Staphylococcus aureus transmission and control in a robotic milking herd

Robotic or automated milking systems (AMS) are being introduced in the United States as an alternative to conventional milking. Investment in AMS appears to offer a number of advantages, especially with regard to reducing labor costs and shifting labor activities from the repetitive physical task of milking to upper level farm management. *Staphylococcus aureus* is a major cause of chronic intramammary infection (IMI) in dairy cows and is spread from infected to susceptible cows by contamination of the milking equipment. The objectives of this study are to understand transmission dynamics of *S. aureus* IMI through monthly whole herd sampling of a large AMS herd over 6 months as compared to known transmission dynamics of *S. aureus in conventional milking herds*. *S. aureus* isolates were identified by standard bacteriology of quarter level samples and confirmed by PCR amplification of the thermonuclease gene. Selected isolates were then strain-typed using multilocus sequence typing (MLST). Cephapirin sodium was administered once daily for 5 days to treat selected cases of subclinical *S. aureus* mastitis. Transmission parameters (β) were estimated from a generalized linear model based on the observed number of new IMI events in each monthly interval. A single strain of *S. aureus* was associated with cases of subclinical and clinical mastitis in the herd and incidence of new IMI appeared to be a function of prevalence, consistent with contagious transmission. Intramammary cephapirin treatment of subclinical mastitis cases resulted in 79% cure and contributed to reductions in prevalence. Transmission parameters of this strain are similar to those seen in conventional milking herds that apply post-milking teat disinfectant, suggesting that the AMS system maintains milking hygiene that is consistent with conventional milking systems.