

Vaccination with *Brucella abortus* strain RB51 at the beginning of E2/P4-based TAI protocol does not affect pregnancy and calving rates of healthy *Bos indicus* beef cows

J.A.G. Drumond¹, R.D. Mingoti¹, L.C.L. Ferreira³, H. Ayres¹, Geert Vertenten,² L.M. Vieira¹

INTRODUCTION

Bovine brucellosis is a zoonosis that has been a target in eradication programs in several countries due to concerns on public health and its negative impact on livestock production. Besides abortion, *Brucella abortus* causes birth of weak offsprings and low fertility. One of the main alternatives for eradication is the vaccination with *Brucella abortus* strain, which is recommended by the World Organization for Animal Health.

OBJECTIVE

The hypotheses for this study was that vaccination with *Brucella abortus* strain RB51 at the beginning of Estradiol/ Progesterone (E2/P4)-based TAI (Timed Artificial Insemination) protocol does not affect fertility in healthy cows and demonstrates that the vaccine can be used prior TAI in Brazilian commercial farms as part of a strategy to control brucellosis.

MATERIALS AND METHODS

- ▶ The study was conducted in Miranda, Mato Grosso do Sul, Brazil, from October 2016 to January 2017.
- ▶ A total of 724 Nelore and crossbred females from two commercial farms, including heifers, primiparous and multiparous randomly assigned to a treatment with 2 mL dose of a vaccine with *Brucella abortus* strain RB51 (n=349; RB51) or Control (saline solution, n=375) group.
- ▶ Vaccination was performed subcutaneously on the first day of E2/P4-based TAI protocol (Day 0) (Fig.2).
- ▶ Pregnancy diagnosis was carried out 30 days after TAI and all calvings were registered.
- ▶ Descriptive statistics and inference were performed using SAS/STAT software, included Freq, Means and Glimmix procedures.

Vaccination with *Brucella abortus* strain RB51 vaccine can be performed on the first day of E2/P4-based TAI protocol with no negative effects on pregnancy rate and calving rate of Nelore healthy cows. Therefore, the vaccine can be an important strategy to support farms aiming to eradicate brucellosis.



To download this paper, scan the QR code!

RESULTS

- ▶ No interactions between treatment and other studied variables were found.
- ▶ Confirming our initial hypothesis, the pregnancy per artificial insemination (P/AI) and calving rate between the treated and control groups demonstrated no significant differences, as depicted in Figure 3.

FIGURE 3. Pregnancy rate and calving rate of healthy *Bos indicus* beef cows treated with a 2 mL dose of a vaccine containing the *Brucella abortus* strain RB51 (Bovilis RB-51[®], MSD Animal Health, São Paulo, Brazil) on the onset of the E2/P4-based TAI.

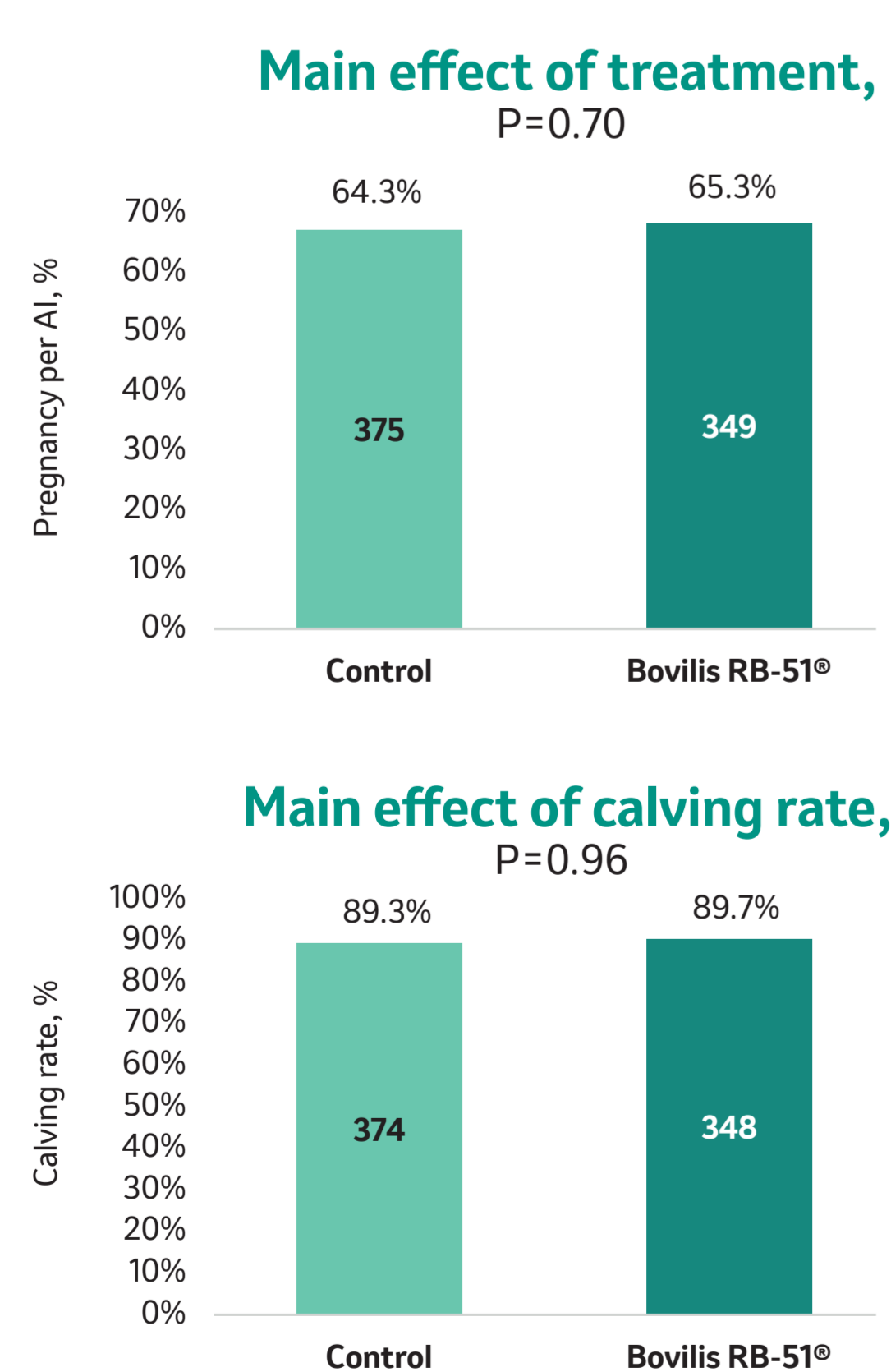
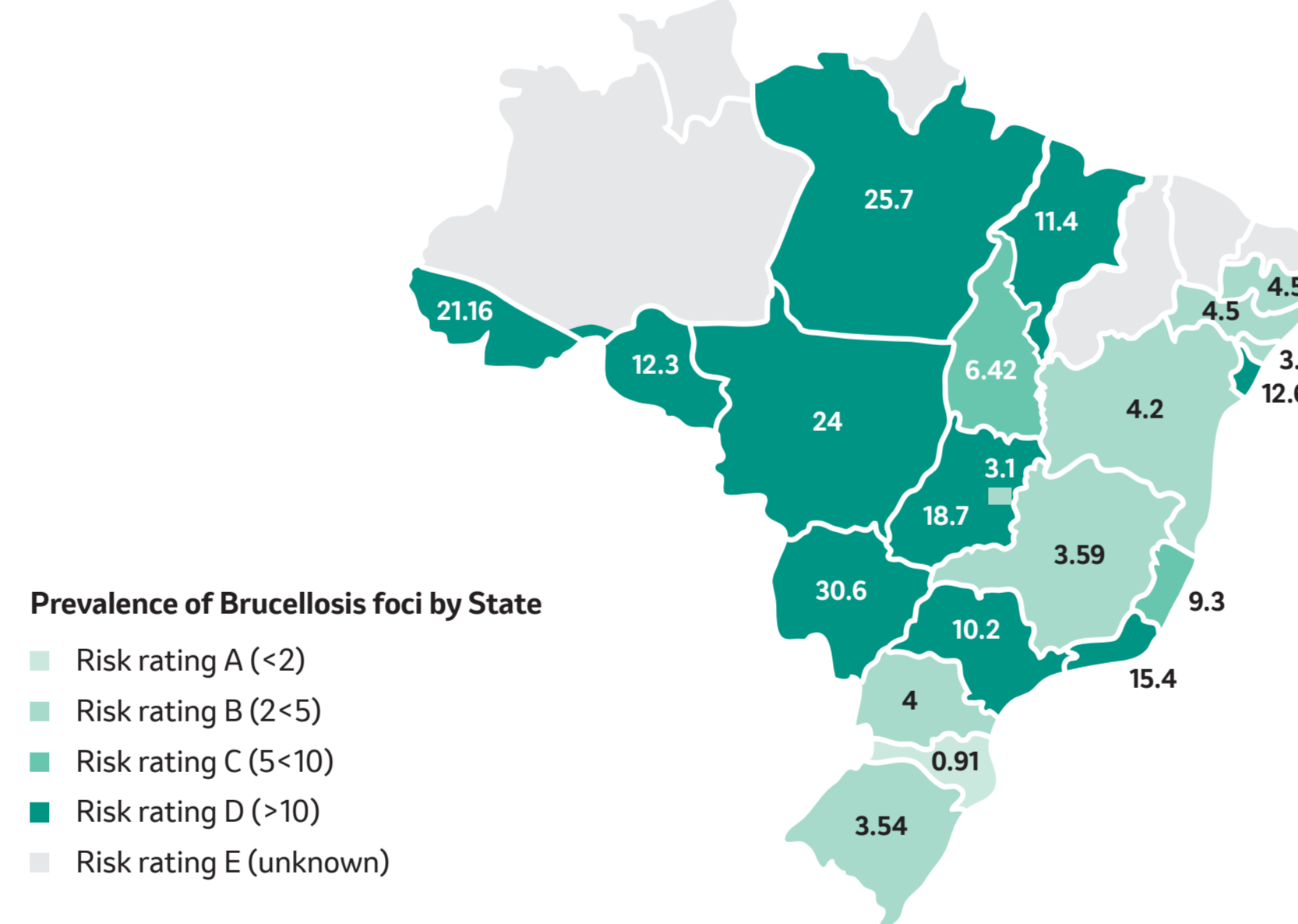


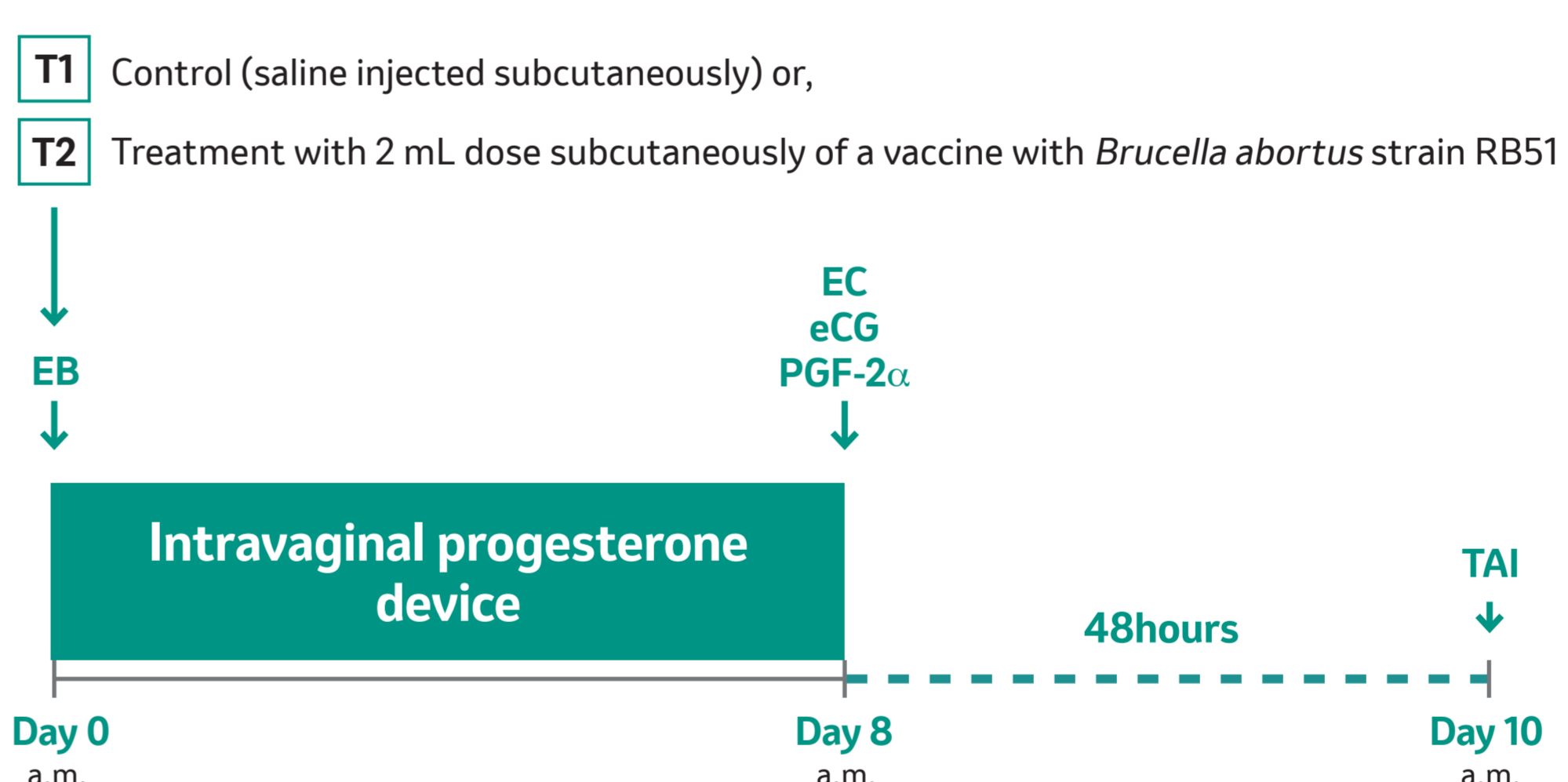
FIGURE 1. The map illustrates the prevalence of bovine brucellosis outbreaks in the Federative Units of Brazil. It provides a visual representation of the prevalence of this disease in each Federative Unit, highlighting areas with higher incidence rates.



Prevalence of Brucellosis foci by State
 ■ Risk rating A (<2)
 ■ Risk rating B (2-5)
 ■ Risk rating C (5-10)
 ■ Risk rating D (>10)
 ■ Risk rating E (unknown)

1. Programa Nacional de Controle e Erradicação da Brucelose e da Tuberculose Animal - PNCEBT [Internet]. Ministério da Agricultura, Pecuária e Abastecimento. Available from: <https://www.gov.br/agricultura/pt-br/assuntos/saude-animal-e-vegetal/saude-animal/programas-de-saude-animal/pncebt/controle-e-erradicacao-da-brucelose-e-tuberculose-pncebt>

FIGURE 2. Experimental design for the treatments to induce ovulation in healthy *Bos indicus* cows

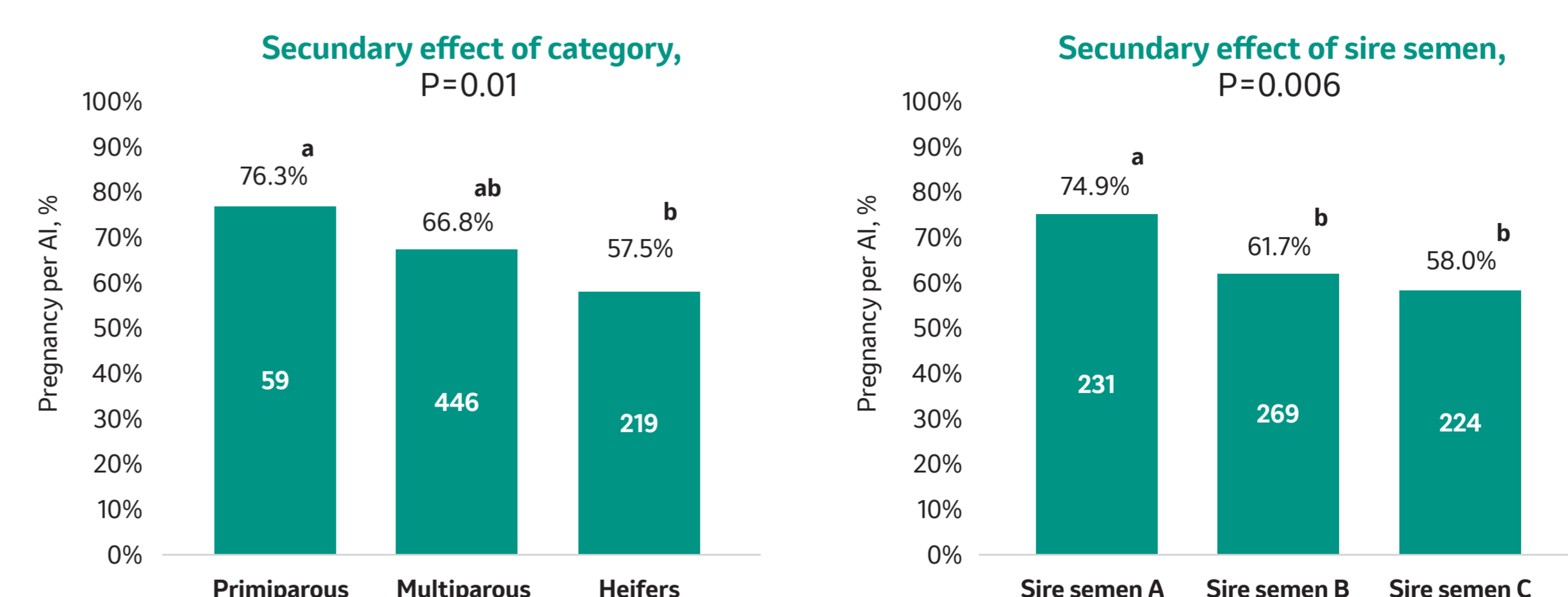


T1 - Control group treated with 2 mL of saline solution; T2 - treatment with a 2 mL dose of a vaccine containing the *Brucella abortus* strain RB51 (Bovilis RB-51[®], MSD Animal Health, São Paulo, Brazil); EB = 2.0 mg estradiol benzoate, P4 = 1.0 g progesterone, PGF2α = 530 µg sodium cloprostenol, eCG = 300 IU equine chorionic gonadotropin, EC = 1.0 mg estradiol cypionate, TAI = Timed artificial insemination.

RESULTS

In the evaluation of pregnancy rate, secondary effects were observed on the sire and category of cows. The study included recording and consideration of various factors as random effects in the model. These factors included the category of cows (heifer, primiparous, or multiparous), breed, farm, sire semen, AI technician, heat, and body condition score (Fig. 4).

FIGURE 4. Impact of category of cow and sire semen on the pregnancy per AI



AUTHORS' AFFILIATION

1. MSD Animal Health, 296, Dr. Chucri Zaidan Ave, Vila Cordeiro, São Paulo, São Paulo, Brazil
2. MSD Animal Health, Wim de Körverstraat 35, 5831, AN, Boxmeer, The Netherlands
3. Cia da Pecuária Assessoria, Rua Dona Virgínia, 316, Campo Grande, Mato Grosso do Sul, Brazil

MSD Animal Health

Copyright © 2024 Merck & Co., Inc., Rahway, NJ, USA and its affiliates. All rights reserved. GL-SOT-220700002

Abstract number: 1126. Board number: 152 May 21st



ACKNOWLEDGMENT
 Cia Agropecuária Assessoria
 Campo Grande - MS - Brazil



MSD
 Animal Health