Coagulase-negative staphylococci – contagious or environmental?
Outline of two ongoing studies

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Introduction: In many European dairy farms that have adopted the 10-point mastitis prevention program, coagulase-negative staphylococci (CNS) have become the predominant pathogens found in milk samples. The fact that CNS are found as protective commensals on teat apices but also in milk samples from cows with or without elevated somatic cell counts (SCC) or clinical mastitis, emphasizes that it is a heterogeneous group of bacteria, of which some are presumably clinically important and others are not. Two studies are presented, both using accurate molecular techniques, aiming to elucidate part of the role and epidemiology of CNS at the species and strain level from both environmental and contagious viewpoints.

Materials and Methods:

Study 1: Focus on relevance and contagious transmission In order to clarify the epidemiology and importance of different CNS species as cause of rise in SCC or of clinical mastitis, or as protective organisms, a longitudinal study on 3 Flemish dairy herds is conducted. Milk samples are collected monthly during a 12 month period for bacteriological culture and SCC determination at the quarter level. Relevant information on cow and quarter level (BCS, teat apex condition…) is gathered in order to determine risk factors for infection with the biologically most relevant species. Additional milk samples are taken at special events (clinical mastitis, drying-off, calving, culling). Once during the study period, swabs are taken from the milking liners, teat apices, and milkers' hands. CNS species are differentiated by tRNA-intergenic spacer PCR. Of the biological most relevant species, strain typing will be performed to identify chronic and transient infections, the share of the milking process in the transmission of CNS from cow to cow, as well as other relevant topics.

Study 2: Focus on significance and prevalence of environmental CNS species

In a second study conducted on six Flemish dairy farms, distribution of CNS species in the farm environment and their respective clinical relevance will be studied. Milk samples from 10 randomly selected cows per farm as well as environmental samples are taken monthly for isolation of CNS during a 12 month period. Important factors on cow and quarter level like SCC, BCS, teat apex condition, teat cleanliness and visible signs of lameness will also be determined monthly. A genetic fingerprinting technique, Amplified Fragment Length Polymorphism (AFLP), will be used for species identification and strain typing of CNS. This epidemiological study on CNS isolates from environment and milk samples will help to gain more knowledge on these important etiological agents for IMI and to trace possible reservoirs for infectious CNS species on the farm. Correlations between CNS species, raise in milk SCC and overall udder health will be further elucidated. Important risk factors concerning cow, quarter and environment will be determined by linking the monthly observations with bacteriological and epidemiological data.

Conclusions to be drawn: The epidemiology of CNS species will be elucidated with an emphasis on both contagious transmission and infections acquired via the environment. Longitudinal follow up of cows and quarters will help to elucidate the relevance of infection with CNS species and strains. Identification of cow and quarter level risk factors of the biologically most relevant species will give insight in the epidemiology of CNS and will help to formulate preventive strategies against CNS infections, if, at all, necessary.