Detection of *Streptococcus agalactiae* Existence within Milk Samples of Hair Goats Grown in West Anatolia Region

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**Abstract:** This study is performed to identify existence of *Streptococcus agalactiae* being mastitis factor in hair goats grown in Cine district of Aydin province in West Anatolia region. Material of the study consists of samples of 232 goat milk. Samples have been received from 116 goats of 9 herds grown in Kavsit, Tataramesler, Catuk, Ibrahimkavagi towns of Cine district. Samples have been delivered to routine diagnosis laboratory of Adnan Menderes University, Faculty of Veterinary Science, Microbiology Departments to analyze them under cold chain and in terms of *S. agalactiae*. For *S. agalactiae* isolation purposes, double inoculation of sheep blood agar of each milk sample to be analyzed has been applied. Inoculated milk samples have been left for inoculation during 24-48 h at 37°C in both aerobic and micro aerobic medium. After incubation, gram staining has been applied to milk samples shaped, gram positive cocci have been sorted and catalyze test has been applied to gram positive cocci. Catalyze negative colonies have been separated to which other chemical tests have been applied. At the end of analysis, *S. agalactiae* has been identified in 12 of 116 goats samples (10.3%).

**Key words:** Mastitis, *S. agalactiae*, identification, hair goat, raising condition, Aydin

**INTRODUCTION**

An increasing rate in goat existence and increasing demand towards goat products can be analyzed in worldwide (Morand-Fehr et al., 2004). In Turkey, raising milk goat has been rapidly increasing in recent years. One of the reason is increasing demand towards goat milk and products.

According to the studies applied on goat milks, it has been concluded that nutritional value of goat milk is higher than that of cow milk and goat milk is similar to human milk due to its higher rate of mineral materials and biological values (Belewu and Aiyeogbusi, 2002; Morales et al., 2005). Another study provided the result that food based pathogens were less in goat milks (Gutta et al., 2009). In addition, recent studies attached higher importance to isolation and identification of microorganisms that may exist within milk and having adverse impacts on human and animal health (Andersen et al., 2003; Celik et al., 2009).

Mastitis is one of the important factors causing significant economical losses in milk industry (Erksine, 1992). Causing clinical and subclinical mastitis, bacterial contamination of udder glands affect milk quality (Contreras et al., 1999). *S. agalactiae* and *S. aureus* are worldwide known clinical or subclinical mastitis factors. In goats, mastitis generally represent a subclinical pattern (Contreras et al., 1999). Subclinical mastitis caused due to *S. agalactiae* has essential qualitative and quantitative impacts of bulk tank milks (Keefe, 1997).

Economical losses caused due to mastitis can be counted as disposal of milk, treatment costs, veterinary surgeon costs, lactation in which mastitis is shaped and decrease of milk efficiency in following lactation. Many foreign studies exist regarding wide dissemination area of *S. aureus* and *S. agalactiae* among herds. Researchers found that prevalence of *S. agalactiae* in tank milks is 6-70% (Schlegelova et al., 2002; Fox et al., 2003; Andersen et al., 2003; Khaita et al., 2000; Schoonderwoerd et al., 1993; Kelton et al., 1999). In addition, some researches applied regarding existence of *S. agalactiae* among cattle and sheep and goats exists in Turkey (Bastan et al., 2008; Celik et al., 2009). However, any study regarding search of *S. agalactiae* in goats does not exist in Turkey. Routine method used in identification of *S. agalactiae* in milks is bacteriological culture. Other methods such as Latex agglutination, slide coaglutination, Enzyme Linked Immunosorbent Assay (ELISA) and Immunoflorescence Assay (IFA) are also developed. Bacterial colory cannot be easily obtained in isolation

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RESULTS AND DISCUSSION

In this study, *S. agalactiae* has been identified in 12 of 116 heads of hair goat (10.3%) whose milk samples have been received. Results obtained are shown in Table 1. According to these results, existence of *S. agalactiae* can be observed within milks of hair goats in Tatarmenisler and Kavsit towns whereas *S. agalactiae* does not exist in milks obtained from Ibrahimkavagi and Çatak towns (Table 1). Existence of *S. agalactiae* in milks of hair goats has been analyzed for the first time with this study. In addition, *Streptococcus pyogenes* (8.6%) has been isolated and identified from 10 heads of goat, *Streptococcus pneumoniae* (0.86%) from 1 head of goat, *Escherichia coli* (1.72%) from 2 heads of goat and *Plesiomonas shigelloides* (1.72%) 2 heads of goat.

Studies are applied to gain information about *S. agalactiae* based mastitis within dairy cattle at herd level as well as eliminate this matter (Andersen et al., 2003). According to a study applied in Mississippi in 1982, 39.5% of dairy cattle has been infected with *S. agalactiae* (Seers et al., 1982).

In another study, applied in Massachusetts between 1976-1982, it has been obtained that 44.7% of dairy cattle was infected (Oliver and Mitchell, 1984). A decrease has been analyzed in rate of infection according to the results of studies applied during following years. While a study performed in 1990 provided the rate of 7.9% for infected animals within herd (Godkin and Leslie, 1990), study of 1992 analyzed respective rate as 10% (Bartlett et al., 1992).

A study performed in Elazig notified that 9 of 146 isolates have been reflected *S. agalactiae* (6.16%). In addition, this study obtained following rates; *Staphylococcus aureus* 39.04%, *Staphylococcus epidermidis* 17.81%, *Actinomyces pyogenes* 14.38%, *E. coli* 8.9% and *Streptococcus uberis* 4.11%, *Streptococcus dysagalactiae* 3.42%, *Corynebacterium bovis* 1.37%, *Pasteurella haemolytica* 1.37% and *Bacillus cereus* 1.37%. In a study performed in Iran, 42 *Streptococci* has been isolated from 148 milk samples and following rates have been obtained; *S. dysagalactiae* 35%, *S. agalactiae* 26%, *S. uberis* 18%, *Enterococcus sp.* 4% (Ebrahimi et al., 2008). A study applied in Tanzania obtained following rates in herds analyzed between 1971-2002; *Staphylococcus aureus* 25.7%, *S. agalactiae*

<table>
<thead>
<tr>
<th>Study centers</th>
<th>No. of goats sampled</th>
<th>Total no. of samples</th>
<th>Right udder <em>S. agalactiae</em> positive sample rate (%)</th>
<th>Left udder <em>S. agalactiae</em> positive sample rate (%)</th>
<th>Both udders positive sample rate (%)</th>
<th>Total no. of positive goats (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kavsit town</td>
<td>46</td>
<td>80</td>
<td>4 (10)</td>
<td>3 (7.5)</td>
<td>0 (0)</td>
<td>7 (17.5)</td>
</tr>
<tr>
<td>Ibrahimkavagi</td>
<td>32</td>
<td>64</td>
<td>0 (0)</td>
<td>0 (0.0)</td>
<td>0 (0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Tatarmenisler</td>
<td>23</td>
<td>46</td>
<td>3 (13)</td>
<td>2 (8.0)</td>
<td>0 (0)</td>
<td>5 (21.0)</td>
</tr>
<tr>
<td>Çatak</td>
<td>11</td>
<td>22</td>
<td>0 (0)</td>
<td>0 (0.0)</td>
<td>0 (0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Total (4 towns)</td>
<td>116</td>
<td>232</td>
<td>7 (6)</td>
<td>5 (4.3)</td>
<td>0 (0)</td>
<td>12 (10.5)</td>
</tr>
</tbody>
</table>
15.4%, Klebsiella pneumoniae 14.3% and Escherichia coli 14.1%, Pseudomonas aeruginosa 7.5%, Streptococcus dysgalactiae 5.2% and Streptococcus uberis 4.2%. Contagious mastitis pathogens have been isolated as 45.6% of positive cultures, environmental pathogens as 48.2% and various pathogens have been isolated at the rate of 5.7%. In addition, this study obtained following rates; Candida albicans 33%, Candida guilliermondii 29%, Candida tropicalis 19%, Candida pelliculosa 19% and Trichophyton verrucosum 7% (Kivaria and Noordhuisen, 2007). Ergun et al. (2009) in their study performed in South regions of Turkey analyzed 1458 milk samples received from 729 awassi sheep and concluded following values; S. epidermidis 35.7%, Staphylococcus xylosus 1.2%, Staphylococcus saprophyticus 10.2%, Staphylococcus warneri 9.2%, Staphylococcus intermedius 7.1% and S. agalactiae 2%.

In a study realized in Lebanon, subclinical mastitis factors have been investigated in samples taken from 3472 udder lobes of 1736 awassi sheep and following values have been obtained; coagulase negative Staphylococci 17.8%, E. coli 13.6% and S. aureus and S. agalactiae 6.8% (Lafi et al., 1998). Generally, conventional isolation and identification as well as California Mastitis Test (CMT) have been used in these studies. Streptococcus sp. level has been identified in studies applied by goats in foreign countries and any S. agalactiae based mastitis has not been observed (Contreras et al., 1995; White and Hinckley, 1999).

If results of this study are compared, it may be observed that a correlation exists between E. coli (1.72%) results and results of White and Hinckley (1999) (1.6%). Streptococcus pyogenes (8.6%) and Streptococcus pneumoniae (0.86%) and Plesiomonas shigelloides (1.72%) have been first identified in goat milks in Turkey. Values for S. agalactiae (10.3%) have been obtained more than that of Lafi et al. (1998).

CONCLUSION

Identification of S. agalactiae based mastitis in hair goat herds of in West Anatolia region rating to 10.3% seems to be essential problem. Results indicate that existence of S. agalactiae in these herds can cause important production losses. Controlling factors that provide emergence of mastitis disease increasing application of udder disinfection before and after milking shall provide decrease of economical losses arisen.

ACKNOWLEDGEMENTS

This project financially supported by Adnan Menderes University Research Fund (Project no: CMYO 09-001).

REFERENCES


