

## **Inhibition of in vitro growth of mastitis pathogens by new *Lactobacillus* isolates of mammary gland in lactating dairy cows**

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### **Background:**

In dairy cow mastitis is a big problem. Protection of udder from pathogens is challenge for dairy industry. For mastitis prevention and treatment dairy farmers routinely use antibiotics, which is neither efficient nor safe<sup>1,2</sup>. Though there are too few alternatives for mastitis prevention and treatment, application of probiotics is the most promising alternative<sup>1,2</sup>. there is countless information on *Lactobacilli* in milk, but the information on the probiotics versus mastitis bacteria is rare.

### **Objectives:**

1) To assess the antagonistic properties of *Lactobacillus* strains isolated from milk of healthy dairy cows against the most common mastitis bacteria; 2) to enhance udder's innate immunity in immunocompromised dairy cows.

### **Methods:**

Milk samples of dairy cows were collected for cytobacteriological analyses. Bacterial colonies were identified; further analyses in anaerobic conditions were done using MRS media; to confirm the *Lactobacillus* strains, api 50 CH test system were then performed on the colonies. The ability of the *Lactobacillus* strains to inhibit the growth of pathogens was investigated. The *Lactobacilli* were incubated after overnight growth, and co-cultured with pathogenic *Staphylococcus aureus* and *Escherichia coli*. After 48 h, bacterial counts of the pathogens and of the *Lactobacilli* were performed.

### **Results:**

The *Lactobacillus* was identified as *Lactobacillus fermentum*; it strongly inhibited growth of both pathogenic *E. coli* and *S. aureus*. Moreover, the presence of the pathogens did not affect the growth of the *L. fermentum*.

### **Conclusion:**

Depending on status of cows, the *L. fermentum* is found in the milk and cow's environment. Huge decrease in pathogen growth in co-cultures of *L. fermentum* and *S. aureus* (as a super bug for contagious mastitis) and of *L. fermentum* and *E. coli* (as a super bug for environmental mastitis) strongly supports the idea of *L. fermentum* application as a good probiotic to prevent mastitis in immunocompromised dairy cows.

### **References:**

1. Burvenich, C, Van Merris V, Mehrzhad J, Diez-Fraile A, Duchateau L, Severity of *E. coli* mastitis is mainly determined by cow factors. *Veterinary Research* (2003), 34, 521-562
2. Mehrzhad, J, Duchateau L, Burvenich C, High milk neutrophil chemiluminescence limits the severity of bovine coliform mastitis. *Vet. Res* (2005), 36, 101-116

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