

# CASE STUDY: USE OF VACCINATION TO CONTROL BOVINE MASTITIS CAUSED BY *STAPHYLOCOCCUS AUREUS*

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## INTRODUCTION

*Staphylococcus aureus* is a major mastitis pathogen and its transmission can occur from cow to cow through milking machine liners, milkers' hands or even flies, acting like a contagious agent. *S. aureus* herd infection has a great impact on bulk tank somatic cell count (BTSCC) and costs are mainly associated to subclinical mastitis. *S. aureus* infection treatment response is low and it has the capability to develop biofilm, a virulence factor, increasing natural defenses and antibiotic resistances.

Preliminary studies have revealed efficacy from new *S. aureus* vaccine to be 50% in preventing new infections and 70% in duration of infection (Schukken, 2012).

## OBJECTIVE

The objective of this trial was to study the impact of the use of commercial *S. aureus* vaccine STARTVAC® (HIPRA) on a highly infected dairy herd.

## MATERIAL AND METHODS

The follow up was done in a dairy herd in the Northwest part of Spain, Asturias. There were 170 lactating cows, 30 L average daily milk yield and 220,000 cells/ml BTSCC on January 2011. Cows were housed in freestalls with cubicles and sand bedding, cleaned once a day and renewed once a week. Milking parlor was a 2x20 points with automatic take off. Milking routine performed was complete with pre-dipping, strip, dry, post-dipping and attach with two milkers and milking twice a day. Mastitis infection incidence was < 20%, new infection was < 10%, chronic infection was <20% and clinical mastitis was > 5% and the most predominant pathogen was *S. aureus*.

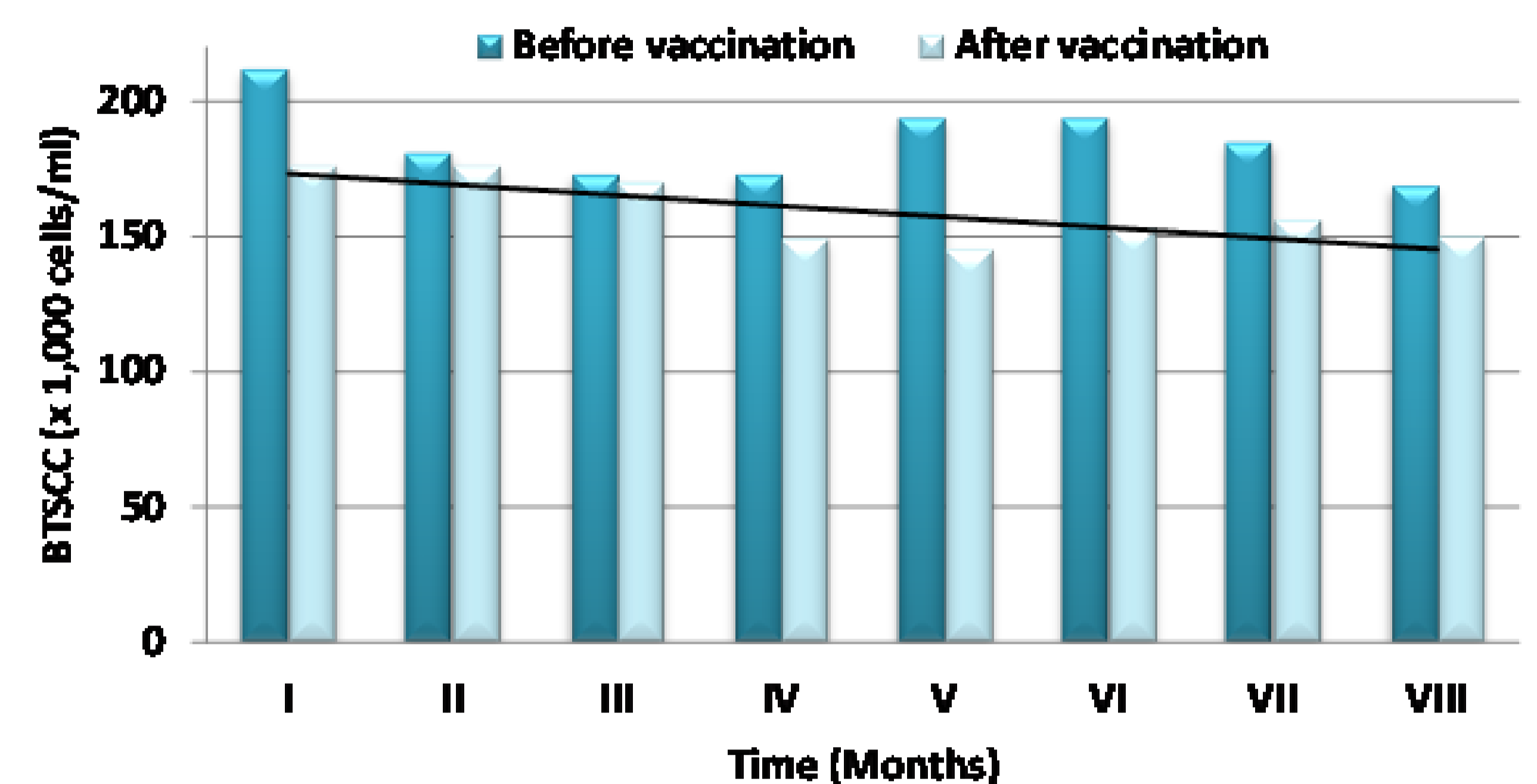
After whole herd microbiological study 54 cows were positive for *S. aureus* (31%). After milking machine evaluation vacuum was corrected for 43 Kpa and milking units changed. Positive animals were segregated and milked last. Chronic animals were also culled. All animals were vaccinated (STARTVAC®) at dry off (45d, 15d before and 52d after calving and revaccinated 4 months later) on September 2011. Positive animals were sampled after calving 7d, 21d and 65d in order to study *S. aureus* prevalence.

## RESULTS

After sampling, 37 cows were negative for the three consecutive microbiological culture tests, considered as cured and returned to the milking group; 2 cows had at least one positive and were kept in the segregated group and 17 cows were culled for different reasons e.g. metabolic disorders, laminitis, etc. and from those 17 only 4 were culled due to mastitis occurrence.

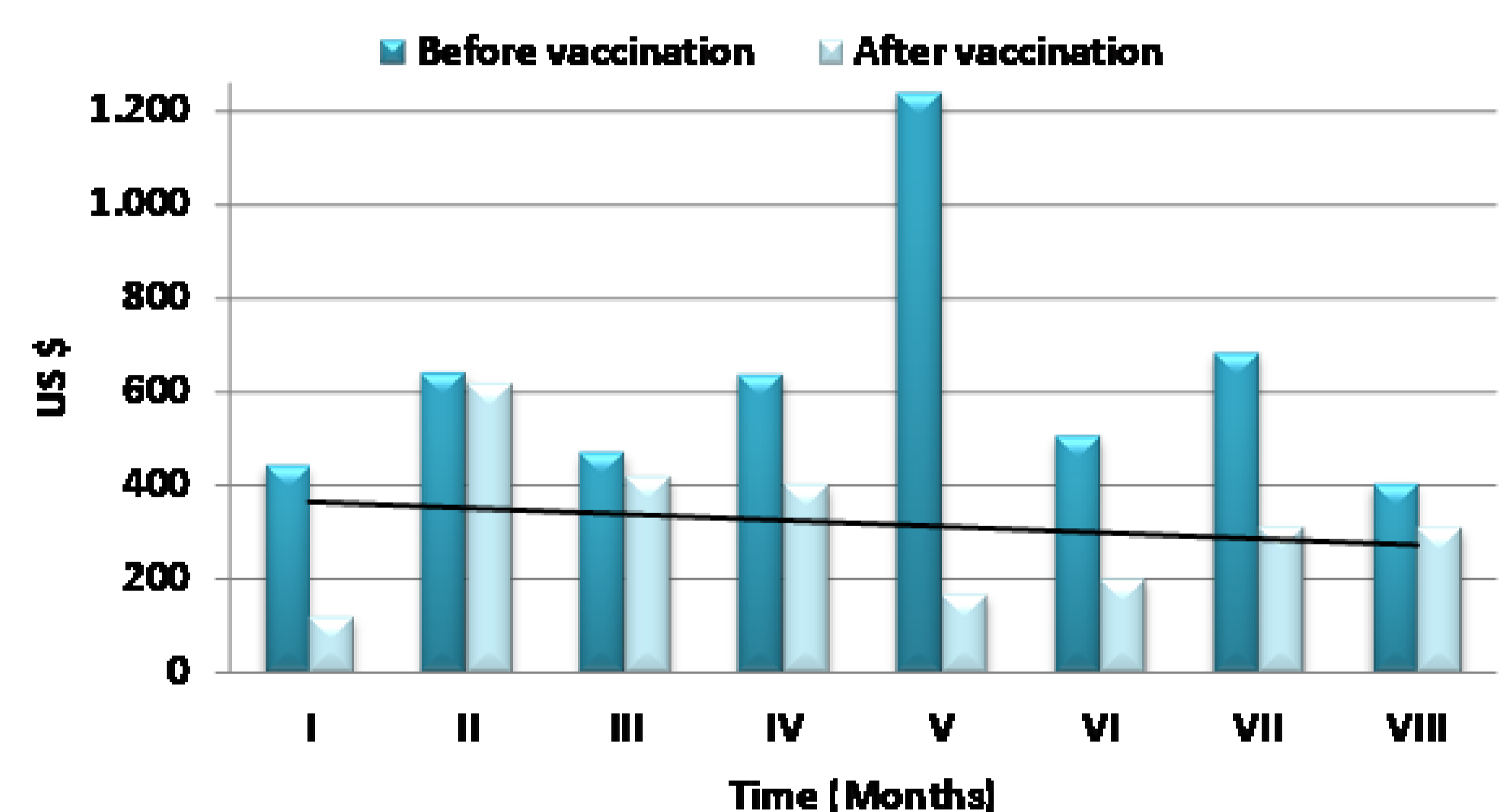
Prevalence of *S. aureus* after vaccination period decreased from 31% to 1.26%.

Figure 1. BTSCC evaluation during 8 months, homologous period, before and after vaccination.



BTSCC went down from 212,000 to 150,000 cells/ml after vaccination.

Figure 2. Treatment costs evaluation during 8 months, homologous period, before and after vaccination.



Total treatment costs before vaccination were US \$ 5.028 and after vaccination decreased to US \$ 2.550.

## CONCLUSIONS

Even though BTSCC was low (212,000 cells/ml), the herd was highly infected with *S. aureus* (31%). After vaccination period the *S. aureus* prevalence decreased and did so BTSCC. Occurrence of clinical and subclinical mastitis cases diminished as well as treatment costs.

STARTVAC® may have been effective in controlling *S. aureus* mastitis incidence and reducing treatment costs; it could be included in Milk Quality programmes in dairy herds as preventive tool.

## REFERENCES

Schukken, Y.; Moroni, P.; Locatelli, C.; Testa, F.; Scaccabarozzi, L.; Pollera, C.; Rota, N.; Casula, A.; Bronzo, V. Estimation of Efficacy of STARTVAC® Vaccination in Dairy Herds, World Buiatrics Congress Lisbon 2012.