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IMPACT OF MASTITIS VACCINATION ON INTRAMAMMARY ANTIBIOTIC CONSUMPTION DURING THE LACTATION PERIOD ON 10 BELGIAN COMMERCIAL DAIRY FARMS

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BACKGROUND AND OBJECTIVE

Mastitis remains the most prevalent disease in dairy cattle and a major driver of antibiotic use in dairy production (Ruegg, 2017; Tommasoni, et al., 2023). In Belgium, udder health management accounts for 63% of the total antibiotic consumption on dairy farms (Lommelen, et al., 2015), and reducing antibiotic use is a major concern for all stakeholders (Ruegg, 2017; Tommasoni, et al., 2023). Preventive strategies, such as mastitis vaccination, are increasingly implemented in the field. Given the limited availability of multi-farm data evaluating the association of mastitis vaccination with antibiotic use under commercial Belgian conditions, the objective of this study was to assess the association of mastitis vaccination with intramammary antibiotic tube consumption during lactation on Belgian dairy farms.

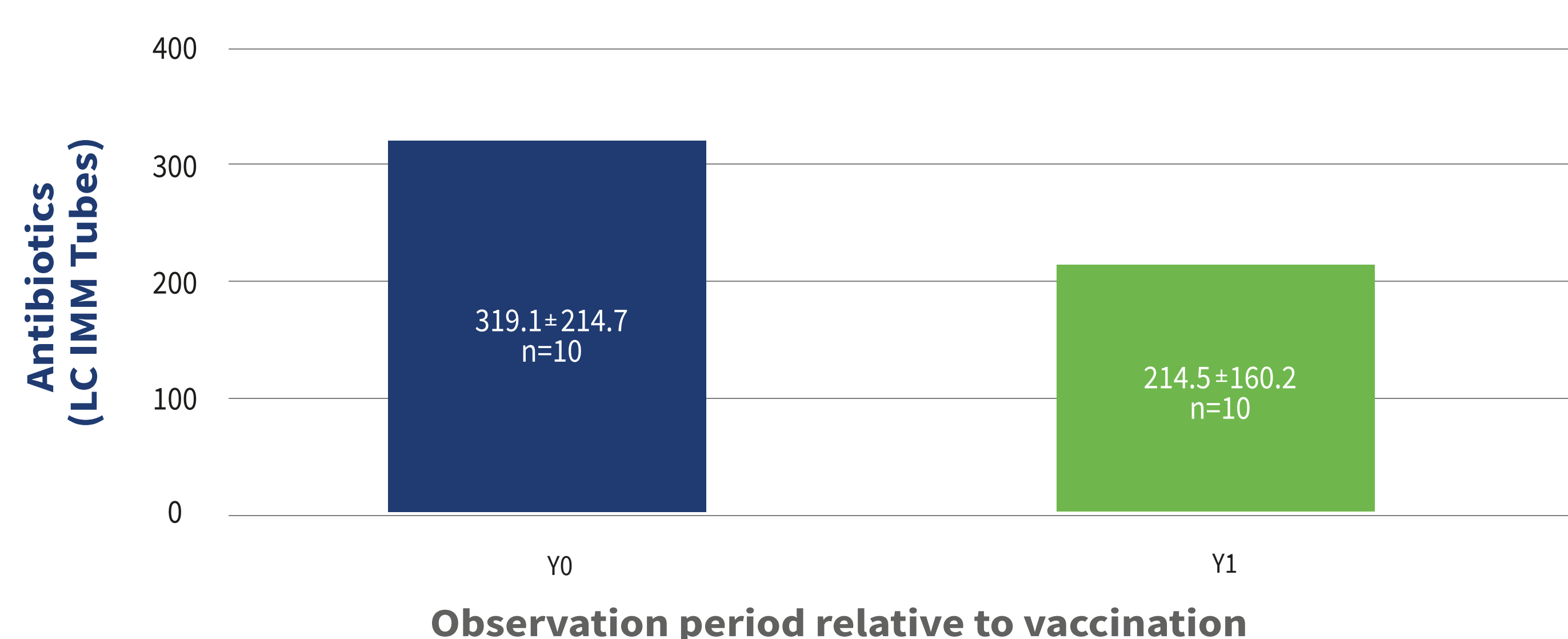
MATERIAL & METHODS

A retrospective, multi-farm observational before-and-after study was conducted across 10 Belgian dairy farms, using data from official registers on intramammary antibiotic tube use during lactation. Each farm served as its own control by comparing a 12-month pre-vaccination period (Y0) with the first 12-month period under vaccination (Y1). Vaccination was implemented under veterinary supervision using a commercially available multivalent vaccine STARTVAC® against *Staphylococcus aureus* (*S. aureus*) and *Escherichia coli* (*E. coli*) and a monovalent vaccine UBAC® against *Streptococcus uberis* (*S. uberis*), or a combination of both.

STARTVAC® (6 farms) was administered as two injections at one-month intervals, followed by booster injections every 2.5 to 3 months in lactating cows, dry cows, and heifers. UBAC® (3 farms) was administered as three injections at one-month intervals, followed by booster injections every six months. One farm used both vaccines, where booster injections followed the respective schedules of each vaccine. Intramammary antibiotic consumption during lactation was analysed as the absolute annual number of antibiotic tubes used per farm. Data were analysed using a linear regression model. Herd size data were also collected to assess whether variations in intramammary antibiotic tube consumption could be influenced by changes in the number of lactating cows.

RESULTS

The average intramammary antibiotic tube consumption during lactation decreased significantly from 319.1 (±214.7) tubes per farm per year in Y0 to 214.5 (±160.2) tubes in Y1 ($p = 0.001$), corresponding to an average relative reduction of 32.8%. All farms included in the analysis showed a reduction in absolute antibiotic tube consumption, with an average decrease of 104.6 tubes per farm per year (Graph 1).



Graph 1. Average 12-month intramammary antibiotic tube consumption per farm during lactation before (Y0) and during the first year of mastitis vaccination (Y1)

During the same period, the average herd size increased from 97.1 to 112.8 cows per farm. When adjusting antibiotic consumption to herd size, the average number of intramammary tubes used per cow per year decreased from 3.29 in Y0 to 1.90 in Y1, corresponding to an estimated reduction of 42.12%.

CONCLUSIONS

Mastitis vaccination was associated with significantly reduced intramammary antibiotic tube use during lactation on Belgian dairy farms, despite heterogeneity in systems, herd sizes, farm management practices, pathogen profiles, and vaccines. Given the multifactorial nature of mastitis, vaccination should be included within broader mastitis control programs to further improve udder health and support antibiotic reduction under field conditions.

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