Diagnosis and characteristics of contagious mastitis caused by *Staphylococcus aureus* and *Streptococcus agalactiae*

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With rapidly increasing herd sizes, focus on contagious udder pathogens becomes important. Based on a yearly test of bulk tank milk in Danish dairy herds, the prevalence of herds infected with *Streptococcus agalactiae* (*S. agalactiae*) increased from 2 % in 2000 to 7 % in 2010, while approximately 90 % of the herds were positive for *Staphylococcus aureus* (*S. aureus*) (Katholm, et al., 2012). The reemergence of *S. agalactiae* raises concerns. Early and valid diagnosis is necessary to control the spread of contagious mastitis pathogens within herds. Since 2009 the real-time PathoProof™ Mastitis PCR Assay is routinely used, mainly on composite samples taken non-aseptically at milk recording from individual cows pre-dry-off or from whole herd screenings.

Two studies were carried out in 13 problem herds to investigate the diagnostic value of PCR tests taken at milk recording for diagnosis of intramammary infections (IMI) with *S. agalactiae* and *S. aureus*, to investigate carry-over effects between consecutively milked cows and the effect of teat preparation on the PCR test results.

The PCR test had a higher sensitivity (Se) to detect *S. aureus* and *S. agalactiae* than bacteriologic culturing (Mahmmod et al. 2013a, Cederlöf et al. 2012). Se of the PCR test increased with increasing cycle threshold (Ct) value cut-off, whereas the Se for bacteriologic culturing decreased. These changes indicate changes in the underlying disease condition from ‘pathogen positive’ at high Ct-value cut-off to ‘shedding high amounts of pathogen/being truly infected’ at low Ct-value cut-offs. Pre-sampling procedures including teat disinfection reduced the odds of being PCR positive for *S. aureus* (OR 0.75, Mahmmod et al. 2013b), but not for *S. agalactiae*. To reduce the risk of false positive PCR results, we recommend proper hygiene and teat disinfection before sampling. Carry-over in terms of correlated PCR results of cows milked consecutively occurred (Mahmmod et al. 2014). Thus, samples should preferable be taken aseptically, especially if information on the milking order and the infection status of the previously milked cow is not available.

The most common strains in Danish dairy herds belong to sequence types (STs) that are also commonly found in people (Zadoks et al. 2011). To investigate molecular and strain specific characteristics, isolates of *S. agalactiae* from 6 herds were characterized by pulsed-field gel electrophoresis (PFGE) and multilocus sequence typing (MLST). The results indicated that STs belonged to a single clonal complex (CC) and that infections caused by CC23 were associated with significantly lower bacterial load in comparison to CC1 and CC19 (Mahmmod et al. 2015). In all herds infected quarters with a somatic cell count lower than 200,000/ml milk were found, which strengthens the importance of whole herd screenings and discourages the use of pre-screening SCC thresholds.

References
Mahmmod et al. 2015 doi:10.3168/jds.2015-9397