



Injectable Trace Mineral Supplementation Increases Conception Rates in Nellore Cows Submitted to Fixed-Time Artificial Insemination

J.V. Chinaglia¹, G.F. Dos Santos¹, M. Guadagnini^{2,*}, F. Gumerindo³

1. Axiota Brazil, Varginha, MG, Brazil

2. Axiota Animal Health, 1300 Kaw Valley Rd, Wamego, KS 66547, USA

3. Universidade Federal de Mato Grosso do Sul, Campo Grande, MS, Brazil

*Corresponding author: mguadagnini@axiota.com

BACKGROUND

- An optimal trace mineral status is critical for reproductive efficiency in beef cattle.
- Injectable trace minerals (ITM) are a strategic tool to rapidly correct marginal Zn, Cu, Mn and Se status independent of dietary mineral intake or absorption.

STUDY OBJECTIVE

To evaluate the impact of injectable trace mineral (ITM) administration at the start of a fixed-time AI (FTAI) protocol on conception rates of Nellore cows in Brazil.

MATERIALS AND METHODS

- 1,182 multiparous Nellore cows from 2 farms in Mato Grosso do Sul, Brazil; enrolled December 2025.
- Extensive grazing system on tropical pasture, with *ad libitum* access to mineral salt.
- Cows randomly assigned within farm to **ITM (n=586)** or **Control (CON, n=596)**. All cows followed the same FTAI protocol; only ITM cows received the injection.

Treatment (ITM)

Zn 60 mg/mL

Cu 15 mg/mL

Mn 10 mg/mL

Se 5 mg/mL

Multimin® 90, Axiota Animal Health — 1 mL/100 kg BW, SC



FTAI PROTOCOL TIMELINE

- D0 Day 0**
P4 device + EB IM + ITM injection
- D8 Day 8**
Device removal + PGF + eCG + ECP
- D10 Day 10**
Fixed-time AI (FTAI)
- D41 Day 41**
Pregnancy diagnosis (ultrasound)

STATISTICAL ANALYSIS: BCS differences among groups were assessed by ANOVA. Differences in the proportion of pregnant cows between groups were assessed by chi-square test. A logistic regression model evaluated the association of treatment with pregnancy outcome (Pregnant vs Open), including treatment, farm, sire, BCS category (<3 or ≥3) and estrus expression (Yes/No) and their interactions as fixed effects.

RESULTS

ITM 57.7% vs CON 50.8%

Conception rate was significantly higher in ITM- vs CON-treated cows ($p=0.02$).

Mean body condition score (BCS, 1–5 scale) was 3.03 ± 0.37 and did not differ between treatment groups ($p=0.23$).

Conception rate at first-service FTAI was significantly higher in ITM- versus CON-treated cows.

Conception rate by treatment group

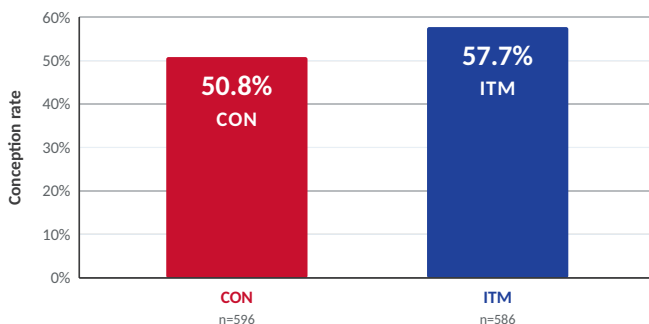


Figure 1. Conception rate at first-service FTAI ($p=0.02$).

Odds of pregnancy (ITM vs CON)

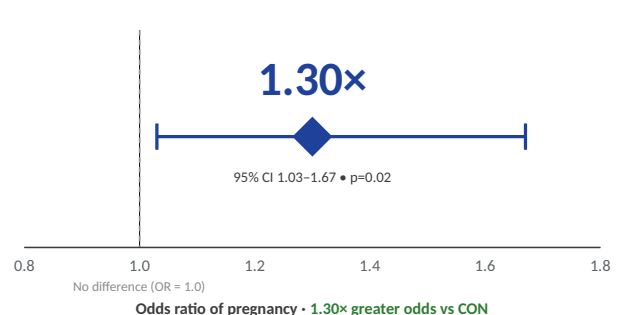


Figure 2. Odds ratio (95% CI), ITM vs CON (logistic regression).

CONSISTENT EFFECT ACROSS SUBGROUPS

Uniform ITM benefit across all evaluated variables (all interactions $p>0.10$).

Treatment × Farm
 $p=0.96$

Treatment × Estrus
 $p=0.63$

Treatment × Sire
 $p=0.73$

Treatment × BCS
 $p=0.98$

CONCLUSIONS

Administration of injectable trace minerals (Zn, Cu, Mn and Se) at the beginning of a synchronization protocol significantly increased conception rates in multiparous Nellore cows submitted to FTAI.