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Research Article

Efficacy of Progesterone and Estradiol Benzoate Combination to obtain Estrous and Pregnancy in Anoestrus Autochthonous Cows in Pasture-based Systems in Huambo, Angola

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Abstract

To evaluate the effectiveness of Progesterone (P_4) and Estradiol Benzoate (EB) combination to obtain estrous and pregnancy in anoestrus Autochthonous cows in pasture-based systems in Huambo, Angola, 14 cows were treated. The variables were: percent of cows in estrus (CE), open cows (OC), pregnant cows (PC) and BCS; The statistical test used was: Student's t for the effect of BCS on PC and OC. It was found the CE was 100% in the first 56 hours after treatment, also the BCS determined the PC and OC for a $p < 0.01$ ($OC=2.39 SD \pm 0.39$ points; $PC 2.92 SD \pm 0.28$ points). It was concluded that estrous induction was effective with this combination and BCS affected the response to pregnancy since non-pregnant animals had less than 2.5 points.

Introduction

Livestock activity in Angola, and specifically in Huambo, is characterized by long periods between calving of 730 days, with an average age of eight years and three total calves, which shows a low use of the reproductive potential of native cows in systems grass-based production [1]. To face this situation, one of the alternatives is the use of estrous induction and synchronization programs, among the cheapest protocols is the combination of progesterone (P_4) with estradiol benzoate (BE) and, according to Ferraz Junior, Pires [2], Pessoa, Martini [3], It is the most used combination in South America, however, its use in Africa is poorly documented and may be a viable alternative to improve the reproductive activity of cows in this environment where low-income producers predominate. For this reason, the objective was to evaluate the effectiveness of the combination of P_4 and BE according to body condition score (BCS) in the total number of open and pregnant Autochthonous cows in pasture-based systems in Huambo, Angola.

Materials and methods

The work was carried out at the "Marilu" farm located in the municipality of Caála, Huambo province, Angola. All the animals in the herd ($n=23$) were fed exclusively on pastures where *Hyparrhenia rufa* and *Esporobolus indicus* predominate. Grazing was carried out from the early hours of the morning until the afternoon, with water ad libitum. The reproduction method used was free mating with bulls of proven fertility. The calf rearing was with traditional suckling; the calf was with the mother at all times. Fourteen multiparous and anestrous cows of more than 120 days postpartum were selected from the herd, with BCS of more than 2.0 and less than 3.5 points on the scale of 1 to 5 (1 skinny-5 obese). A clinical-gynecological examination was performed by a pathophysiologist to check the anestrus (smooth and small ovaries). The following treatment scheme was: first, third and fifth days 50mg of injectable P_4 (Progesterone®, manufactured by Biopharmaceuticals Laboratories of Cuba, Labiofam) and on the seventh day 2mg of BE injectable was applied (Bengest®, manufactured by Biopharmaceuticals Laboratories of Cuba, Labiofam). Through visual observation, estrus was detected for 24 hours after BE application. Three months after the last application, pregnancy was diagnosed using the rectal palpation method to verify the effect of the estrous induction scheme. The comparison of the effect of BCS in pregnant and open cows was carried out using the Student's t test for independent samples for a level of significance of $p < 0.05$.

Results and Discussion

All females were in heat 24 to 56 hours after the last dose of BE. The lower rate of estrus presentation (85%) was reported by McDougall, Compton [4] with the same dose of BE but with P_4 -releasing intravaginal devices. Indicating that the results are varied. The total number of PC of the total treated was determined by the BCS, as can be seen in Table 1.

In general, exogenous progestins are considered appropriate for non-cyclical or anestrous postpartum cows [5], even when the ovarian response is not immediate, but the presentation of estrus caused by exogenous E_2 is. In studies carried out, it was shown that within the appropriate intervals, as the maximum value is approached, better results are obtained in the pregnancy rate [6], which suggests that this treatment should be evaluated with animals in better fat states. Open cows had low BCS, however, Pereira, Ferreira [7] obtained, in the Amazon region of Brazil, a pregnancy rate of 32.98% (188 pregnant zebu cows out of 570 treated) with BCSs between 2.0 and 2.5 points; which suggests that pregnancies can be obtained, but with modifications in management.

Table 1: Comparison of BCS means between pregnant and open cows (Student's t test)

Statistics Group						
	Pregnancy Diagnosis	N	Means	Standard Deviation	Mean Standard Error	
BCS	OC	11	2,39	,39312	,11853	
	PC	3	2,92	,28868	,16667	
Independent sample test						
F		Test of Levene for Equalities of Variances		Test for Equal Media		
		Sig.	t	gl	Sig. (bilateral)	
BCS	Equal variances are assumed	,989	,331	-2,872	21	,009

It is important to note that the cows were on a traditional suckling regimen, and that this aspect influences the postpartum ovarian response [8]. The effect of suckling on the ovarian response is evident, both induced (by hormonal treatment) and spontaneous (given the high incidence of anestrus), so it can be suggested that restricting the calf's access to the cow temporarily, by less, and in conjunction with this hormonal therapy, it could be a favorable management effect to obtain higher rates of pregnancy, provided that BCS and ovarian activity status are taken into account. Based on these results, it would be convenient and feasible to implement estrous and ovulation induction plans to reduce the excessive calving interval reported by de Loyola Oriyés, Cachicolo Gila [1] in the extensive livestock conditions prevailing in Angola.

Conclusion

The induction of oestrus with the proposed P4-BE combination in anestric native cows was effective in all animals, BCS affected the response to gestation due to the fact that non-pregnant ones had less than 2.5 points.

Recommendations

To assess the effect, in all pregnancies, of this treatment combined with restricted suckling of the calf temporarily. It can be considered an accessible alternative for low input producers in these production conditions.

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