

## **ALTERATION OF INFLAMMATORY FACTORS AND MILK PROTEINS DURING SPONTANEOUS AND ENDOTOXIN-INDUCED MASTITIS**

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Gene expression and protein concentration of immunologically relevant factors (i.e. arachidonic acid metabolites, cytokines and antimicrobial defense proteins) and milk proteins during endotoxin-induced and spontaneous subclinical mastitis were investigated. Mastitis was induced by lipopolysaccharide (LPS) and the mRNA expression in mammary tissue of immunological factors as well as of milk proteins was measured during the acute phase. Five healthy lactating cows were intramammarily infused in one quarter with 100 µg *E.coli* endotoxin and the contralateral quarter with saline serving as control. Mammary biopsy samples of both quarters were taken immediately before and at 3, 6, 9 and 12 h after induction of mastitis. mRNA expression in mammary tissue of most immunological factors with exception of insulin-like growth factor-I changed within hours after LPS challenge. In LPS-treated quarters tumor necrosis factor- $\alpha$  and cyclooxygenase-2 mRNA expression increased to highest values at 3 h after LPS challenge. Lactoferrin (Lf), lysozyme and inducible nitric oxide synthase mRNA expression increased and peaked at 6 h after challenge while platelet-activating factor acetylhydrolase mRNA increased only numerically. In contrast mRNA of 5-lipoxygenase showed a decrease in LPS-treated as well as in control quarter. mRNA expression of  $\alpha$ -lactalbumin decreased in both quarters and that of  $\kappa$ -Casein only in the LPS-treated quarter whereas the other milk proteins did not change significantly within 12 h after LPS challenge. mRNA expression of immunological factors were determined in milk cells and concentration of milk proteins also at a protein level during spontaneous mild subclinical mastitis. All immunological factors showed a rise of mRNA expression in milk cells comparing L (< 150,000 cells/ml) and H quarters (from 150,000 to 300,000 cells/ml). In contrast their mRNA expression was not significantly different between groups in mammary tissue. Compared with milk from L quarters, milk from H quarters showed a significantly elevated total protein content as well as an elevated content of whey protein and Lf concentration in milk. Significant differences in mRNA expression of milk proteins in tissue material were found only for  $\kappa$ -Casein which was significantly smaller in H than in L quarters.