PROSTAGLANDIN-INDUCED LUTEOLYSIS IN THE RED DEER HIND

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The effectiveness of the prostaglandin $F_{2\alpha}$ analogue, cloprostenol, to induce luteolysis in the red deer hind was investigated by monitoring plasma progesterone concentrations at 4 or 6 h intervals for up to 72 h. The effects of age, dose, ovulation rate and stage of the oestrous cycle were assessed in 2 experiments conducted in successive breeding seasons.

In Experiment 1, 20 pubertal and 20 adult hinds were synchronised for oestrus with intravaginal progesterone (*CIDR*, Carter Holt Harvey). Fourteen days after progesterone withdrawal (approximately 12 days after the expected time of oestrus; stags were absent), 0, 100, 250 or 500 µg of cloprostenol (*Estrumate*, Coopers) was administered i.m. and the hinds bled by jugular venepuncture. One hind had low progesterone (>0.5 ng/ml) at the time of treatment. All 3 doses were equally effective in lowering progesterone concentrations in both groups of hinds. By 12 h after administration concentrations averaged 0.70-0.93 ng/ml in the 3 treated groups compared with 1.89 ng/ml in the untreated hinds and at 24 h averaged 0.39-0.70 ng/ml and 2.13 ng/ml respectively.

In Experiment 2, adult hinds (n=28) were treated to induce oestrous synchronisation with either mono-ovulation (*CIDR* or *CIDR* + PMSG, 200 iu *Folligon*, Intervet) or superovulation (*CIDR* + PMSG + FSH, 0.5 units *Ovagen*, Immuno-Chemical Products or *CIDR* + PMSG + FSH + GnRH, 500 µg *Fertagyl*, Intervet). Mean (and range) ovulation rates determined at laparoscopy were *CIDR* 1.0 (1); *CIDR* + PMSG 1.29 (1-2); *CIDR* + PMSG + FSH 4.14 (0-11); *CIDR* + PMSG + FSH + GnRH 12.29 (6-27). The hinds were then allocated to receive 750 µg of cloprostenol i.m. either 11 or 15 days after progesterone withdrawal (approximately 9 or 13 days after the expected time of oestrus; stags were present). Three hinds were anovulatory or had low plasma progesterone at the time of cloprostenol treatment. In the remaining hinds, plasma progesterone concentrations were reduced within 6 h of cloprostenol and continued to decline thereafter (Table 1).

Table 1. Mean (± sem) ovulation rates and progesterone concentrations.

		Mono-ovulation		Superovulation	
		d 11	d 15	d 11	d 15
Ovulation rate	mean	1	1	9.8 ± 3.68	8.1 ± 2.20
	range	-	-	2 - 27	2 - 18
Plasma progesterone (ng/ml)	0 h	1.50 ± .16	2.30 ± .30	10.7 ± 3.92	10.8 ± 2.31
	12 h	0.94 ± .17	0.77 ± .11	6.39 ± 2.55	2.79 ± 0.55
	24 h	0.32 ± .02	0.37 ± .03	1.95 ± 0.88	1.10 ± 0.13

Cloprostenol was effective in inducing complete luteolysis (<1.0 ng/ml progesterone for at least 24 h) in all 13 hinds treated on d 15 and in 10/12 hinds treated on d 11. The two hinds (1 mono-ovulation, 1 superovulation) in which luteolysis appeared incomplete were characterised by short-lived (12-24 h) reductions in progesterone concentrations.

These results indicate that exogenous prostaglandin $F_{2\alpha}$ is luteolytic in both young and adult red deer hinds and in hinds with multiple corpora lutea; however its effectiveness may be incomplete during the earlier stages of luteal function.