

POST-PARTUM OESTRUS SYNCHRONIZATION IN BEEF CATTLE USING HIGH DOSAGES OF PROGESTERONE

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Post-partum anoestrus is one of the most important practical problems in suckled cows (Groves, Lauderdale, Riesen & Saiduddin, 1968), and this is especially so in indigenous Africander cattle.

For the occurrence of normal oestrus and ovulation it is necessary for the genital system to be under the influence of progesterone for a period of 10 to 12 days (Hansel & Snook, 1970). By imitating this period of luteal activity through the use of small dosages of exogenous progesterone (50 mg) administered by the intramuscular route every second day followed by one PMSG injection, it was possible to synchronize oestrus in Africander cattle (Menné & Grosskopf, 1968; Van Niekerk & Belonje, 1969; Grosskopf, 1974). However, it was found that while good synchronization resulted from these small dosages of progesterone, conception tended to be unsatisfactory due primarily to insufficient inhibition of follicular development (Van Niekerk, & Belonje & Spreeth, 1970; Van Niekerk & Belonje, 1970).

Coetzer & Van Niekerk (1975) found that a single subcutaneous injection of 150 mg progesterone will depress ovarian follicular development for a period of at least three days. This has led us to use even higher concentrations of progesterone per injection in preliminary work in cycling cows, from which it was evident that a single subcutaneous injection of 200 mg progesterone will inhibit follicular development for at least four days thereafter. (Unpublished results). The present report deals with a subsequent experiment in which similar high dosages of progesterone were used in only four injections with which we sought to ascertain whether oestrus in Africander type cows could be successfully synchronized during the protracted post-partum anoestrus period for which this breed is well known.

From 500 pregnant heifers, which had been placed in feedlots prior to term, two groups of respectively 140 and 77 animals were selected after calving in such a way that their calves were 40-45 days of age at the time of the beginning of the synchronization regime; an interval of three weeks separated the two groups with a view to testing the reproducibility of the procedure. Cows having experienced calving or related problems such as retained placentae were not included.

To facilitate the daily observations for oestrus, Group 1 was further divided into two lots of 70 cattle each. No animals exhibited behavioural oestrus from parturition to the beginning of the synchronization programme. Each cow daily received 1.5 kg of a balanced concentrate in addition to a good quality sorghum hay *ad lib*.

Progesterone (Merck Chemicals), dissolved in propylene glycol U.S.P. at a concentration of 20 mg/ml, was administered to each of the monotocous cows

as follows: Two hundred milligrams subcutaneously on Day 0 which was repeated on Day 4, followed by 100 mg by the intramuscular route on Day 8 and a further 50 mg by the same route on Day 10. An intramuscular injection containing 1 300 I.U. PMSG 36 hours later concluded the treatment programme.

The cows were inseminated with commercially available frozen semen between 12 and 16 h after the beginning of oestrus, after which they were kept under continued intensive observation for the next six weeks.

Results and discussion

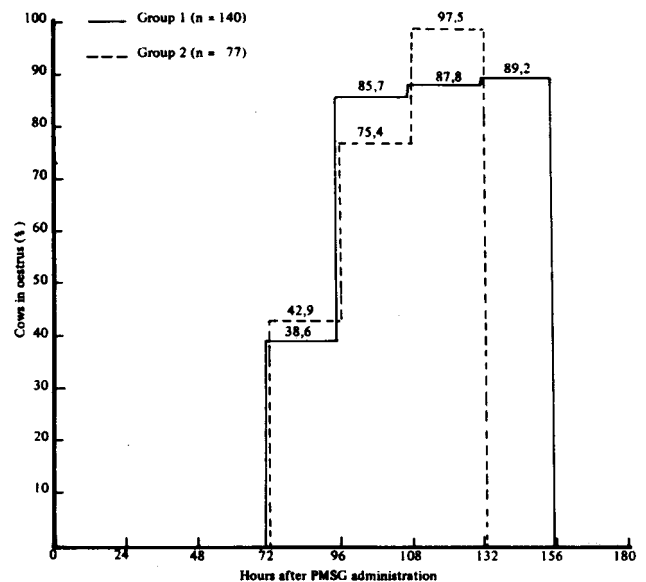


Fig. 1 Cumulative distribution of oestrus relative to PMSG administration

In both groups the first cows came on heat in the evening of the third day, about 72 h after PMSG administration. The cumulative distribution of the occurrence of oestrus as represented by the histogram in Figure 1 illustrates the efficacy of the treatment in both groups; as well as the reproducibility of the regime.

Table 1

Conception, based on Non-return after the second cycle

Group	Total num- in of cows inseminated	Non-return 2nd Cycle	Non-return as percent- age of	
			Inseminated cows	Total of Group
1(n=140)	125 (89,2%)	121	96,8	86,4
2(n= 77)	75 (97,4%)	62	82,7	80,5

Although pregnancy has not yet been confirmed at the time of this report, previous experience has shown that non-return figures are an acceptable means of indicating the expected conception rate, and from the summary of results in Table 1 it is evident that we have

succeeded in synchronizing oestrus by using only four progesterone and one PMSG injections. Moreover, the results are indicative of a highly satisfactory oestrus response and exceptionally good conception rate in non-cycling, post-partum Africander type beef cows.

References

- GRAVES, W.E., LAUNDER, J.W., RIESEN, J.W. & SAIDUDDIN, S., 1968. Studies on the post-partum cow. *Res. Bull. 270 agric. Exp. Stn. Univ. Wis.*
- COETZER, W.A. & VAN NIEKERK, C.H., 1975. Estrussinchronisering by Afrikanerbeeste buite die teelseisoen. *S. Afr. J. Anim. Sci.* (In press).
- GROSSKOPF, J.F.W., 1974. Synchronization of ovulation in beef herds: Improved conception rates after interrupted course of Progesterone administration. *S. Afr. J. Anim. Sci.* 4, 61.
- HANSEL, W. & SNOOK, R.B., 1970. Pituitary-ovarian relationship in the cow. *J. Dairy Sci.* 53, 945.
- MENNE, P.F. & GROSSKOPF, J.F.W., 1968. Experience with synchronization of ovulation in beef cattle. *Proc. S. Afr. Soc. Anim. Prod.* 7, 151.
- VAN NIEKERK, C.H., BELONJE, P.C. & LABUSCHAGNE, D.G.F., 1969. Synchronization of the oestrous periods of Afrikaner Cattle with Progesterone and PMSG. *Proc. S. Afr. Soc. Anim. Prod.* 7, 151.
- VAN NIEKERK, C.H., BELONJE, P.C. & SPREETH, E.B., 1970. Post partum synchronization of the oestrous period of lactating Friesland cows with 6-Methyl, 17 Acetoxy-progesterone (MAP) and PMSG. I. The distribution of oestrus and ovulation. *Jl S. Afr. vet. med. Ass.* 41, 39-43.
- VAN NIEKERK, C.H. & BELONJE, P.C., 1970. Post partum synchronization of the oestrous period of lactating Friesland cows with 6-Methyl, 17-Acetoxy-progesterone (MAP) and PMSG. II. Observations on ovarian abnormalities. *Jl. S. Afr. vet. med. Ass.* 41, 47-51.