

OVULATORY RESPONSE IN PROGESTERONE SYNCHRONIZED BONSMARA COWS AND HEIFERS

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Depressed conception rates after progesterone synchronization of oestrus in cattle are a major disadvantage. Conception rates varying from 12.5 to 65% have been reported (Trimberger & Hansel, 1955; Nellor & Cole, 1956; Hansel, 1967; Menne & Groskopf, 1969. Van Niekerk, Belonje & Spreeth (1970) reported improved conception rates with an interrupted course of progesterone when 50 mg is administered intramuscularly every second day until the fourth injection. Thereafter, progesterone is discontinued for 7 days, followed by six further injections of 50 mg every second day. They suggest that follicular atresia fails to take place if progesterone administration is commenced after a certain stage of follicular development, with the result that aged ova are produced from these follicles when progesterone is withdrawn.

This trial was planned to investigate the time of ovulation and conception rate of Bonsmara cattle synchronized following continuous or interrupted courses of progesterone.

In Treatment I, sixteen cycling Bonsmara cows with a history of normal reproductive performance and 25 cycling Bonsmara heifers were synchronized with an interrupted course of progesterone according to the procedure set out above. Oestrus observations were carried out twice daily for 9 days from the day of the last progesterone injection and the animals were inseminated 12 h after the onset of the first oestrus only.

In Treatment II, twenty cycling Bonsmara cows with a history of normal reproductive performance were synchronized following an uninterrupted course of 9 intramuscular progesterone injections of 50 mg each every second day. Immediately after withdrawal of the progesterone, estrus observations were carried out twice daily with the aid of a teaser bull. Ovarian activity and the day of ovulation were determined by rectal palpation every 24 h for 14 days from the day preceding the last progesterone injection. Cows in this group were not inseminated.

The occurrence of oestrus in Treatment I, is illustrated in Figures 1 and 2, and that of oestrus and the day of ovulation in Treatment II, are illustrated in Figures 3 and 4 respectively. Table 1 presents a summary of the time of ovulation of the cows after demonstration of heat.

The greatest number of animals in oestrus was recorded on day 4 in the cows, and on day 3 in the heifers, when the interrupted progesterone synchronization treatment was used (Fig. 1 and 2). In the cows on the uninterrupted progesterone treatment, standing oestrus reached a peak on day 5 and ovulation was most frequent on day 7 (Fig. 3 and 4). Of the cows and the heifers on interrupted progesterone synchronization, 87.5 and 72.0% respectively showed oestrus during the same period.

As illustrated in Fig. 1, 2 and 3, 50% of the cows and 72% of the heifers on interrupted progesterone synchronization and 65% of the cows on uninterrupted progesterone synchronization, showed estrus more than once.

In addition, it was observed that those cows and heifers that came into oestrus at an early stage after progesterone withdrawal, tended to return to oestrus a second and in some cases even third time.

A comparison of Fig. 3 and 4 shows that the day of ovulation differed markedly from the day of oestrus. According to Table 1, the time of ovulation from the onset of oestrus varied widely from the 12 h accepted as optimal for the insemination of this particular breed where short oestrus periods are known to occur.

Out of the 20 cows in Treatment II, 17 cows ovulated as a direct consequence of oestrus synchronization. Two cows showed standing oestrus on days 5 and 6 after withdrawal of progesterone, but ovulated only on days 11 and 12 respectively. Another cow showed standing oestrus on day 5, but ovulated only on day 14, while 3 cows in this group ovulated without showing any sign of oestrus, in these 3 cows ovulation and corpus luteum formation was noted following rectal palpation of the ovaries. Only 18.8% of the cows and 36% of the heifers conceived at the first oestrus periods after synchronization.

Table 1

Time of ovulation in cows after onset of heat

Time (h)	0-24	24-36	36-48	48-60	60-72	72 and over
Number of cows	6	2	5	2	1	1 (17)

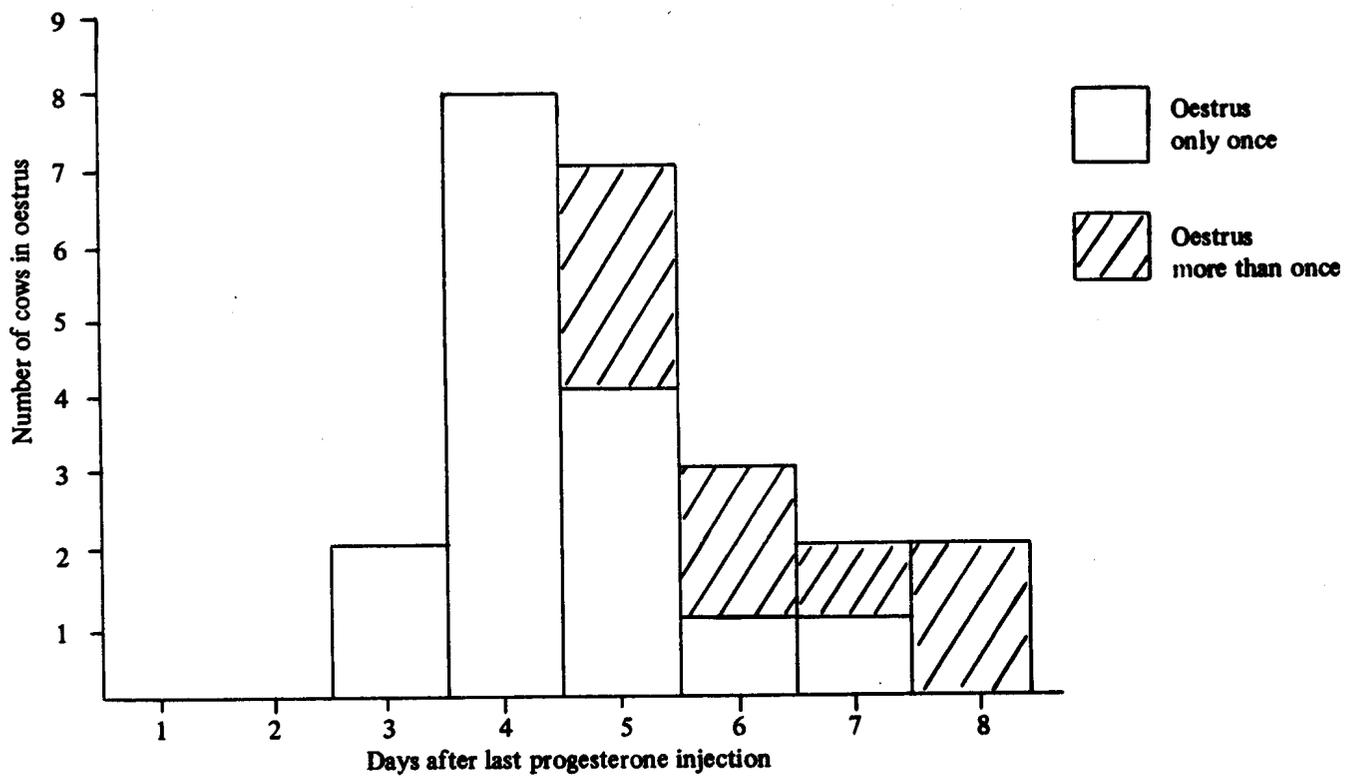


Fig. 1. Oestrus shown by cows after synchronization by an interrupted course of progesterone injections. (Treatment I).

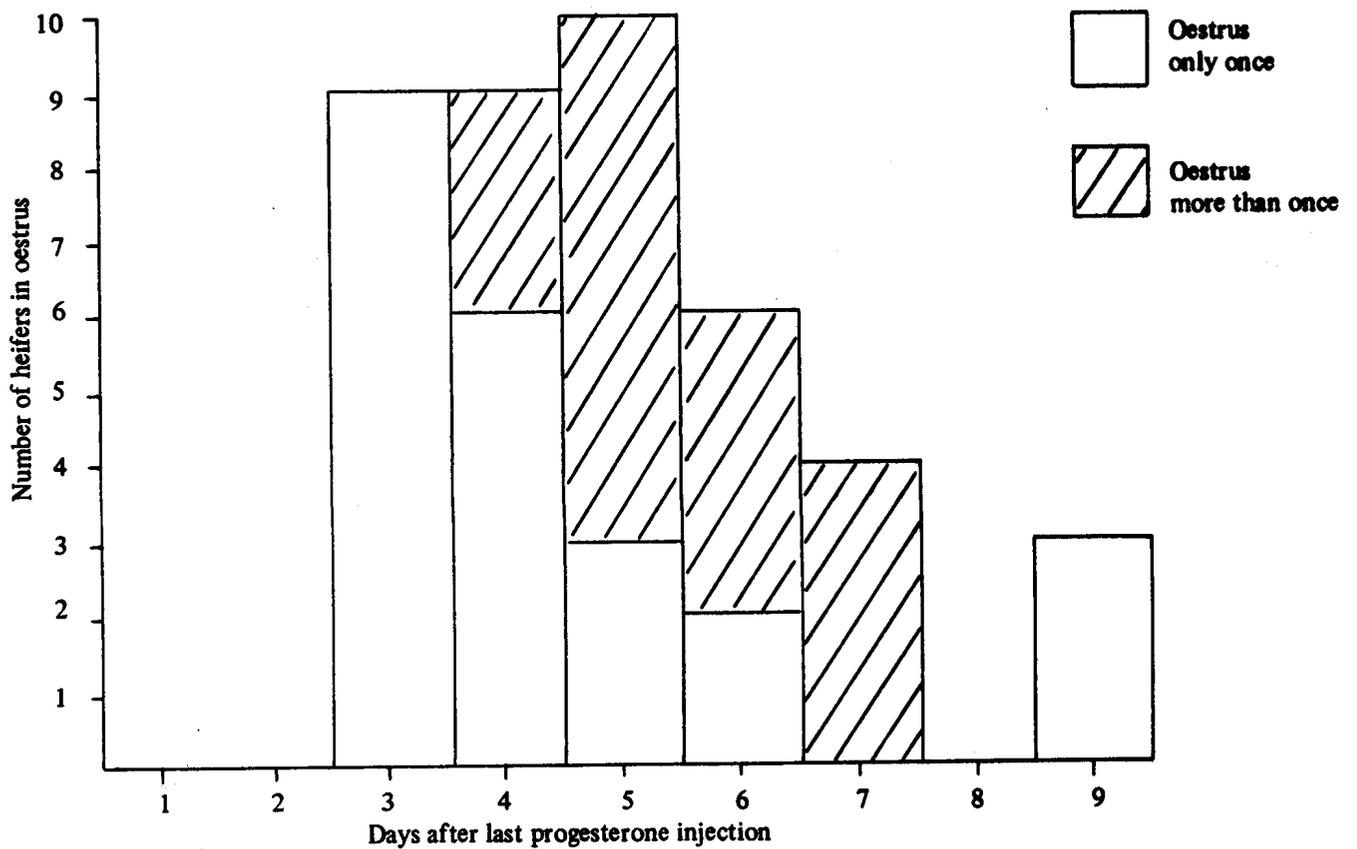


Fig. 2. Oestrus shown by heifers after synchronization by an interrupted course of progesterone injections. (Treatment I).

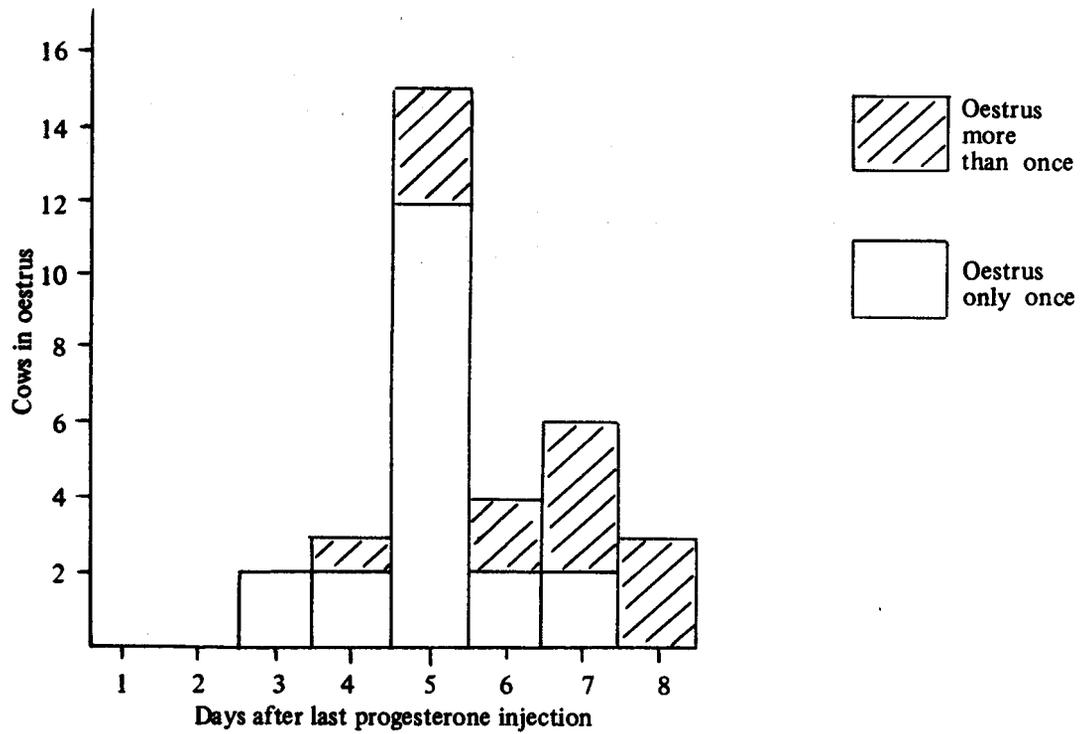


Fig. 3. *Oestrus showed by cows after synchronization with nine progesterone injections over seventeen days (Treatment II)*

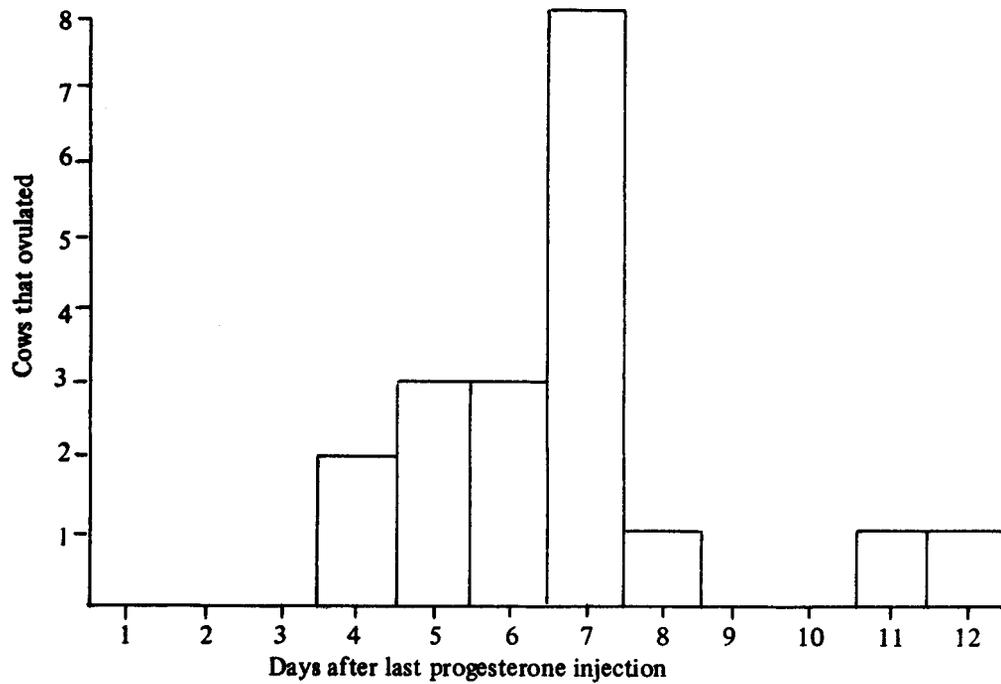


Fig. 4. *Day of ovulation as detected by rectal palpation after the second synchronization (Treatment II)*

References

- HANSEL, W. 1967. Control of the ovarian cycle in cattle. *Aust. vet. J.* 43, 441.
- MENNE, P.F. & GROSSKOPF, J.F.W., 1969. Synchronised breeding of beef cattle. *Proc. S. Afr. Soc. Anim. Prod.* 8, 167.
- NELLOR, J.E. & COLE, H.H.J., 1956. The hormonal control of estrus in the beef heifer. *J. Anim. Sci.* 15, 650.
- TRIMBERGER, D. & HANSEL, W., 1955. Conception rate and ovarian function following estrus control by progesterone injections in dairy cattle. *J. Anim. Sci.* 14, 224.
- VAN NIEKERK, C.H., BELONJE, P.C. & SPREETH, E.B., 1970. Post partum synchronization of the oestrus period of lactating friesland cows with 6-methyl-17-acetoxy-Progesterone (MAP) and PMSG. *Jl S. Afr. vet. med. Ass.* 41, 39.