Pregnancy Rate in Zebu Cows with Two Different Postpartum Intervals Exposed to a Two-Bull Rotational System

R. Molina1, C.S. Galina2, M. Maquivar3, S. Estrada3, A. Chávez1 and G.S. Díaz2

1Instituto Tecnológico de Costa Rica, Escuela de Agronomía; 2Universidad Nacional Autónoma de México, Facultad Medicina Veterinaria y Zootecnia; 3Universidad Nacional, Escuela de Medicina Veterinaria, Costa Rica

*Correspondence: Apartado Postal 22-060, México 22 DF 14000, México


ABSTRACT

In order to evaluate the reproductive effect of a rotational breeding system, the pregnancy rate of 69 Zebu cows was assessed, 32 late postpartum (211 ± 93 days postpartum, LP) and 37 early postpartum (averaging 63 ± 8 days after calving, EP). In the LP group, 60% (19/32) were cycling before exposure to the bulls but only 38% (14/37) in the EP group. The two groups were dissimilar from the start (p<0.05). The cows were exposed in a rotational breeding system, with six Brahman bulls with previous sexual experience paired off in three groups (A–B, C–D and E–F). The cows were exposed to each pair of bulls for a period of 3 weeks, with one week in between each period, when the females were without the presence of a male. In the LP group, the pair of bulls A–B obtained a pregnancy rate of 72% (23/32), whereas for bulls C–D the pregnancy rate was 33% (3/9) and for bulls E–F the pregnancy rate was 67% (4/6). In contrast, for the EP cows, bulls A–B obtained a pregnancy rate of 32% (12/37), bulls C–D a pregnancy rate of 67% (12/18) and for bulls E–F a pregnancy rate of 55% (6/11). The percentage pregnancy obtained using the pair of bulls A–B differed (p<0.05) between LP and EP, whereas for bulls C–D and E–F it was similar. The pregnancy rate was different (p<0.05) in the first 3 weeks of mating for the LP group, the highest number of cows becoming pregnant during the first 3 weeks of the study. In contrast, the highest number of pregnancies in EP occurred evenly during the last 6 weeks. This study suggests that the reproductive performance of pairs of bulls in a 9-week rotational programme with the overall pregnancy rate is similar (94% in the LP and 81% in the EP), however, the time taken for the females to become pregnant, and hence the performance of the bulls, is related to the average number of days postpartum for the cows.

Keywords: Brahman, cows, early postpartum, late postpartum, pregnancy rate, rotational breeding, Zebu

Abbreviations: EP, early postpartum; LP, late postpartum

INTRODUCTION

One of the main obstacles to increasing the reproductive efficiency of a herd of Zebu cattle in the tropics is the extended anoestrous period following parturition. This is due to the poor physical condition of the cows at parturition, the effect of suckling and
inadequate handling of the mating programme, causing a delay in the onset of ovarian activity in the animals, thus increasing the interval between calving (Galina and Arthur, 1989).

Multiple-sire mating programmes have been employed in attempts to overcome this problem. A group of cows are presented with several bulls (Lunstra and Laster, 1982), with the intention of stimulating the onset of ovarian activity in order to promote early pregnancies, so reducing the interval between calving (for review see Galina and Arthur, 1989). Price (1987) advanced the concept that the reproductive performance of bulls is most affected by factors such as age of the male, breeding experience, male-to-female ratio and social dominance.

Recent studies have shown that keeping a group of postpartum cows in contact with bulls can help reduce the anoestrous period (Gifford et al., 1989; Hornbuckle et al., 1995; Bolaños et al., 1997). Alberio and colleagues (1987) and Bolaños and colleagues (1998) measured the effect of bulls on the onset of oestrous signs in postpartum cows. Their results showed that the presence of the bulls increased the number of cows in oestrus and also stimulated the onset of ovarian activity. Most of these studies, however, were directed towards employing several bulls to enhance oestrous activity in anoestrous cows and, recently, Molina and colleagues (2001) questioned the applicability of using more than two bulls to improve reproductive performance, suggesting that a pair of bulls might be sufficient to compensate for the failure of a single bull and produce a biostimulatory effect (Molina et al., 2002).

The objective of this study was to evaluate the reproductive effect of rotating three pairs of bulls every 3 weeks, each pair being used for two periods of 3 weeks, with a rest of one week between the periods.

MATERIALS AND METHODS

Location

The study was carried out in the Bovine Production Unit of the Technological Institute of Costa Rica, located in Florencia, San Carlos, Alajuela (10° 25’ N, 84° 32’ W). This area is situated 75 m above sea level in the humid tropics, with annual rainfall of 3055 mm, relative humidity of 85% and an average temperature of 24°C.

Animals

On the basis of a literature review (Galina and Arthur, 1989), in which it was reported that cows with a calf at foot did not resume ovarian activity in less than 100 days after parturition, 69 multiparous non-pregnant Zebu cows were arbitrarily divided into two groups. Group LP (late postpartum) consisted of 32 multiparous cows that had calved 211 ± 93 days earlier, of which 10 were lactating. At the start of the study 60% (19/32) of the cows in group LP were cycling, as evidenced by the presence of a corpus luteum in two consecutive ultrasound examinations prior to exposure to the bulls. Ultrasound