

PCR detection of *Staphylococcus aureus* isolated from sub-clinical mastitis of goat with expression immune responses genes.

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Abstract

Objective: Goat sub-clinical mastitis is a multi-bacterial infection. The proper selection of a medicine for therapy depends on correctly identifying the bacterium. Via use of the 16S ribosomal RNA (16S rRNA) gene, the goal of this work is to quantify the gene expression of IL2 and TNF α while also identifying the phenotypic and genotypic traits of *Staphylococcus aureus* that contribute to illness. **Materials and Methods:** Utilizing 16S rRNA gene-specific universal primers for the bacterial polymerase chain reaction (PCR), 100 samples of goats with healthy and subclinical mastitis were analyzed. The expression levels of the *staphylococcus aureus* and the inflammatory cytokines interleukin (IL-2) and (TNF α) in sub-clinical mastitis and healthy animals were evaluated and compared using the primers. **Results:** According to the PCR, 70 (64.3%) samples had favorable outcomes. Sub-clinical mastitis goats had considerably higher TNF gene expression than healthy goats ($p < 0.001$). The relative gene expression in subclinical mastitis-affected animals of TNF α and IL2 is 6.2 ± 3.23 and 1.02 ± 0.311 , respectively, and the relative gene expression of these cytokines is 3.012 ± 2.12 and 3.33 ± 0.821 , respectively.

Keywords

goat Mastitis, *Staphylococcus aureus*, Cytokines and pro-inflammatory

Mastitis, a swelling of the gland that produces milk, typically results from an intra-mammary bacterial infection. (Kibebew 2017, Pal, Regasa et al. 2019). Depending on the severity of the inflammation, phases of clinical mastitis can also be divided into subacute, acute, and acute phases. (Ibrahim 2017). When opposed to clinical mastitis, the incidence of subclinical mastitis (SCM), which doesn't cause obvious changes to the milk's or udder's appearance, is substantially higher in a dairy herd (Shaheen, Tantary et al. 2016, Cheng and Han 2020). This illness is characterized by inflammation of the mammary gland, which can be triggered by germs, most frequently bacteria that cause tissue loss, as well as by physical, chemical, or traumatic stress (Bae, Jeong et al. 2017, Shoaib, Aqib et al. 2021). Along with these

impacts, producers will experience economic loss as a result of inadequate milk quality and reduced milk output. In most cases, bacterial infections are what cause mastitis (Pleguezuelos, Fern et al. 2015, Gelasakis, Angelidis et al. 2016). The most prevalent microbe among the many varieties recovered from instances of animal mastitis are *Staphylococci* (*Staphylococcus aureus*), *Streptococci* (*Streptococcus agalactiae*, *Streptococcus dysgalactiae*, *Streptococcus uberis*), in addition to relatives *Enterobacteriaceae* (*Escherichia coli*, *Klebsiella pneumoniae*) also other. Least prevalent causal factors include *Pseudomonas aeruginosa*, *Mycobacterium* species, *Nocardia asteroides*, *Candida* species, *Cryptococcus* species, and *Aspergillus* species. Occasionally are viruses thought to be responsible for mastitis in cattle.