly seasonal breeders with the onset of the rut occurring in mid-April and sexual activity ending in September. This study investigated, in ovariectomised (ovx) does, the inter-relationship between progesterone and oestrogen on oestrous behaviour in the breeding and non-breeding seasons. A total of 18 ovx does and two vasectomised bucks fitted with harnesses and crayons were used. Trials 1, 2 and 3 were conducted in the breeding season. In Trials 1 (N=17) and 2 (N=18) each doe was treated with an intravaginal CIDR device (Type S, 9% progesterone, Carter Holt Harvey, NZ) for 12 days and one of three doses of oestradiol benzoate (ODB; Sigma Chemicals, USA; Trial 1: 1, 0.1 and 0.01 mg; Trial 2: 0.05, 0.01 and 0.002 mg). In Trial 3 (N=18), the does were treated with a CIDR device for 12, 6 or 0 days and 0.05 mg ODB. Trial 4 (N=16) was conducted in February, during the non-breeding season. Eight does, given 4 melatonin implants (Regulin; Schering Agrochemicals Ltd, NZ) at 30-day intervals starting in November, and eight control does were treated with a CIDR device for 6 days and 0.1 mg ODB. In all trials ODB was administered intramuscularly 24 hours after CIDR device removal. The time to onset and duration of oestrus were checked every two h for 72 h after CIDR removal. In Trials 1, 3 and 4, blood samples were collected via jugular cannulae and the plasma analysed for LH. Dose of ODB had no effect on the time to onset of oestrus, or LH peak ($P < 0.05$; 21.6 ± 0.9 and 20.3 ± 0.6 h after ODB administration respectively). However, the duration of oestrus increased with the dose of ODB (Table 1).

TABLE 1 Effect of dose of ODB on oestrous behaviour in ovx fallow does (Trials 1 and 2).

Dose of ODB(mg)	1	0.1	0.01	0.05	0.01	0.002
Proportion of does in oestrus	5/5	6/6	4/6	6/6	1/6	0/6
Duration of oestrus (h)	12.8 ± 2.2^a	9.6 ± 1.8^a	2.0 ± 0.0^b	4.3 ± 1.5	2.0 ± 0.0	-

Values with different superscripts are different ($P < 0.05$).

Pre-treatment with progesterone was essential for the display of oestrous behaviour as none of the does treated with ODB alone showed oestrous behaviour. The period of CIDR device insertion (12 vs 6 d) had no effect on the time to onset, or duration of oestrus ($P < 0.05$; 20.0 ± 0.7 h and 2.8 ± 0.3 h). Melatonin implants increased the proportion of does that displayed oestrus in the non-breeding season ($P < 0.01$; 7/8 vs 1/8).

These data indicate that for oestrous behaviour oestrogen must be preceded by a period of progesterone treatment. Moreover, the animals become refractory to the exogenous hormone regimen in the non-breeding season. However melatonin implants can increase the sensitivity to oestrogen.