

Effect of bovine somatotropin (growth hormone) treatment on gonadotrophin profiles and ovarian follicle populations during the postpartum period in beef cows in low body condition

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Introduction

Cows in low body condition exhibit a prolonged postpartum anoestrous period and a delayed return to normal follicular function (Prado *et al* 1990). Previous studies have shown that the effects of body condition on gonadotrophin profiles are inconsistent (Wright *et al* 1990; Rhind *et al* 1992) indicating that the effects of body condition on ovarian function cannot be explained by changes in gonadotrophin profiles alone. Since nutritional state influences growth hormone profiles which in turn can affect ovarian function (Gong *et al* 1991), it was postulated that the effects of body condition on the duration of postpartum anoestrus could be mediated through changes in profiles of this hormone.

The aim of the present study was to determine the effect of growth hormone on ovarian follicle development and associated gonadotrophin profiles in post-partum beef cows.

Material and Methods

Thirty-two cows, calving in moderately low body condition (2.21; se = 0.075), were individually fed so that they maintained body condition throughout the study. At weeks 2, 4, 6 and 8 postpartum, 17 animals (group T) were injected (s.c.) with 320 mg bovine somatotropin (Elanco Animal Health Research, Basingstoke), a dose designed to release 23 mg/d for 14d. The remaining 15 animals were injected only with the carrier (sesame oil) and served as controls (group C).

At weeks 5 and 8 postpartum, blood samples were collected via jugular catheters at 20 min intervals for 20h. All samples were assayed for LH and every third sample was assayed for FSH.

At 9 weeks postpartum all animals were surgically ovariectomised and follicles >3.0 mm diameter were counted and measured.

Results

Mean concentrations of LH and FSH and mean LH pulse frequencies and pulse amplitudes in cows of each group were not affected by bST treatment (Table 1). However the mean LH pulse frequency was higher at week 8 than week 5.

TABLE 1 Mean concentrations ( $\mu\text{g/l}$ ) of FSH and LH and mean LH pulse frequencies (pulses/h) and pulse amplitudes ( $\mu\text{g/l}$ ) of bST - treated and control cows

	bST		Control		s.e.d.	Significance Treatment	Week
	Week 5	Week 8	Week 5	Week 8			
FSH conc	19.38	18.28	21.05	19.38	3.20	NS	NS
LH conc	0.44	0.69	0.44	0.47	0.124	NS	NS
LH pulse frequency	0.138	0.169	0.130	0.166	0.036	NS	*
LH pulse amplitude	1.24	0.93	1.28	1.38	0.189	NS	NS

There was no effect of treatment on the numbers of small (3-7.9 mm diameter) or large ( $\geq 8$  mm diameter) follicles present at week 9 postpartum (Table 2). However, all of the four animals which had ovulated by this time were in the bST treated group.

TABLE 2 Mean numbers of small (3-7.9 mm) and large (>8 mm) ovarian follicles per cow present at week 9 postpartum and numbers of animals which had ovulated.

	bST	Control	sed	Significance
No of large follicles	1.8	1.7	0.29	NS
No of small follicles	37.4	28.3	5.62	NS
No of cows ovulated	4/17	0/15	-	P = 0.10

### Conclusions

It is concluded that growth hormone administration did not affect gonadotrophin profiles in postpartum cows at the times studied. The numbers of follicles of each size class were also unaffected, but since only bST treated animals ovulated it is suggested that growth hormone may have enhanced development of the follicles of the treated animals.

### References

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