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Prevalence of Methicillin Resistant *Staphylococcus aureus* in Bulk Tank Milk of Minnesota Dairy Farms – Significance and Risk Factor Analysis

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Methicillin-resistant *Staphylococcus aureus* (MRSA) has become increasing recognized in livestock particularly in swine farms in the European Union. Very few studies have investigated the prevalence of MRSA in dairy farms in the United States. The current study was undertaken to determine the prevalence of MRSA in dairy farms around Minnesota. Farm prevalence of *S. aureus*, including MRSA, was estimated from bulk tank milk (BTM) samples and isolates were characterized genotypically and phenotypically. BTM samples were sampled in duplicate and a total of 150 pooled BTM samples from 50 farms spanning 3 seasons (spring, summer and fall in 2009) were collected. MRSA isolates were further genotyped using MLST, PFGE and staphylococcal protein A *(spa)* typing. The prevalence of *S. aureus* was: 62% while that of MRSA was: 1.3%. Antibiotic susceptibility testing of all isolates revealed 15 multi-drug resistant (MDR) *S. aureus* and confirmed the 2 MRSA isolates. Seven isolates including the two MRSA isolates produced staphylococcal enterotoxins B, C, D and E on overnight culture in nutrient media. Of the 2 MRSA isolates, one had a composite genotype profile of - ST 5-USA 100- spa 2 type (ridom unknown) which has been reported among hospital associated-MRSA, while the second isolate carried - ST 8-USA300-t121 genotype commonly identified amongst community associated-MRSAs. These results suggest that MRSA genotypes associated with hospitals and community can be found in MN bulk tank milk, though at a very low prevalence. Furthermore, the presence of enterotoxin genes and production of heat stable toxins by these isolates poses a potential food intoxication risk to humans.