



**Interrelationship of Endocrine
and Physiological Events
During the Estrous Cycle
in Brahman Cattle**

Research Center

TECHNICAL
REPORT

NO.
80-2

THE SERUM LUTEINIZING HORMONE SURGE AND OVULATION TIME IN BRAHMAN, BRAHMAN X HEREFORD AND HEREFORD HEIFERS

R. D. Randel

SUMMARY

The timing of physiological changes leading to ovulation (shedding the egg from the ovary) is different in Brahman heifers as compared to Brahman x Hereford and Hereford heifers. The luteinizing hormone surge was smaller in Brahman heifers than in Brahman x Hereford or Hereford heifers, as shown in the previous report. The time from first standing heat to ovulation was 18.9 ± 2.2 hours in Brahman, 29.0 ± 1.3 hours in Brahman x Hereford and 28.6 ± 1.5 hours in Hereford heifers ($P < 0.005$). Time from the luteinizing hormone surge to ovulation was 18.5 ± 3.1 hours in Brahman, 22.2 ± 2.6 hours in Brahman x Hereford and 23.3 ± 2.1 hours in Hereford heifers. Due to short standing heat and a shorter interval from onset of standing heat to ovulation the heat check and timing of insemination is very critical in artificial insemination programs in Brahman cattle. Heat checks should be made at least every 6 hours and the cow should be inseminated no later than 12 hours after detection of heat.

OBJECTIVES

The objectives of this study were to show the relative differences between Brahman, Brahman x Hereford and Hereford heifers in timing of standing heat, the luteinizing hormone surge and ovulation time.

PROCEDURE

Nine Brahman, 6 Brahman x Hereford and 6 Hereford two year old heifers were treated with Prostaglandin $F_{2\alpha}$ -THAM salt or SC-21009 (Searle experimental estrous synchronization treatment) in sequential experiments. Heat checks were made using marker bulls and constant visual observation. Rectal palpation, for ovulation, began 16 hours after first standing heat and continued at 2 hour intervals until ovulation occurred. Blood samples were collected and serum luteinizing hormone levels determined by radioimmunoassay procedures. Data from the two synchronization treatments were tested for treatment differences and were pooled as serum luteinizing hormone, timing of the luteinizing hormone surge and ovula-

tion time were not affected by method.

RESULTS

Brahman heifers were significantly lower ($P < 0.05$) in luteinizing hormone levels than were Brahman x Hereford or Hereford heifers. (Figure 1). A breed x period interaction was found ($P < 0.05$) and period differences were apparent ($P < 0.005$).

Timing of physiological events was affected by breed (Table 1). Brahman heifers ovulated 10.1 hours earlier after first standing heat than did Brahman x Hereford and 9.7 hours earlier than Hereford heifers.

TABLE 1. TIMING OF PHYSIOLOGICAL EVENTS

BREED	HOURS (\pm standard error)		
	HEAT TO OVULATION	HEAT TO LUTEINIZING HORMONE SURGE	LUTEINIZING HORMONE SURGE TO OVULATION
Brahman	18.9 \pm 2.2	0.4 \pm 3.4	18.5 \pm 3.1
Brahman x Hereford	29.0 \pm 1.3	6.8 \pm 2.1	22.2 \pm 2.6
Hereford	28.6 \pm 1.5	5.3 \pm 1.3	23.3 \pm 2.1

As the time from the onset of standing heat to ovulation is shorter in Brahman cattle than in European cattle any artificial insemination program necessitates a more intense heat check in Brahman cattle than in European cattle.

Figure 1. Serum luteinizing hormone levels.

