MASTITIS VACCINATION AS A TOOL TO IMPROVE MILK QUALITY: FIELD STUDY IN A PORTUGUESE DAIRY FARM

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INTRODUCTION

Mastitis is a costly disease to dairy farms. Many scientific papers published around the world estimate that economic losses due to clinical and subclinical mastitis cases, average around €80 per cow. Veterinarians or consultants must have in-depth knowledge about mastitis in terms of disease, etiology, prevalence of infection, incidence of new infections, incidence of clinical mastitis cases, etc. and also about economic aspects involved. There are many different preventive tools available in order to improve milk quality and to control the various factors causing mastitis. The implantation of new preventive measures requires extra labor and the decision to make a large investment. Mastitis vaccination can be an efficacious preventive measure included in a milk quality program. Vaccination using STARTVAC® can have an influence on a dairy farm's economic situation as it was previously shown to be effective in reducing clinical and subclinical mastitis cases.

OBJECTIVE

The main objective was to use the STARTVAC® vaccine to determine its impact on mastitis epidemiology.

MATERIAL AND METHODS

The study was carried out on a farm in Portugal, with a total of 1,050 milking cows, free stall barns, with beds of mattresses and sawdust, arrangement of cubicles twice per day, cleaning of lanes with flushing, two milking parlors with 24 points each and three milkings per day. 371 cows were enrolled in this study and divided in two groups: 186 cows were grouped in the Vaccinated Group (VG) and 185 were grouped in the Control Group (CG). VG were vaccinated with STARTVAC®. The first dose of STARTVAC® was administrated in May 2011, the second dose three weeks later and the third dose three months after the first dose. All the cows were sampled twice: the first time at the start of the trial and the second one when they received the last dose in order to know the etiology of infections. Key performance indices about mastitis such as prevalence of infection, new infection rate and monthly clinical mastitis rate were recorded. All clinical mastitis (CM) cases were sampled to determine the etiology of each CM.

RESULTS

Upon starting the study, cows from VG and CG registered 96,000 and 80,000 cells/ml respectively for somatic cell count (SCC) levels. SCC average during the following four months was 111,000 in VG and 133,000 cells/ml in CG, which represents an increase of 14 and 40% respectively (Figure 1). Prevalence (P) of infection at starting in both groups was 8.3% and the P average during the following three months was 12.4% in VG and 16% in CG. This represents an increase of 33 and 49% respectively (Figure 2). New infection rate (NIR) at starting was 5.1% in both groups and NIR average during the following three months were 8.8% in VG group and 11.8% in CG group. This represents an increase of 42 and 57% respectively (Figure 3). Isolates with growth at starting in VG were 30% (10% *Corynebacterium spp.*, 18% *E. coli*, 12% *Enterococcus*, 47% coagulase negative Staphylococci (CNS) and 13% other microorganisms). In CG the positive isolates were 39% (21% *Corynebacterium spp.*, 5% *E. coli*, 15% *Enterococcus*, 47% CNS and 12% other microorganisms). Three months after, the positive isolates in VG were 65% (15% *E. coli*, 28% *Enterococcus*, 49% CNS and 8% others). In CG the positive isolates were 65% (23% *E. coli*, 25% *Enterococcus*, 48% CNS, 3% *Staphylococcus aureus* and 1% others). There was a reduction of 17% of isolates of *E. coli* in vaccinated animals and an increase of 79% of isolates of *E. coli* in non-vaccinated animals. In the VG group, 59 cows had CM in 4 months (31.8%); isolate results were 18% *E. coli*, 4% CNS, 22% other microorganisms and 56% had no growth. In CG, 90 cows had CM in 4 months (48.6%); isolate results were 18% *E. coli*, 14.4% CNS, 5.5% *Staphylococcus aureus*, 6.6% other microorganisms and 55.8% had no growth. This represents a reduction of 65% of CM cases in vaccinated animals (Figure 4).

Figure 1. SCC evolution (cells/ml).

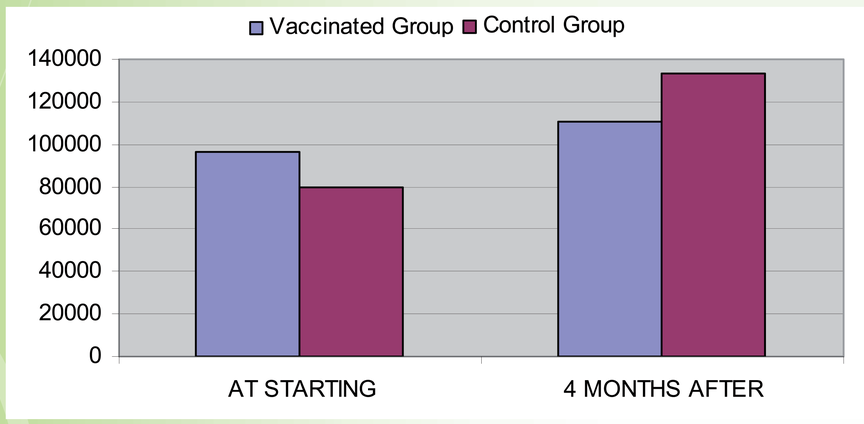


Figure 2. Prevalence of different mastitis-causing pathogens (%).

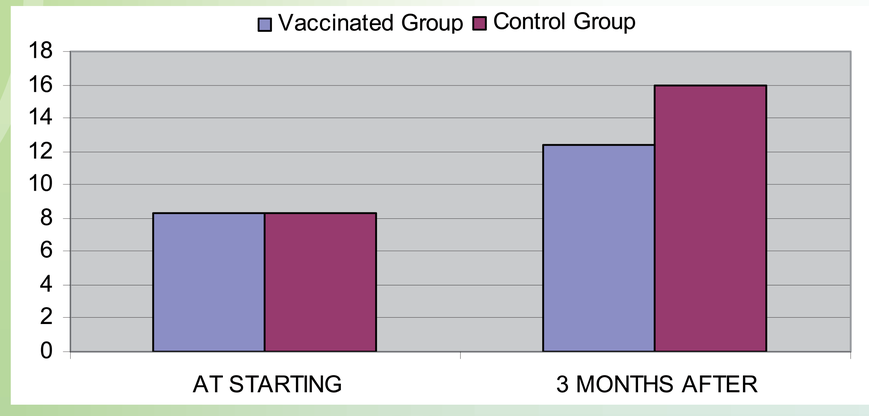


Figure 3. New infection rate (%).

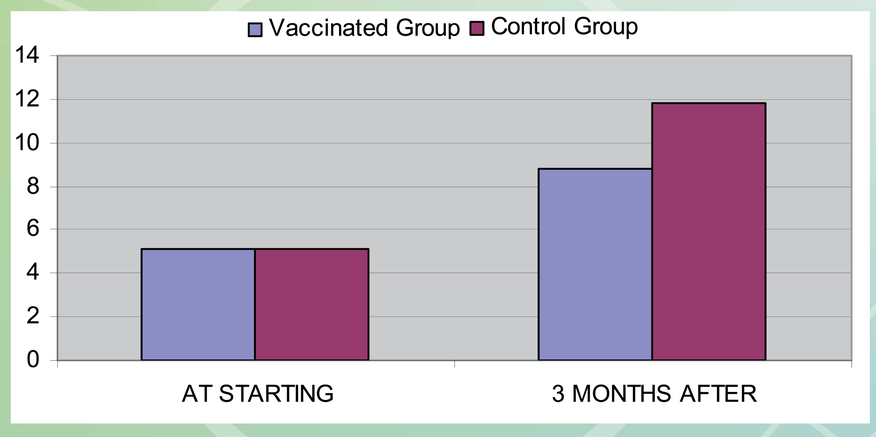
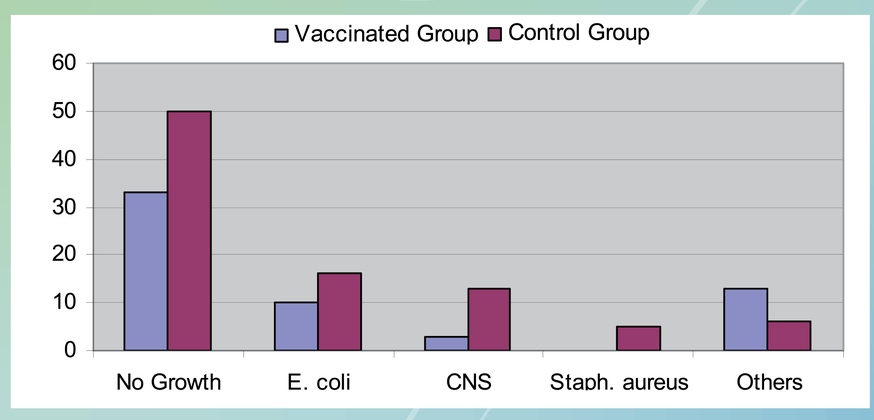


Figure 4. Clinical mastitis cases (%).



CONCLUSIONS

SCC, P and NIR were less in VG than in CG. Fewer cows remained infected by *E. coli* in VG than in CG. This decrease represents a 17% reduction in VG and 79% increase in CG. No isolates were positive for *Staphylococcus aureus* in VG. There were fewer CM cases in vaccinated animals than in non-vaccinated animals (65% reduction). No cases of CM caused by *Staphylococcus aureus* were observed in VG and fewer CM cases caused by *E. coli*, CNS in VG than in CG. STARTVAC® is an excellent tool for reducing intramammary infection and improving milk quality, and can be include as a preventive measure in milk quality programs in dairy herds.

REFERENCES

1. Hogeveen, H., K. Huijps, and T. J. G. M. Lam. 2011. Economic aspects of mastitis: New developments. N. Z. Vet. J. 59(1):16-23.