Mastitis Diagnosis in Dairy Goats through Somatic Cell Counts and California Mastitis Test: Preliminary Results

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Abstract

The aim of this work was to evaluate somatic cell count (SCC) and California mastitis test (CMT) reliability as methods to survey mastitis in Serrana goats. Microbiological diagnosis, SCC, and CMT were performed on 2028 samples, collected from individual glands during a lactation period. According to results, CMT predictive negative value at 69.5% may be used as a cheap and practical method for subclinical mastitis survey in Serrana goats. Decision on SCC use will depend on additional research works, since its values were very high even for bacteriological negative samples.

Material and methods

Two goat blocks were used and 2028 sheep samples were performed during one lactation period.

Each sample was collected manually from half udders, chilled and kept under refrigeration, until laboratory procedures.

Microbiological diagnosis (total counts at SCC, CFU > 500 ml⁻¹ milk) and CMT were performed in the same day and SCC (kowasomatic method) after conservation (Pasteur code 3, 7°C) in all samples.

The use of geometrical mean was not possible since milk production was not evaluated.

Results and Discussion

Somatic Cell Count results are similar to others reported by Conterras et al. (1996) and Crémoux and Pouret (2000), CMT results are similar to those reported by Conterras et al. (1996) and Perrin et al. (1997). Nevertheless, the negative predictive value (CMT score 0) was lower than that reported by these authors (69.5% vs > 75.0% using CMT score 0±1), although the positive predictive value (CMT score ≥ 1) was similar (93.0% vs < 85.0%).

Mean SCC on bacteriological negatives samples were clearly higher than those reported by other authors, namely Conterras et al. (1996) < 500 x 10³ SC ml⁻¹, and the minimum threshold proposed by Crémoux et al. (1994) (750 x 10³ SC ml⁻¹).

The analysis between females along the entire lactation showed important differences, with more than 50% of the animals showing very low SCC, suggesting, theoretically, the possibility of producing milk with low somatic cell counts.

No massive difference between blocks was found (P>0.05).

This study needs to be complementary with the identification of the pathogens responsible for subclinical mastitis.

Introduction

Sub clinical mastitis in goats may be responsible for public health problems, through Protected Denomination Organic (PDO) cheeses, and certainly are important in animal health, adult and kids. The use of indirect methodologies for sub clinical mastitis survey, CMT and SCC in milk, needs previous study of its applicability in each breed (González-Rodríguez and Cármenes, 1996 and Perrin and Baudry, 1993), especially in goats. Somatic cell counts are wide very is due to different causes (Bergonier et al., 1996).

Several authors propose different thresholds and techniques for the use of SCC in predicting subclinical mastitis infections (Contreras et al., 1996, de Crémoûs et al., 1996 and de Crémoûs and Pouret, 2000) in a dynamic way.

The aim of this study was to evaluate the use of these methods (CMT and SCC) in order to achieve an efficient and quick survey of subclinical mastitis in Serrana goats, a local breed from the north of Portugal.

Results and Discussion

The relationships between microbiological diagnosis and SCC, and CMT and SCC are presented in tables 1 and 2, respectively. Negative and positive microbiological diagnoses were related to different SCC mean values (P≤0.001), although standard deviations were very high. Similar results were found between CMT scores and SCC mean values (P≤0.01). Again standard deviations were very high.

Table 1 - Relationship between microbiological diagnosis and SCC (x 10³ SC ml⁻¹)

<table>
<thead>
<tr>
<th>Microbiological diagnosis</th>
<th>SCC (x ± sd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>1270 ± 2408</td>
</tr>
<tr>
<td>Positive</td>
<td>1823 ± 2882</td>
</tr>
</tbody>
</table>

Table 2 - Relationship between CMT and SCC (x 10³ SC ml⁻¹)

<table>
<thead>
<tr>
<th>CMT</th>
<th>SCC (x ± sd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>636 ± 1322</td>
</tr>
<tr>
<td>1</td>
<td>1846 ± 1984</td>
</tr>
<tr>
<td>2</td>
<td>4035 ± 3225</td>
</tr>
<tr>
<td>3</td>
<td>8185 ± 4857</td>
</tr>
</tbody>
</table>

Conclusion

According to results, CMT may be used as a cheap and practical method for sub clinical mastitis survey in Serrana goats. The use of SCC for the same purpose will depend on additional research works, namely the individual analysis over seven animals during a lactation period.

References