SYNCHRONISATION OF OESTRUS WITH NORGESTOMET AND PROSTOGLANDIN F2α IN BEEF CATTLE

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The feasibility of oestrus synchronisation with Prostoglandin F2α (PGF) and Norgestomet (N) wee studied in sixty adult zebu cross cows, cycling hut not lactating, randomly allocated to the following treatments: a)- implantation of N with simultaneous injection of oestrogen (n = 22); b)- administration of 30 mg PGF on day 0 with a second dose on day 12 in those animals that did not respond to the first hormone dose (n = 22); c)- control group (n = 16). The animals were artificially inseminated twelve hours after initiation of oestrus. At the end of this experimental period, the cows were exposed to natural service until the end of the 120 day service period. 95% synchronisation was obtained in animals treated with N, while for PGF 68 and 95% synchronisation were obtained for the first dose and. culmilatively respectively. Time lapse between treatment and show of oestrus was 48.8 ±18.3 and 83.8 ± 39.9 hours, for a and PGF respectively. The conception rate for N, PGF and the control during the experimenta1 period was 55,64 and 69% respectively, while for the whole of the 120 day service period it was 76, 76 and 69% respectively. In conclusion, no difference was found between N and PGF in terms of the synchronisation of oestrus, fertility and overall subsequent conception rate. In consequence both methods could be used in farms which adjust themselves to the work regime proposed here.

Key words: Cattle, fertility, prostaglandin, norgestomet

One of the limiting factors for the increase in the efficiency of beef production is reproductive performance, This not only affects the selection intensity in the herd but also affects production costs through the expenses associated with maintaining a beef herd. One possibility for improving reproductive performance in the tropics is oestrus synchronisation. In cattle, two types of treatment have been used for oestrus synchronisation (Hafs et al 1976; Manns and Hafs 1976). The first involves the administration of progesterones for long enough to inhibit ovulation (Roche 1975; Roche 1976; Thimonier et al 1974; Wiltbank et al 1965) and the second is the use of prostaglandin F2α or one of its analogues (Chupin et al 1977; Cooper 1974; Lauderdale 1975; MacMillan et al 1977).

This work was designed to compare the practical use of oestrus synchronisation with Prostaglandin F2α(PGF) and Norgestomet (N).

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Materials and Methods

Sixty zebu cross cows which were cycling but not lactating, were rectally palpated for the presence of follicles and/ or corpora lutea and were randomly allocated to the following treatments: a)- implantation of N for 9 days with a simultaneous intra muscular injection of 5 mg of Estradiol valerate and 3 mg of progestagen (22 animals); b)- treatment with 30 mg PGF Fam Salt on day 0 and repeated on day 12 in those animals not responding to the first hormone dose. (22 animals); c)- control group (16 animals). The animals were observed twice daily for 30 days for the presence of oestrus with the aid of teaser bulls, and artificial insemination with semen from Charolais bulls was carried out 12 hours after heat was first observed. To distinguish heat and services after the trial period natural service with Brahman bulls was introduced after the 30 day experimental period until the end of the 120 day service period, to genetically distinguish the post experimental oestrus. Pregnancy was confirmed by rectal palpation 60 days after the service period and comparison between groups was made by t-test.

Results and Discussion

The efficiency of performance of PGF and N for oestrus synchronisation is shown in Table 1. Only 68% of cows exhibited heat after the first treatment of PGF with a mean post treatment time of 83.7 ± 34.9 hr, which was not significantly different from the 75% which would be expected in a randomly cycling herd. Of the 7 cows not responding to the first dose of PGF, 86% showed oestrus at 81.4 ± 45.2 hr after a second injection. Over the two treatments PGF synchronised oestrus in 95% of the treated cows. Although there was no significant difference in the percentage of synchronisation between PGF and N there was a tendency for earlier heat in the treatment with N with a mean of 48.8 ± 18.3 hr. During the thirty day experimental period 69% of the control group exhibited detected heat.

Table 1:
Response to synchronisation and/or observed heats

Experimental group		% sychronised and/or observed heat	Time to observed heat (hr)
PGF2α	1st dose	(15/22) 68%	83.7 ± 34.9[1]
	2nd dose	(6/7) 86%	81.4 ± 45.2
	Cumulative	(21/22) 95%	
NORGESTOMET		(21/22) 95%	48.8 ± 18.3
CONTROL		(11/16) 69%	

[1] $\bar{x} \pm SE$

The effect of oestrus synchronisation with PGF in this work agrees with the results of De Los Santos et al (1979), Sanchez et al (1979) and Lopez et al (1980) although the time to oestrus is different. Fuenmajor et al (1979) and De Los Santos et al (1979), using Norgestomet, reported a 100% synchronisation 72 and 120 hr after treatment respectively, although Koppel et al (1979) and Sanchez et al (1979) obtained 85% and 64% synchronisation at 60 and 72 hr after treatments respectively. It may be possible to explain the differences in the results by the different animals used, that is, cows and heifers, and/or the interval between parturition and treatment.

Table 2 illustrates the percentage pregnancy due to treatment and the final pregnancy percentage at the end of the 120 day service period. It can be seen that 55% conceived in the experimental period when treated with N and this was significantly less ($P<0.05$) than in the PGF treatment (64%) and in the control (69%). However, the conception percentages, for treatments with PGF and N were obtained over 15 days whereas those for the control group were obtained over 30 days. When these percentages are calculated on the basis of the number of animals served by the end of the 120 day service period, the difference between the two groups becomes more significant (76% and 76% for PGF and N, when compared to 69% for the control).

Table 2:
Conception percentage during experimental period and to end of 120 day breeding season

Experimental group		Conception percentage		
		During experimental period		To end of 120 day breeding season
		% synchronised	Total	
PGF	1st dose	(10/15) 67%		(12/15) 80%
	2nd dose	(4/6) 67%		(4/6) 67%
	Cumulative	(14/21) 67%	14/22 (64%)[a,1]	(16/22) 76%
NORGESTOMET		(12/21) 57%	12/22 (55%)[b]	(16/22) 76%
CONTROL			11/16 (69%)[a]	(12/16) 69%

[a,b] Significantly different ($P < .05$)

For N, conception rate percentages in the first post treatment heat as reported by Alberio et al (1979), Fuenmayor et al (1979), Koppel et al (1979), De Los Santos et al (1979) and Schiersmann et al (1979) were 35.8, 68.2, 30.0, 48.0 and 15.4% respectively, compared to the 55% obtained here. These authors also reported 53.3, 86.4, 42.5, 58.0, and 76.0%, respectively, for conception at the end of the experimental period. Although these values are different from those reported in this work the tendency is for a significant increase in conception rate when post experimental services are included. A similar picture is evident with PGF treatment.

Conclusions

Even with sophisticated methods for oestrus synchronisation in cattle there still remain problems to be solved in spreading their practical application. Although efficiency of oestrus synchronisation with prostaglandins and progestagens is satisfactory, the variability in response from the application of the treatment and the demonstration of heat must be reduced. Furthermore fertility of induced oestrus must be increased to justify the cost of hormone treatment. However, the application of the hormone treatments discussed here allows cost to be minimised and offers an alternative in those farms which are able to apply it. The use of one particular drug will depend on the cost and management procedures established in the production unit in question.

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