

Epidemiology of Coagulase-negative *Staphylococcus* Species in Dairy Heifer Calves and Their Environment.



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INTRODUCTION

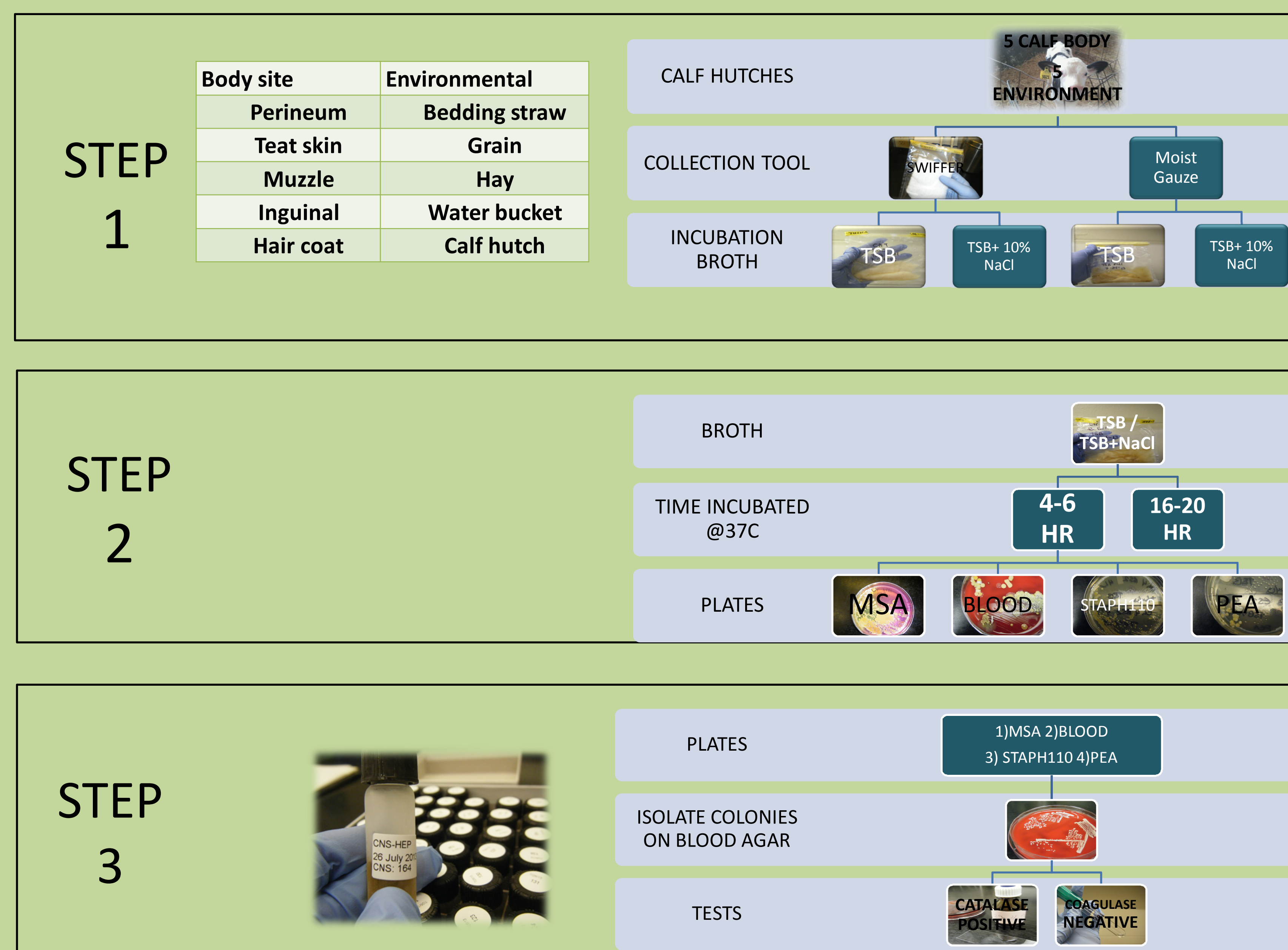
Subclinical mastitis caused by intramammary infection (IMI) with bacteria is a significant problem for the dairy industry because mastitis reduces milk yield and milk quality. Coagulase-negative staphylococcal (CNS) species are the predominant bacteria isolated from heifer mammary glands worldwide. A complete understanding of the ecology and epidemiology of this group of bacteria and an efficient sampling strategy to study these pathogens in dairy heifers and their environment is needed.

PURPOSE

The aims of this study are to 1) develop efficient, sensitive, and specific methods for identification of CNS in dairy heifers and their environment, and 2) use these methods to study the epidemiology of CNS in dairy heifers.

METHODS

Body site and environmental swabbing samples were collected from 4 calves and their environment. Calves were housed in hutches at the University of Missouri, Foremost Dairy and their ages ranged from 1 week to 2 months. Two sampling strategies were applied 1) sterile electrostatic dusters (Swiffer; n = 2 calves and their environment) and 2) sterile saline moistened gauze sponges (n = 2 calves and their environment) to allow comparisons of sampling techniques. Different culture methods were applied to each sample as depicted below.



RESULTS

Forty swabbing samples were collected which yielded 665 isolates across all isolation methods. Data analysis on differences between culture methods is pending. Of these 665 isolates, to date, 25 isolates from 2 calves and their environment have been characterized to the species level (Table 1).

CNS species	Body site			Environment		
	Calf 4	Calf 9	Total	Calf 4	Calf 9	Total
<i>S. chromogenes</i>	0	1	1	0	3	3
<i>S. xylosus</i>	3	2	5	2	0	2
<i>S. haemolyticus</i>	0	5	5	0	3	3

Table 1 – Distribution of characterized isolates by source of isolation and identified staphylococcal species.

The remaining isolates will be characterized over the coming weeks facilitating data analysis comparing efficacy of sample collection techniques, bacterial culture methods, and a preliminary understanding of the epidemiology of CNS colonization in these heifers.

CONCLUSION

The presence of *Staphylococcus chromogenes* and *Staphylococcus xylosus* on the calf and in their environment is an important finding because these species have been associated with IMI in lactating cows, and these bacteria have been associated with increases in mammary quarter milk somatic cell count comparable to that of *Staphylococcus aureus*, a major mastitis pathogen of dairy cattle (De Vliegher S., NMC Regional Meeting Proceedings 2013, p.9-13). From our preliminary data, the finding of these important mastitis pathogens on calves and in the environment illustrates the need to further understand the ecology of CNS species on the dairy farm. At this time, definitive conclusions cannot be drawn until the whole data set has been examined. It is expected that these preliminary data will provide the basis for future studies on the ecology and epidemiology of CNS IMI in dairy heifers.

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