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## INTRODUCTION

Occasional assistance during calving is important to ensure cow and calf survival. Early intervention has the potential to prevent stillbirths, while unnecessary or premature intervention can also cause injuries in the birth canal due to the lack of proper soft tissue dilation. Although the prevalence of dystocia may appear to be low (between 4.1 and 13.7%), calving assistance rates are high, varying between 10 and >50%. In this study we hypothesized that crossbred lactating dairy cows that had a single live calf without assistance would have a healthy postpartum period and better future reproductive performance than cows that need calving assistance. The aim was to evaluate in crossbred lactating dairy cows that had a single live calf, the association between type of calving (normal or assisted) on uterine disease occurrence, and its effects on number of artificial inseminations (AI) per conception and pregnancy rate at 150 days postpartum (DPP).

## MATERIAL AND METHODS

During calving cows were monitored and the type of calving was classified as normal or assisted, being that normal calving needed no interference by humans while assisted calving needed some type of human interference, such as a calf puller. The uterine diseases evaluated during the postpartum period in the present study were retention of the fetal membranes (RFM), metritis and clinical endometritis (CE). RFM was considered when the cow did not totally eliminate the fetal membranes within the first 12 hours after calving. Metritis was characterized by an enlarged uterus and a watery red-brown fluid to viscous off-white purulent uterine discharge, which often has a fetid odor. CE was defined by the presence of purulent vaginal discharge containing more than 50% of pus, as analyzed by Metrichick®, an involuted uterus at transrectal palpation and no clinical systemic signs diagnosed between 21 and 35 DPP. Cows considered healthy, with body condition scores (BCS) greater than 2.5 (scale 1 = very skinny to 5 = obese), and adequate uterine condition were submitted to the following timed artificial insemination (TAI) protocol. Statistical analyses were performed using SAS Studio (SAS Institute Inc., Cary, NC). Only variables with a P-value  $\leq 0.15$  were retained in the final model. Statistical significance was defined as  $P \leq 0.05$ .

## RESULTS

A total of 801 calving of a single and live calf were analyzed, of which 766 were normal and 35 were assisted. Most of the cows with normal calving had a healthy postpartum period (73.89%), while most of the cows with assisted calving had uterine diseases (74.29%; Table 1). The number of AI per conception was similar in cows that had normal or assisted calving (2.39 $\pm$ 0.08 and 3.00 $\pm$ 0.43,  $P = 0.16$ ; Table 2). There was no evidence of a negative influence of type of calving on pregnancy rate at 150 DPP of crossbred lactating dairy cows ( $P = 0.44$ ; Table 2). Healthy cows had a higher pregnancy rate at 150 DPP than cows affected by uterine diseases in the postpartum period (51.65 vs. 42.92%; Table 3).

Table 1. Uterine diseases postpartum (retention of the fetal membranes, metritis and/or clinical endometritis) occurrence according to type of calving (normal vs. assisted). Lagoa Grande-MG, Brazil, 2019.

Type of calving (n)	Healthy	Uterine diseases occurrence
Normal (766)	73.89 % (566) <sup>a</sup>	26.11% (200) <sup>b</sup>
Assisted (35)	25.71 % (9) <sup>b</sup>	74.29 % (26) <sup>a</sup>

a,b Different superscripts within the same line indicate significant differences ( $P < 0.05$ ). n = number; % = percentage.

Table 2. Pregnancy rate at 150 DPP and number of AI per conception according to type of calving (normal vs. assisted) in crossbred dairy cows, Lagoa Grande-MG, Brazil, 2019.

Type of calving (n)	Pregnancy rate at 150 DPP (%)	AI /conception (mean $\pm$ SE)
Normal (766)	49.48	2.39 $\pm$ 0.08
Assisted (35)	42.86	3.00 $\pm$ 0.43
<i>P</i> value	0.44	0.16

n = number; % = percentage, SE = standard error, DPP = days postpartum, AI = artificial insemination.

Table 3. Pregnancy rate at 150 DPP according to postpartum uterine disease occurrence in crossbred dairy cows, Lagoa Grande-MG, Brazil, 2019.

Postpartum condition (n)	Pregnancy rate at 150 DPP (%)
Healthy (575)	51.65 <sup>a</sup>
Uterine disease (226)	42.92 <sup>b</sup>

a,b Different superscripts indicate significant differences ( $P < 0.05$ ). n = number; % = percentage

## CONCLUSION

The majority of lactating crossbred dairy cows undergoing assisted parturition have uterine diseases, and healthy cows have a higher pregnancy rate with 150 DPP. Crossbred lactating dairy cows that had normal or assisted calving had similar number of AI per conception, and there is no evidence of a negative influence of type of calving on the pregnancy rate at 150 DPP.