RESULTS OF ONE YEAR PROTOCOL WITH THE STARTVAC® MASTITIS VACCINE: CASE STUDY

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OBJECTIVE

The objective of this case study was to evaluate the significance of the changes that occurred in a Portuguese dairy farm after a field trial with the STARTVAC® mastitis vaccine (HIPRA) in the following items:

1) Incidence of clinical mastitis;
2) Prevalence of the major mastitis causing pathogens;
3) Achieving bulk milk somatic cell count (BMSCC) standards required from milk processors.

MATERIAL AND METHODS

The study was carried out on a dairy farm with 76 lactating adult animals housed in free-stalls, with an average milk production of 31 L/day/cow by the time the vaccination program started. Data record is based on Segalab S. A. Milk Quality Assessment Program.

Every cow in milk at the farm has a composite milk sample collected by trained technicians and microbiological culture is preformed according to the National Mastitis Council standards (NMC, 1999). The visits are made once a year.

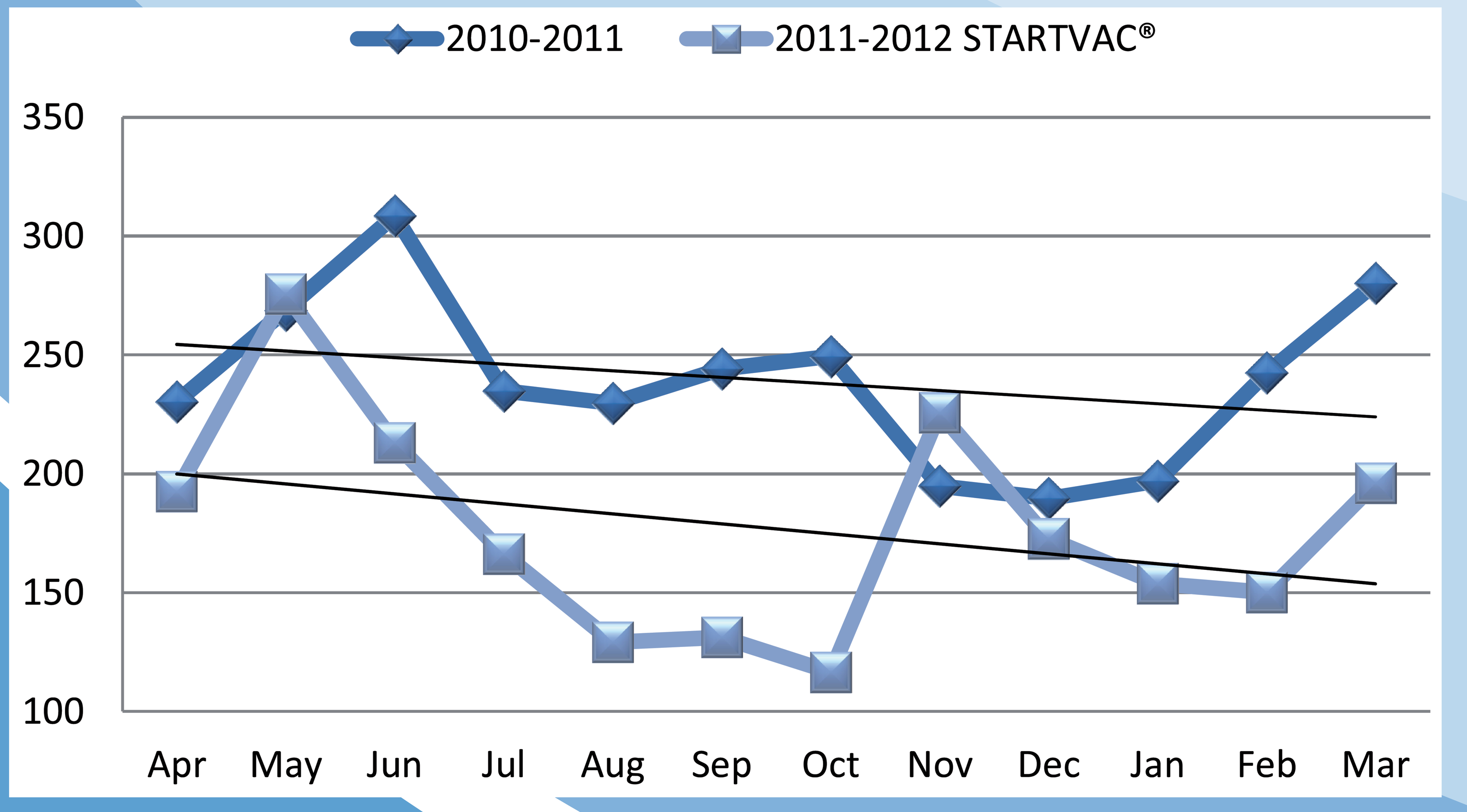
Clinical mastitis records, based on clinical signs identified by the farmer, were used to calculate incidence rate; cow-days at risk were calculated as the total number of days the cow was present in the herd minus the days in treatment till clinical cure. Multiple clinical cases within 8 days were considered the same. Statistical difference between proportions was evaluated by chi-square test. The confidence interval (CI) for the relative risk (RR) was 95%.The results from BMSCC were compared using Student's t-test and used to calculate the Process capability index (Cpk). The Cpk evaluates the global behavior of the herd udder health and combines in its calculation not only the annual average mean of BMSCC but also the annual variation values of the BMSCC (Niza-Ribeiro et al, 2004).

All adult cows as well as confirmed pregnant heifers received a first and a second vaccination with a 3 week interval and then were re-vaccinated every 3 months. Vaccination period started on May 2011 coinciding with the annual Milk Quality Assessment Program visit and one year follow up was done.

RESULTS & DISCUSSION

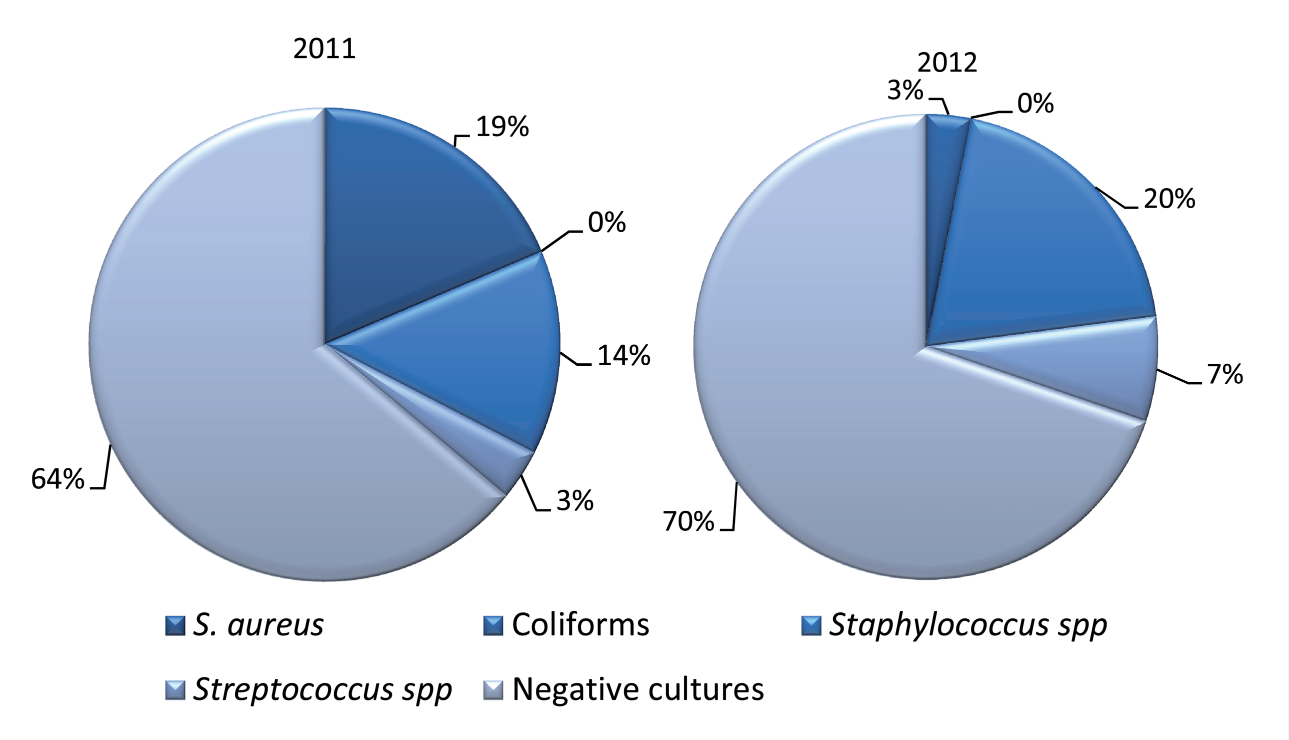
The incidence rate of clinical mastitis can be a good indicator of colimastitis evolution (Radostitis, et al 1994). Clinical cases diminished from 92 to 77 mastitis cases/100 cows/year. Several studies reported that colimastits vaccination resulted in mastitis with less severe clinical signs (Hogan et al, 1992; Hogan et al, 1995). During the year that preceded vaccination the number of systemic antibiotic treatments was 24 (42.9%) and in the year with vaccination it was 10 (18.5%): RR=2.3 (1.2-4.4).

Figure 1. BMSCC (x 1,000 cells/ml) evolution during the period previous to vaccination and one year after vaccination ($P<0.01$).



The BMSCC decrease during the vaccination period was statistically significant ($P<0.01$). Results of BMSCC as udder health indicator are often neglected because they can be influenced by milk discarding. Cpk value >1 means that the dairy farm complies with the limit of 400,000 cells/ml milk quality standards (Niza-Ribeiro et al, 2004). The two consecutive previous years to vaccination Cpk values were 1.00 and 1.14 correspondingly. One year after vaccination period Cpk value was 1.51, thanks to improved udder health status.

Figure 2. Mastitis causing pathogens prevalences during the period previous to vaccination and one year after vaccination.



Number of *Staphyloccocus aureus* (*S. aureus*) infected animals showed a significant decrease one year after starting the vaccination period (P<0,05). The reduction on the prevalence of *S. aureus* positive samples had an RR of 5.8 (1.3-24.9). This can result from culling animals or increased microbiological cure and a decreased new infection rate. From 2011, 12 *S. aureus* infected animals, 1 persisted infected in 2012, 1 was culled; another was in the dry off period and 9 apparently cured. In the year of vaccination it was detected one new *S. aureus* infected animal. As the periodic shedding pattern of chronic *S. aureus* infections lowers the sensitivity of the microbiological results, serial culture results are needed to confirm accurately *S. aureus* infection status (Sears et al, 1990), particularly when working with composite samples. For this study no duplicate samples were performed, further testing would be needed in order to confirm microbiological status.

Other present infections prevalence such as *Staphylococcus spp* seemed to suffer no influence with vaccination. The prevalence data for environmental infections was, as expected, mostly inconclusive. The proportion of negative samples, however, experienced a significant increase ($P<0.05$).

CONCLUSIONS

Results show that introduction of STARTVAC® vaccine improved BMSCC and the incidence rate of clinical mastitis, some caused by coliforms. The immunization program along with management preventive measures allowed *S. aureus* prevalence to diminish significantly with a magnitude of 5.8 to one. Mastitis vaccination can be a valuable tool in dairy herds with coliforms and *S. aureus* mastitis problems.

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