

Cytokine gene expression in the mammary gland parenchyma of dairy cows infected with staphylococci

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Mastitis

- ❖ Coagulase-positive (CoPS) and coagulase-negative staphylococci (CoNS) are common cause of the bovine mastitis
- ❖ Infection takes place during milking (insufficient hygiene of milking equipment and milker's hands)
- ❖ Microorganisms (eg. bacteria) colonize the udder, multiply and produce harmful toxins

Aim

Analysis of expression of the cytokine genes:

- Interleukin 8 - *IL8*
- Interleukin 18 - *IL18*
- Interleukin 1 β - *IL1 β*
- C-X-C motif chemokine ligand 5 - *CXCL5*
- Tumor Necrosis Factor α - *TNF α*
- C-C Motif Chemokine Ligand 2 - *CCL2*

in the mammary gland parenchyma infected with CoPS or CoNS

Material and methods

- 51 quarter samples were collected from 40 Polish Holstein-Friesian cows of Black-and-White variety
- Three groups of samples were distinguished:
 - infected with CoPS (N=25)
 - infected with CoNS (N=13)
 - infection-free (N=13)
- Gene expression analysis using qPCR techniques (LightCycler480, Roche)
- The Glyceraldehyde-3-Phosphate Dehydrogenase (*GAPDH*) was used as a reference

Results

- There were no differences in *TNF α* , *IL1 β* and *CCL2* gene expressions

- ❖ mRNA levels of *IL8*, *IL18* genes (pro-inflammatory cytokines) were increased when the inflammatory state occurred
- ❖ mRNA level of *CXCL5* gene (recruiting and activation leukocytes) was also increased during inflammation in the mammary gland
- ❖ The coagulase-negative staphylococci are considered as environmental bacteria, however, both types of staphylococci cause the inflammation in the mammary gland

Cytokines

- ❖ Glycoproteins participating in both anti-inflammatory and pro-inflammatory processes
- ❖ They can selectively stimulate a cellular or humoral response



photo by Ewelina Kawecka

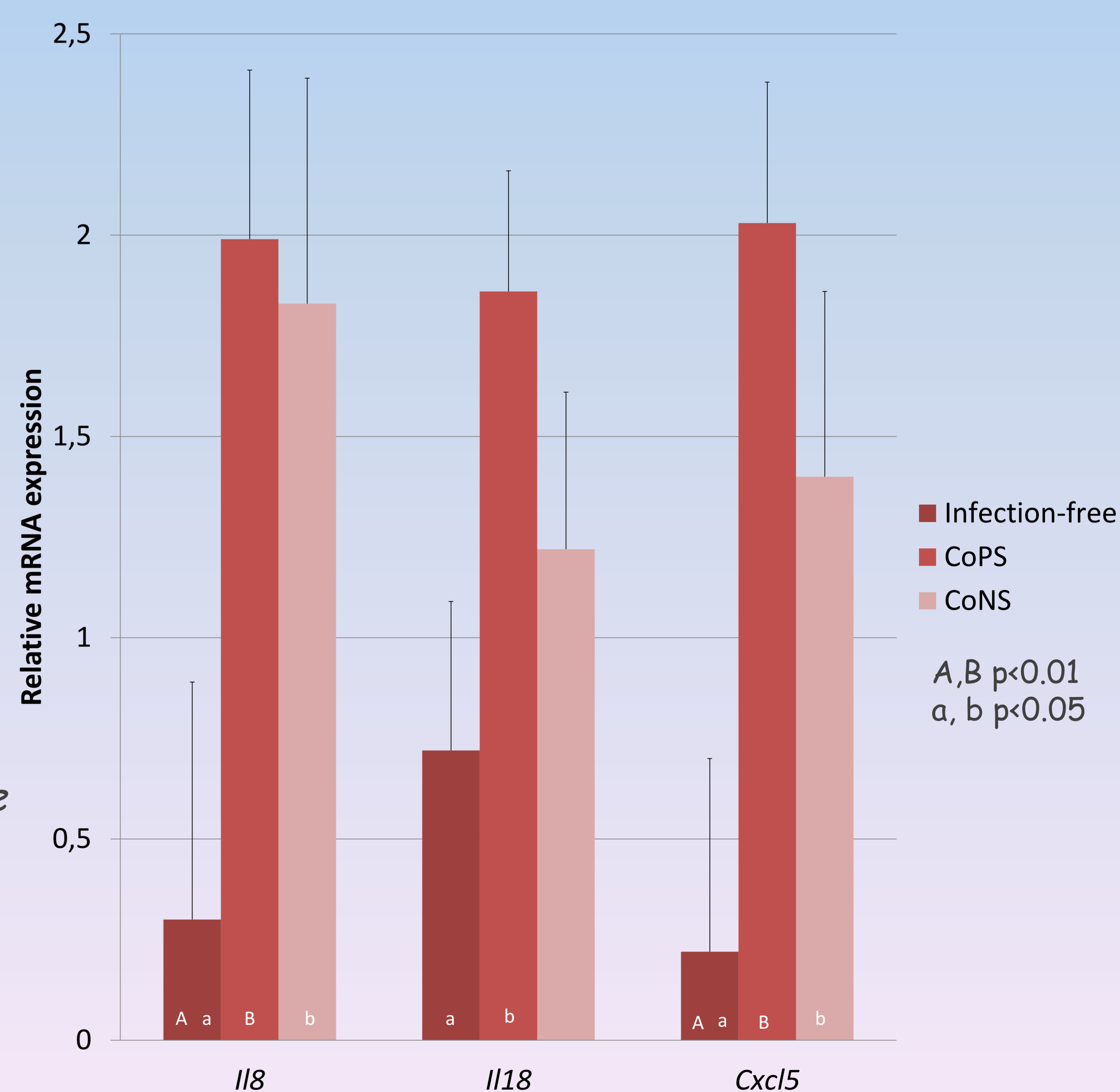


Fig.1. mRNA levels of *il8*, *il18*, *cxc15* genes in mammary gland parenchyma infected with CoPS and CoNS. Different letters indicate significant differences - A,B at $p < 0.01$; a,b at $p < 0.05$

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