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Evolution of CMSCC in Intramammary *Staphylococcus Aureus* Infected Cows after Calving and Treated at Dry Period

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The aim of this work was to characterise the evolution of somatic cell count of mastitic cows infected with *Staphylococcus aureus* treated only at dry period. Composite milk somatic cell counts Somatic cell count (CMSCC, fossmatic) and microbiologic analysis (Plate Count Agar) were performed, at same time, in all 134 lactating cows from one dairy farm. All cows diagnosed with *St. aureus* infection were managed separately and only treated with betalactamic antibiotics at the onset of dry period. The CMSCC of first and second dairy report after calving was also used. Linear score (LS), bulk contribution (SCC %) of each animal and mean linear score (mLS; average of three last individual LS) were evaluated for each sample of composite milk. The LS was 3.4 ± 0.2 (S.E.M., $n=73$) and 1.9 ± 0.2 ($n=61$, $P<0.001$) for positive and negative samples, respectively. The correlation between LS and bulk contribution (%) were $r=0.93$ ($n=134$, $P<0.001$). The *St. aureus* prevalence was 26.9% (36/134; 49.3% of total positive samples). The bulk contribution (%) by cows with detected *St. aureus* was 38%. The mean LS of single *St. aureus* isolated samples (mLS= 3.3 ± 0.3 , $n=32$) was not different than others microbiological positive samples (mLS= 3.4 ± 0.3 , $n=41$, $P>0.05$) and both were higher than negative sampled cows (mLS= 2.0 ± 0.2 , $n=61$, $P<0.001$). The mean lactation for cows without microorganisms detection ($1.9 + 0.2$) was lower ($P<0.001$) than cows with *St. aureus* (2.6 ± 0.3) or with others microorganisms (2.7 ± 0.3) isolation. The LS and mean LS at microbiologic diagnosis time (LS= 3.7 ± 0.4 and mLS= 3.5 ± 0.3) was higher than LS at first (LS= 1.7 ± 0.4 and mLS= 1.7 ± 0.3) and second (LS= 1.9 ± 0.4 and mLS= 1.7 ± 0.3 , $n=29$, $P<0.001$) dairy report after calving. Three old cows remained with mean LS 4 in these first and second periods. In conclusion, a decrease of LS and mean LS from *St. aureus* mastitic cows was observed on next calving after a separated management and dry cow therapy.

Key words: Mastitis, St. aureus, Somatic cells, Dairy cattle



INTRODUCTION

***Staphylococcus aureus* is a primary contagious pathogen:**

- With subclinical form importance and infection is spread at milking time;
- Extremely difficult to control by treatment alone: usually poor response to antibiotic treatment is observed, and infected cows eventually must be segregated or culled from the herd (Jones *et al.*, 1998).

So, is necessary a correct management of Cows infected with *St. aureus* during the lactation and their treatment at the onset of dry period.



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Objective:

The aim of this retrospective study was to characterise the **evolution of somatic cell** count of mastitic cows infected with *Staphylococcus aureus* and **treated only at dry period.**



MATERIAL AND METHODS:

Records of all **134 lactating cows** from **one** dairy farm were used in field conditions.

For each cow the following analysis were performed before treatment at dry period:

- 1) Composite milk somatic cell counts (CMSCC; fossomatic 5000).
- 2) Microbiological analysis, at same time in all cows (Plate Count Agar).



For monthly CMSCC:

- Linear score (LS);
- bulk contribution (SCC %);
- mean linear score (mLS; average of three last individual LS)

... of each animal were used.

News CMSCC (two successive milk records) and microbiological analysis were performed after calving.

Management and treatment of microbiological (*St. aureus*) positive cows

Special management:

Separated group of infected cows, including during the dry period.

Infected Cows were milked last.

Treatment at dry period:

- Antibiotherapy

Cloxacillin + ampicillin or penicillin + streptomycin + nafcillin.

- Application of external teat sealant.



Statistical analysis:

Factorial ANOVA was used for mean comparison between infected and non-infected cows (mean \pm S.E.M.).

Repeated ANOVA was used to analysis sequential samples.

Pearson correlation was used.

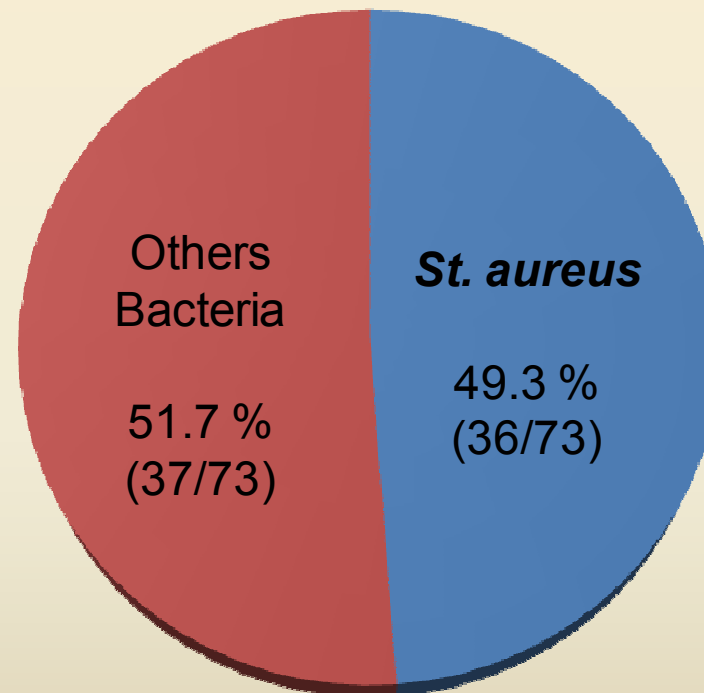


RESULTS / DISCUSSION:

Seventy-three (54.5%) cows were positive to microbiological analysis at first time:

Others significant bacteria:

- *Streptococcus agalactiae*
- *Streptococcus uberis*
- (Fungi)



Sixty-one (45.5%) cows remained negative to microbiological analysis.



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Mean lactation of infected and non-infected cows

Composite milk Samples	Mean lactation
<i>St. aureus</i> infected cows (n=36)	2.6 ± 0.3 ^a
Others infected cows (n=37)	2.7 ± 0.3 ^a
Negative cows (n=61)	1.9 ± 0.2 ^b

(a vs b: P<0.001)

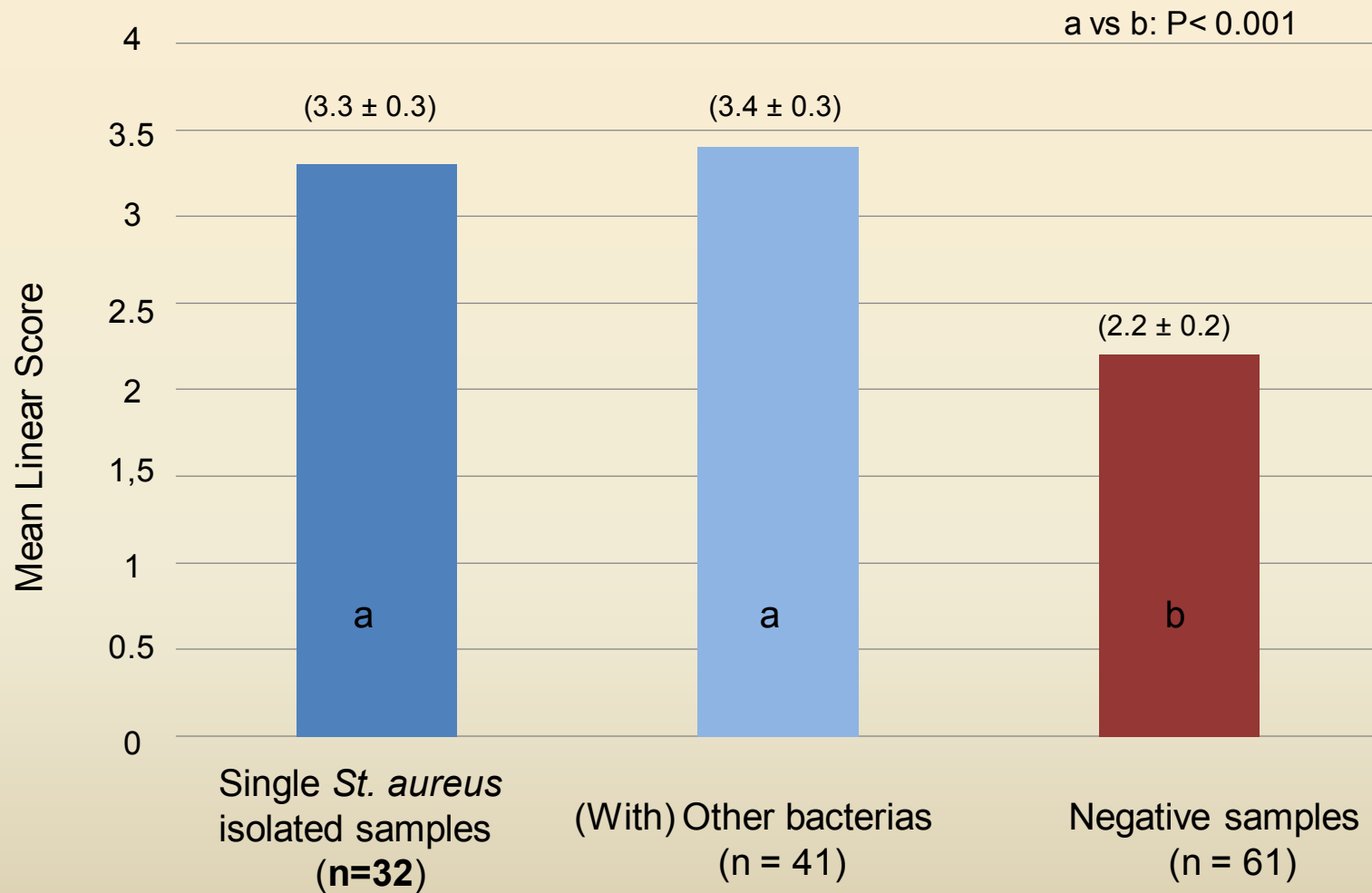
Linear Score of infected and non-infected cows

Composite milk Samples	Linear Score
Positives (n=73)	3.4 ± 0.2 ^a
Negatives (n=61)	1.9 ± 0.2 ^b

(a vs b: P<0.001)



Mean Linear Score for different milk samples at mastitis diagnosis



➤ The global correlation between LS and bulk contribution (%) was **$r=0.93$** (n=134, P<0.001).

➤ The bulk contribution (%) by all cows with detected *St. aureus* was **38%**.

Some factors found (in literature) to justify *St. aureus* IMI and they success or failure diagnosis:

- ❑ Rate of *St. aureus* infection was higher in (Zadoks *et al.*, 2001):
 - ✓ quarters that had recovered from *St. aureus* infection;
 - ✓ quarters exposed to other *St. aureus* infected quarters in the same cow;
 - ✓ bovine herpesvirus type 4-seropositive cows;
 - ✓ quarters with extremely callused teat ends.

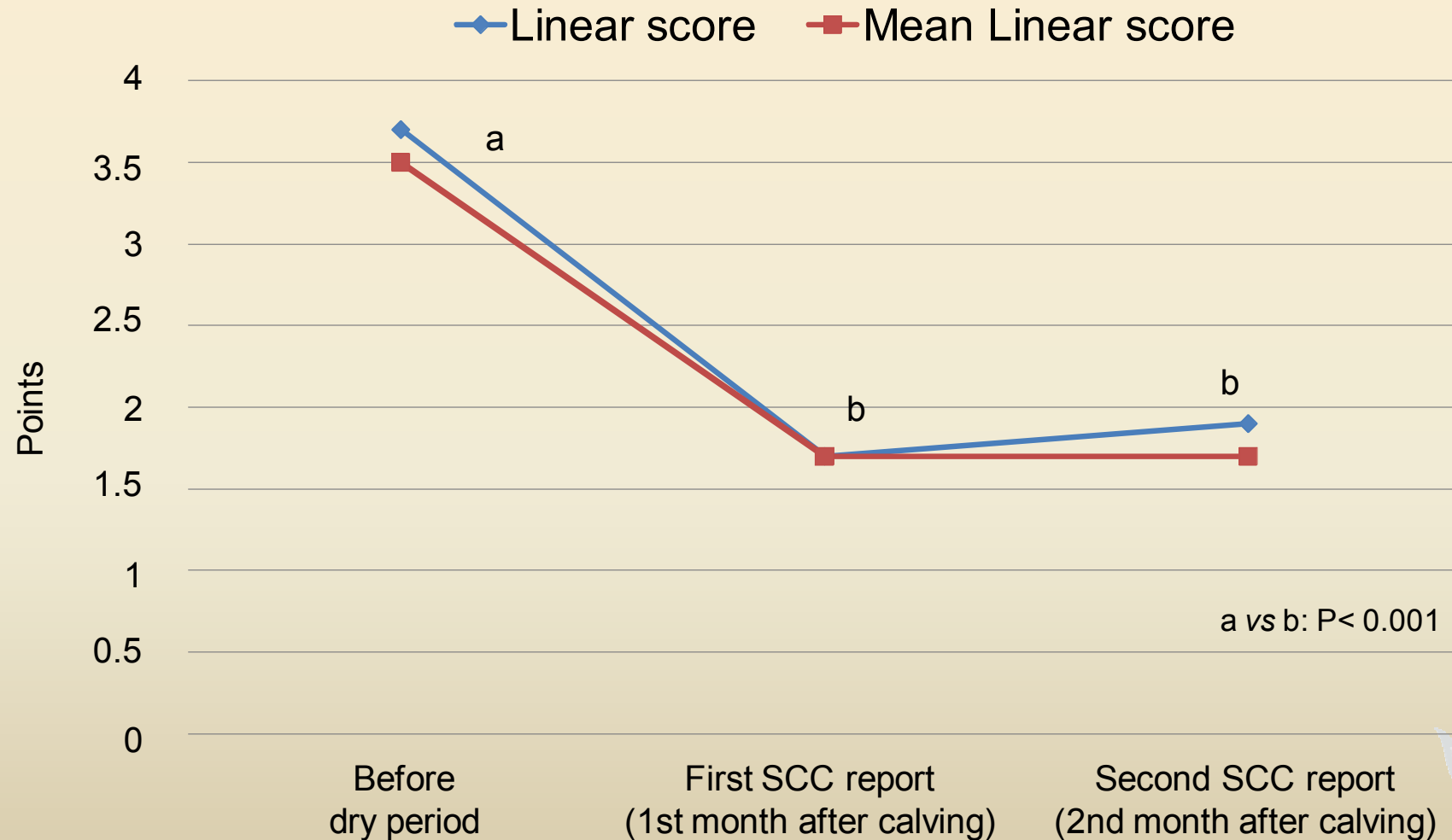
- ❑ Bacteriological culture as a diagnostic tool is not completely satisfactory (Studer *et al.*, 2008).

- ❑ Samples from composite versus quarter milk (Ribeiro *et al.*, 2008).

- ❑ Cows infected with *St. aureus* do not necessarily have high SCC (Jones *et al.*, 1998).



Linear Score and Mean Linear Score evolution (*St. aureus* IMI) before and after dry cow treatment (n=29)



CONCLUSION:

- ✓ A decrease of LS and mean LS from *St. aureus* mastitic cows was observed on next calving after a separated management and dry cow therapy.
- ✓ This suggest that this clinical management is effective in order to treat and control (individual) *St. aureus* mastitis infections.



THANKS FOR YOUR ATENTION!

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