***summarizes the project’s expected importance or its economic, environmental, and/or social impact***

Variation in distribution and diversity of *Staphylococcus* species causing intramammary infections in dairy cattle is associated with different management practices. The objective of the current study was to identify which *Staph.* species are most relevant to udder health for organic dairies, by exploring how quarter somatic cell count (SCC) varied as a result of infection with the most commonly-isolated species. SCC was higher in quarters infected with 9 of the 10 *Staph.* species vs. negative quarters. Although the increase in SCC was modest for most species observed, their widespread nature can still result in sizeable increases in bulk tank SCC.

***Below is 373 words***

Variation in species distribution and diversity of non-aureus staphylococci and mammaliicocci (NASM) species causing intramammary infections (IMI) in dairy cattle is associated with different management practices. Disparate selective pressures on organic dairies could potentially result in population differences of these mastitis-causing bacteria. No previous studies have identified which NASM species are most relevant to udder health for a population of certified organic dairies.

The current study presents data from a longitudinal, cross-sectional study of 10 certified organic dairy farms. The objective was to estimate how quarter somatic cell count (qSCC) varied as a result of infection with the most commonly-isolated NASM species. Aerobic culture of quartermilk samples to identify IMI was conducted in parallel with determination of qSCC. A linear hierarchical repeated measures mixed model was used to compare somatic cell scores associated with quarters identified to have IMI with a given *Staphylococcus* species to culture negative quarters, and included number of days in milk at time of sampling to adjust the estimates of the *Staph.* species and qSCC association.

The final data set consisted of 648 quarters with an IMI due to 10 different *Staph.* sp. and 1,972 culture negative quarters. *S. chromogenes* was the most commonly-found species, followed by *aureus, haemolyticus,* and *simulans.* A large amount of variability was observed in the somatic cell score for culture negative quarters and those infected with a number of different *Staph.* species, especially *S. chromogenes* and *aureus.* Somatic cell score was significantly higher in quarters infected with *S. agnetis, aureus, chromogenes, devriesei, haemolyticus, hyicus, simulans, warneri, and xylosus* compared to uninfected quarters. The highest cell count was for quarters infected with *S. warneri,* followed by *aureus, agnetis,* and *hyicus.*

The relative distribution of various *Staph.* species and their effect on qSCC in this population of small to midsize organic farms was similar to previous studies describing conventionally-managed dairies. Although the increase in qSCC was modest for most NASM species observed, the widespread nature of these intramammary pathogens can still result in sizeable increases in bulk tank SCC. Future work towards developing more readily available methods of speciation may better inform treatment decisions, allowing producers to treat or cull animals with infections due to more problematic species and withhold treatment for those of less concern.

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Different non-aureus staphylococci and mammaliicocci (NASM) species causing intramammary infections (IMI) in dairy cattle vary widely in both their epidemiology and ecology. As variation in species distribution and diversity is associated with different management practices, disparate selective pressures on organic dairies could potentially result in population differences of these mastitis-causing bacteria. No previous studies have identified which NASM species are most relevant to udder health for a population of certified organic dairies.

The current study presents data from a longitudinal, cross-sectional study of 10 certified organic dairy farms. The objective was to estimate how quarter somatic cell count (qSCC) varied as a result of infection with the most commonly-isolated NASM species, in order to identify which are more relevant to udder health. Aerobic culture of quartermilk samples to identify IMI was conducted in parallel with determination of qSCC. A linear hierarchical repeated measures mixed model was used to compare somatic cell scores associated with quarters identified to have IMI with a given *Staphylococcus* species to culture negative quarters, and included number of days in milk at time of sampling to adjust the estimates of the *Staph.* species and qSCC association.

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Different non-aureus staphylococci and mammaliicocci (NASM) species causing intramammary infections in dairy cattle vary widely in both their epidemiology and ecology. Only a limited number of studies have described the effect of a diverse number of NASM species on quarter-level somatic cell count (SCC) using observations from multiple herds, where isolates were identified using MALDI-TOF or genotypic methods, and accounted for days in milk at time of observation. No previous studies have identified which NASM species are most relevant to udder health for a population of certified organic dairies. As variation in species distribution and diversity is associated with different management practices, disparate selective pressures on organic dairies could potentially result in population differences of these mastitis-causing bacteria.

The current study presents data from a longitudinal, cross-sectional study of 10 certified organic dairy farms. Analyses of quartermilk samples to identify IMI due to NASM were conducted in parallel with determination of quarter-level SCC. The objective was to estimate how quarter SCC varied as a result of infection with the most commonly-isolated NASM species, in order to identify which species were more relevant to udder health. A linear hierarchical repeated measures mixed model was used in order to compare somatic cell scores associated with quarters identified to have intramammary infections with a given *Staphylococcus* species to culture negative quarters, and included number of days in milk at time of sampling to adjust the estimates of the *Staph.* species and quarter SCC association.

The final data set consisted of 648 quarters with an intramammary infection due to 10 different *Staph.* sp., and 1,972 culture negative quarters. *S. chromogenes* was the most commonly-found species, followed by *aureus, haemolyticus,* and *simulans.* A large amount of variability was observed in the somatic cell score for culture negative quarters and those infected with a number of different *Staph.* species, especially *S. chromogenes* and *aureus.* Somatic cell score was significantly higher in quarters infected with *S. agnetis, aureus, chromogenes, devriesei, haemolyticus, hyicus, simulans, warneri, and xylosus* compared to uninfected quarters. The highest cell count was for quarters infected with *S. warneri,* followed by *aureus, agnetis,* and *hyicus.*

The relative distribution of various *Staph.* species and their effect on quarter SCC in this population of small to midsize organic farms was similar to previous studies describing conventionally-managed dairies. Although the increase in quarter SCC was modest for most NASM species observed, the widespread nature of these intramammary pathogens can still result in sizeable increases in the bulk tank SCC. Future work towards developing more readily available methods of speciation may better inform treatment decisions for producers, allowing them to treat or cull animals with infections due to more problematic species and withhold treatment for those of less concern.