

Identification and differentiation of mastitic associated Streptococcus spp. and related bacteria by FTIR – spectroscopy

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Mastitis is still one of the most common diseases in dairy cattle causing the biggest economic losses in the dairy industry. Reduced milk yield and lower milk quality are responsible for substantial problems in the production of milk products. The infection of the bovine udder also constitutes a considerable food hygienic problem because of the growth of pathogenic organisms. One of most relevant pathogens in raw milk is *Streptococcus agalactiae* that is responsible for elevated somatic cell counts (SCC) without clinical signs of mastitis. Hence, the possibility exists that such milk enters the food chain and can initiate noxious effects to humans.

The differentiation of *Streptococcus* species, especially of *Sc. uberis*, *Sc. dysgalactiae* and *Sc. agalactiae*, is very difficult because of their close phylogenetic relationship. The identification of Streptococci by means of traditional microbiological methods is extremely time – consuming, requires increased efforts and the results are often equivocal. Commercial biochemical systems, like the API 20 Strep system (bioMérieux), also frequently provide unreliable identification due to biochemical strain variability and/or limited databases [1]. For instance, *Aerococcus* spp., *Enterococcus* spp. and *Lactococcus* spp., gaining noticeable influence on bovine intramammary infections [2], are not covered by this system. Rapid and efficient techniques for the reliable identification and differentiation of mastitis associated Streptococci and related bacteria are therefore urgently needed.

Fourier Transform Infrared (FTIR) Spectroscopy might represent interesting and promising alternatives for mastitis diagnostics. Within the scope of a PhD thesis an identification systems based on FTIR spectra and artificial neural networks (ANNs) to distinguish very closely related *Streptococcus* spp. and related bacteria is currently under development. First preliminary results show that, in principle, FTIR has the potential for identification and differentiation of the mastitis associated Streptococci and their close relatives.

References

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