Somatic cells counts: possible pathogens occurrence

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Introduction

Subclinical mastitis is considered to be one of the most important problems in dairy goats. This form of mastitis is more common in goats than clinical mastitis (Akter et al., 2020) and has a negative impact on milk production and the welfare of goats (Pirzada et al., 2016). Most subclinical mastitis is caused by coagulase-negative staphylococci (CNS), which are common environmental pathogens in goats (Tvarožkova et al., 2023). CNS are traditionally considered minor pathogens with lower pathogenicity and slightly increasing SCC compared to major pathogens (Taponen and Pyörälä, 2009). However, Leitner et al. (2012) described that SCC increased approximately 3-fold more in goats and sheep than in cows during CNS infection. **The aim of this study was to describe the prevalence of pathogens and describe the effect of pathogens on somatic cell counts**.

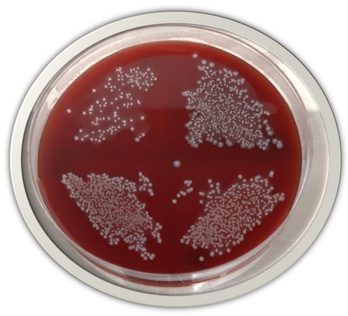
Materials and Methods

Milk samples

- family dairy goat farm located in central of Slovakia
- 68 half udder milk samples
  - for bacteriological cultivation (5 ml), aseptically collected
  - for SCC determination (50 ml)

Somatic cell analyses

- Somatice cell counts - determined by Somacount 150 (Bentley Czech, USA).
- Basis of SCC:
  - SCC1 < 500 × 10^3cells/mL
  - SCC2 ≥ 500 < 1000 × 10^3cells/mL
  - SCC3 ≥ 1000 × 10^3cells/mL



Bacteriology

- Incubated aerobically on blood agar plates (10 µl) (MkB Test a.s., Rosina, SR)
- 37^{0}C and evaluated after 24 and 48 hours
- contagious pathogens (*Staphylococcus aureus*, *Streptococcus agalactiae*) = one or more colonies
- other pathogens = five colonies
- Bacterial colonies were identified by cell morphology and by MALDI-TOF MS.

Statistical analyses

- Relationshiop between SCS – One-way ANOVA (SAS7.1, 2014)
- Multiple comparisons between groups (A-without pathogen and B- with pathogen presence) were made by applying the Tukey´s Studentized Range (HSD) Test.

$$yi = \mu + Mi + ei$$

yi – SCS
m – overall mean
Mi–fixed factor present of pathogens (two levels: A-without and B -with)
ei– random error

Figure 1.: Prevalence of pathogens in half udder milk samples in SCC groups

Results

Bacterial presence was detected in 19.12% of milk samples. All of the detected pathogens belonged to the coagulase-negative *Staphylococcus* species. The most common CNS were *S. simulans* with *S. caprae* (both 30.77%) and *S. chromogenes* (15.38%). Others detected CNS were *S. capitis*, *S. warneri* and *S. equorum* with prevalence 7.69%.

Table 1 shows that the presence of pathogens had a statistically significant effect on SCC (P<0.01). Bacterial-positive samples were found in 10 %, 50% and 37.5% in the SCC1, SCC2 and SCC3, respectively.

Table 1.:Effect of the pathogens on SCC

Pathogen presence	SCS		
	Mean	SEM	N
A-without	3.70^a	0,2285	56
B-with	5.54^b	0,5398	12

Conclusion

In conclusion, CNS are the most common pathogens that causes subclinical mastitis in goats. Overall, the effects on udder health appear to vary from CNS to CNS. Udder infection with two different CNS was associated with a higher udder response compared with infection with only one type of CNS. *S. simulans*, *S. capitis* and *S. warneri* caused slightly stronger immune responses than *S. caprae*, *S. equorum* as indicated by higher increases in SCC. Overall, CNS in goats can be considered minor pathogens, but further study is needed to better define the pathogenicity of CNS species.

Reference: Literature available at the author

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