

# Effectiveness of brucellosis control using the RB51 vaccine in adult beef cows

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## INTRODUCTION

The RB51 vaccine has been successfully used in programs to control brucellosis outbreaks by mass vaccination of herds in countries such as Brazil. Vaccination of adult cows with the RB51 strain is an alternative to reduce the spread of the pathogen in commercial herds. However, vaccination strategies still need to be evaluated.

## OBJECTIVE

The aim of this study was to compare the effectiveness of brucellosis control and reproductive performance using one or two doses of RB51 (*Bovilis RB51*, MSD Animal Health), given at 6-months interval, in commercial beef farms with cows previously vaccinated with S19 at 3-8 months of age.

## MATERIALS AND METHODS

Two commercial Brazilian beef farms (Farm1 n=477/Farm 2 n=673) with records of endemic brucellosis and a 6-8% prevalence of positive cows were selected. The regular vaccination protocol included only cows previously vaccinated with S19 at 3-8 months of age. Rose Bengal testing (RB) was carried out in all cows at D0. Cows with positive results were re-evaluated using a Slow agglutination test (2-ME, 2-mercaptoethanol), and those positive were discarded. Non-reactive cows, in each farm, were randomly assigned into three experimental groups, balanced for parity, days of pregnancy and Body Condition Scores:

- ▶ G1, single dose of RB51
- ▶ G2, two doses of RB51 (6 months apart)
- ▶ G3, control group (non-RB51 vaccinated)

Within each herd, cows were kept under the same management. Additional serological (RB) and 2ME tests were carried out on D90, 180, 270 and 360. Positive (2-ME) cows were discarded. Variables were analyzed using SAS software (SAS Institute Inc., Cary, NC), at 5% of probability.

Vaccination with a single dose of RB51 in adult beef cows, previously vaccinated with S19, reduces the occurrence of new cases of brucellosis and the spread of the disease. Additionally, vaccination improves the reproductive performance of immunized cows.

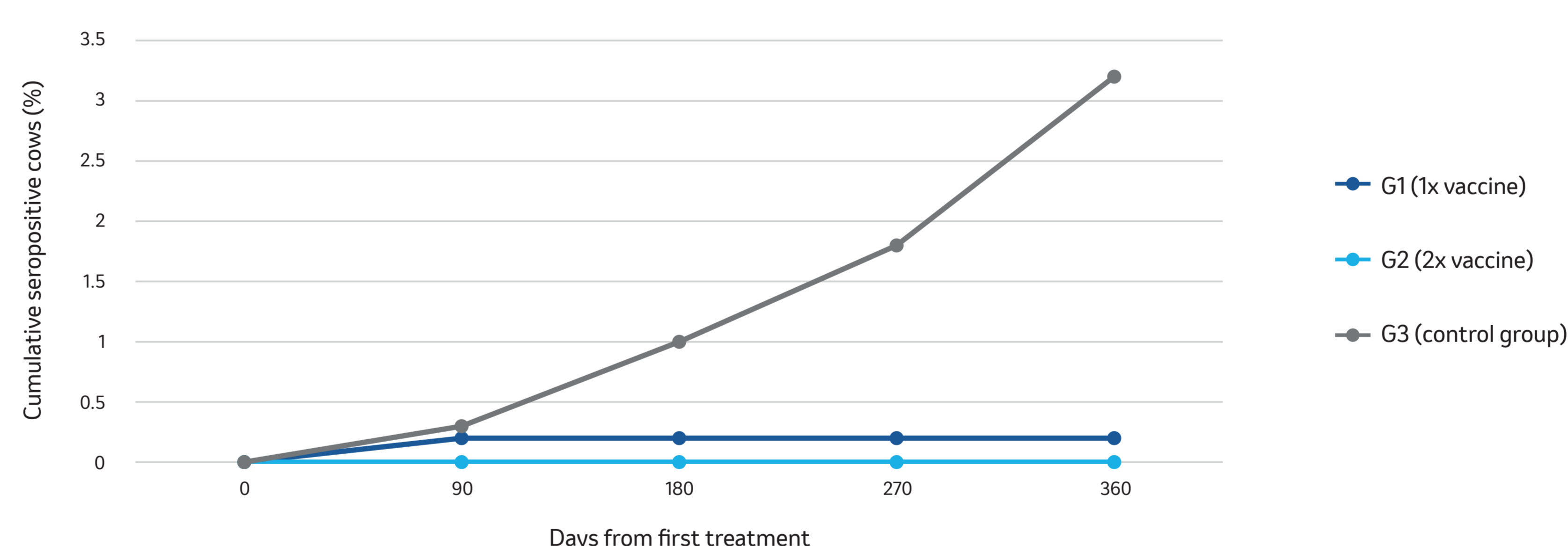


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## RESULTS

Seropositive cows were still detected in both vaccinated and control groups at D90 (1/513 and 1/312 for G1 and G3, respectively). However, no new infections, as indicated by negative seroconversion in the 2-ME tests, were detected in G1 at D180 or in G1 and G2 at D270 and D360, whereas new seropositive cows were diagnosed in all exams in G3. Therefore, the cumulative number of new infections was lower in vaccinated than in control cows [0.36b (1/274), 0.00b (0/279) and 3.65a% (10/274) for groups G1, G2 and G3 respectively; P<0.05].

Cumulative percentage of cows infected after beginning of the study



## RESULTS

▶ There was no difference (P=0.233) among groups in the calving to first Artificial Insemination (AI) interval.

▶ However, in farm 1 the number of days open was greater in G3 (85.5 ± 15.9b days) than in vaccinated groups (79.7 ± 14.2a and 77.2 ± 13.7a for groups G1 and G2, respectively; P=0.043). **Table 1.**

▶ In farm 2 the pregnancy rate (PR) was lower in G3 (80.1%b) than in the G1 (89.1%a) but didn't differ to the PR in G2 (85.0%ab); P=0,041.

TABLE 1. Reproductive efficiency of cows not-vaccinated or vaccinated with one (G1) or two doses (G2) of RB51 on Farm 1

Group	N	Calving-first AI <sup>1</sup>	AI / Conception	Days Open
G1 (1x vaccine)	176	36.2 ± 7.8 <sup>a</sup>	1.91 ± 0.24 <sup>a</sup>	79.7 ± 14.2 <sup>b</sup>
G2 (2x vaccine)	135	35.4 ± 7.2 <sup>a</sup>	1.83 ± 0.22 <sup>a</sup>	77.2 ± 13.7 <sup>b</sup>
G3 (control)	138	39.1 ± 8.9 <sup>a</sup>	2.25 ± 0.4 <sup>a</sup>	85.5 ± 15.9 <sup>a</sup>

TABLE 2. Reproductive efficiency of cows not-vaccinated or vaccinated with one (G1) or two doses (G2) of RB51 on Farm 2

Group	N	Calving-first AI <sup>1</sup>	Pregnancy rate
G1 (1x vaccine)	138	41.2 ± 9.6 <sup>a</sup>	89.1% <sup>a</sup>
G2 (2x vaccine)	137	40.5 ± 10.2 <sup>a</sup>	85.0% <sup>ab</sup>
G3 (control)	141	43.1 ± 9.8 <sup>a</sup>	80.1% <sup>b</sup>

<sup>1</sup>Means in days

<sup>ab</sup>Values followed by different superscripts, on the same column, differ (P<0.05)

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