

Table 1: Distribution of *Staphylococcus* species by Farm

Staphylococci	No. of isolates per farm					Total (%)
	A	B	C	D	E	
<i>S. arlettae</i>	-	1	-	-	-	1 (0.1)
<i>S. agnetis</i>	-	-	-	-	3	3 (0.3)
<i>S. aureus</i>	14	10	31	5	8	68 (6.5)
<i>S. auricularis</i>	47	3	30	2	-	82 (7.8)
<i>S. capitis</i>	3	1	3	-	-	7 (0.7)
<i>S. caprae</i>	6	-	-	-	-	6 (0.6)
<i>S. chromogenes</i>	14	36	51	6	34	141 (13.4)
<i>S. cohnii</i>	12	5	-	-	2	19 (1.8)
<i>S. gallinarum</i>	-	2	5	1	-	8 (0.8)
<i>S. epidermidis</i>	9	4	7	2	6	28 (2.7)
<i>S. equorum</i>	14	4	25	9	52	104 (10)
<i>S. fleurettii</i>	-	-	-	-	36	36 (3.4)
<i>S. haemolyticus</i>	19	9	153	71	27	279 (26.5)
<i>S. hominis</i>	3	3	8	-	4	18 (1.7)
<i>S. kloosii</i>	-	-	1	-	-	1 (0.1)
<i>S. lugdensis</i>	-	1	-	-	1	2 (0.2)
<i>S. saprophyticus</i>	1	-	-	1	2	4 (0.4)
<i>S. pasteurii</i>	4	1	1	1	1	8 (0.8)
<i>S. pseudintermedius</i>	-	-	-	-	1	1 (0.1)
<i>S. simulans</i>	21	5	-	-	1	27 (2.6)
<i>S. sciuri</i>	5	-	6	-	-	11 (1)
<i>S. succinus</i>	1	-	-	7	55	63 (6)
<i>S. vitulinus</i>	-	-	-	7	8	15 (1.4)
<i>S. warneri</i>	8	1	2	7	1	19 (1.8)
<i>S. xylosus</i>	2	3	15	43	21	84 (8)
<i>S. sp. C035</i>	1	-	-	-	-	1 (0.1)
<i>S.sp. 020902-022-273</i>	-	1	6	4	5	16 (1.5)
Total	184	90	344	166	268	1052 (100)

(-) = No isolate of that particular species found

Table 2: Distribution of *Staphylococcus* species by source of sample collection

Staphylococci	No. (%) of isolates per niche							Total (%)	
	Quarter Milk ¹	Milking System and Bulk Tank Milk ²		Teat Skin ³	Extra Mammary Cow Skin ⁴	Environment ⁵	Human hand and nose		
		Milk	System and Bulk Tank Milk						
<i>S. arlettae</i>	-	-	1 (100)	-	-	-	-	1 (0.1)	
<i>S. agnetis</i>	2 (66.7)	-	1 (33.3)	-	-	-	-	3 (0.3)	
<i>S. aureus</i>	35 (51.5)	10 (14.7)	12 (17.6)	-	-	10 (14.7)	1	68 (6.5)	
<i>S. auricularis</i>	6 (7.3)	3	44 (53.7)	27 (32.9)	2 (2.4)	-	-	82 (7.8)	
<i>S. capitis</i>	2 (28.6)	-	4 (57.1)	-	1 (14.3)	-	-	7 (0.7)	
<i>S. caprae</i>	1 (16.7)	-	1 (16.7)	4 (66.7)	-	-	-	6 (0.6)	
<i>S. chromogenes</i>	82 (58.2)	22 (15.6)	18 (12.8)	15 (10.6)	2 (1.4)	-	2 (1.4)	141 (13.4)	
<i>S. cohnii</i>	-	3 (15.8)	10 (52.6)	2 (10.5)	4 (21.1)	-	-	19 (1.8)	
<i>S. gallinarum</i>	4 (50)	3 (37.5)	-	1 (12.5)	-	-	-	8 (0.8)	
<i>S. epidermidis</i>	7 (25)	-	4 (14.3)	1 (3.8)	-	16 (57.1)	-	28 (2.7)	
<i>S. equorum</i>	11 (10.6)	5 (4.8)	21 (20.2)	28 (26.9)	29 (27.9)	7 (6.7)	3 (2.9)	104 (10)	
<i>S. fleurettii</i>	9 (25)	6 (16.7)	12 (33.3)	6 (16.7)	1 (2.8)	2	-	36 (3.4)	
<i>S. haemolyticus</i>	37 (13.26)	10 (3.6)	110 (39.4)	109	7 (2.5)	5 (1.8)	1 (0.4)	279 (26.5)	
<i>S. hominis</i>	5 (27.8)	3 (16.7)	4 (22.2)	2 (11.1)	-	4 (22.2)	-	18 (1.7)	
<i>S. kloosi</i>	-	-	1 (100)	-	-	-	-	1 (0.1)	
<i>S. lugdensis</i>	-	-	-	-	-	2 (100)	-	2 (0.2)	
<i>S. saprophyticus</i>	1 (25)	-	-	1 (25)	-	2 (50)	-	4 (0.4)	
<i>S. pasteurii</i>	1 (12.5)	1 (12.5)	-	1 (12.5)	-	5 (62.5)	-	8 (0.8)	
<i>S. pseudintermedius</i>	-	-	-	-	-	-	1 (100)	1 (0.1)	
<i>S. simulans</i>	13 (48)	2 (7.4)	9 (33.3)	3	-	-	-	27 (2.6)	
<i>S. sciuri</i>	-	-	-	1 (9.1)	7 (63.6)	-	3 (27.3)	11 (1)	
<i>S. succinus</i>	3 (4.8)	7 (11.1)	27 (42.9)	15 (23.8)	6 (9.5)	4 (6.3)	1 (1.6)	63 (6)	
<i>S. vitulinus</i>	2 (13.3)	1 (6.7)	3 (20)	6 (40)	2 (13.3)	1 (6.7)	-	15 (1.4)	
<i>S. warneri</i>	4 (21.1)	4 (21.1)	1 (5.3)	2 (10.5)	-	7 (36.8)	1 (5.3)	19 (1.8)	
<i>S. xylosus</i>	9 (10.7)	4 (4.8)	21 (25)	21 (25)	25 (29.8)	2 (2.4)	2 (2.4)	84 (8)	
<i>S. sp. C035</i>	-	-	-	-	-	-	1 (100)	1 (0.1)	
<i>S.sp. 020902-022-273</i>	5 (31.3)	1 (6.3))	5 (31.3)	5 (31.3)	-	-	-	16 (1.5)	
Total	239 (22.7)	85 (8.1)	309 (29.4)	250 (23.8)	86 (8.2)	67 (6.4)	16 (1.5)	1052 (100)	

1: Includes quarter and cannulated milk samples 2: Includes bulk tank milk, milk filter, inflation pre-milking, teat cup post-milking samples. 3:Includes streak canal, teat end, teat barrel, and teat laceration samples. 4: Includes perineum, hock, vagina, cow nose, udder cleft samples. 5: Includes stall partition rail, grain, water bowl rim, used sawdust bedding, feed trough and water trough samples.

Table 3: Prevalence of beta lactam and methicillin genetic markers among *Staphylococcus* species isolated from different sources on five dairy farms

Staphylococci	No. (%) of isolates positive for blaz/mecA genes or both			Total
	blaz	mecA	blaz +mecA	
<i>S. arlettae</i>	-	-	-	1
<i>S. agnetis</i>	-	-	-	3
<i>S. aureus</i>	9 (13.2)	-	-	68
<i>S. auricularis</i>	36 (43.9)	-	-	82
<i>S. capitis</i>	-	-	-	7
<i>S. caprae</i>	-	-	-	6
<i>S. chromogenes</i>	35 (24.8)	-	-	141
<i>S. cohnii</i>	-	-	-	19
<i>S. gallinarum</i>	-	-	-	8
<i>S. epidermidis</i>	18 (64.3)	2 (7.1)	2 (7.1)	28
<i>S. equorum</i>	-	-	-	104
<i>S. fleurettii</i>	-	36 (100)	-	36
<i>S. haemolyticus</i>	31 (11.1)	-	-	279
<i>S. hominis</i>	7 (38.9)	2 (11.1)	2 (11.1)	18
<i>S. kloosii</i>	-	-	-	1
<i>S. lugdensis</i>	1 (50)	-	-	2
<i>S. saprophyticus</i>	-	-	-	4
<i>S. pasteurii</i>	4 (50)	-	-	8
<i>S. pseudintermedius</i>	1 (100)	-	-	1
<i>S. simulans</i>	8 (29.6)	-	-	27
<i>S. sciuri</i>	2 (18.2)	10 (90.1)	2 (18.1)	11
<i>S. succinus</i>	-	-	-	63
<i>S. vitulinus</i>	-	4 (26.7)	-	15
<i>S. warneri</i>	11 (57.9)	-	-	19
<i>S. xylosus</i>	-	-	-	84
<i>S. sp. C035</i>	-	-	-	1
<i>S. sp. 020902-022-273</i>	6 (37.5)	-	-	16
Total	169 (16.1)	54 (5.1)	6 (0.6)	1052

Table 4: Distribution of MIC for selected coagulase negative staphylococci (n=562) isolated from various niches on dairy farms

Antibiotic	Resistant ¹	BP ² (ug/ml)	Percentage of isolates inhibited at each concentration (ug/ml)													NI
			≤0.12	≤1/2	2/4	0.25	0.5	1	2	4	8	16	32	64	128	256
Ampicillin	3	≤0.25	91.5	-	-	5.5	2	0.7	0.4	-	-	-	-	-	-	-
Penicillin	3.8	≤0.12	92.5	-	-	3.7	1.6	0.9	0.4	0.2	0.5	-	-	-	-	-
Cephalothin	0	≤8	-	-	-	-	-	-	99.3	0.5	0.2	-	-	-	-	-
Cefotiofur	0	≤2	-	-	-	-	81.3	15.5	3.2	-	-	-	-	-	-	-
Oxacillin	0.5	≤2	-	-	-	-	-	99.5	0.2	-	-	-	-	-	-	0.3
Erythromycin	11.5	≤0.5	-	-	-	73.7	14.8	1.6	1.6	2.1	-	-	-	-	-	6.2
Pirlimycin	8.3	≤2	-	-	-	-	72.2	9.6	10	4.4	-	-	-	-	-	3.9
Tetracycline	8.9	≤4	-	-	-	-	-	87.4	3.4	0.5	0.5	-	-	-	-	8.4
Penicillin/Novobiocin	0	≤1/2	-	99.3	0.7	-	-	-	-	-	-	-	-	-	-	-
Sulfadimethoxine	NA	NA	-	-	-	-	-	-	-	-	-	59.3	3.9	6	2.5	27.9

1. Proportion classified as resistant based on CLSI breakpoints

2. Break point, MIC at which an isolate is considered susceptible according CLSI (2013) guideline

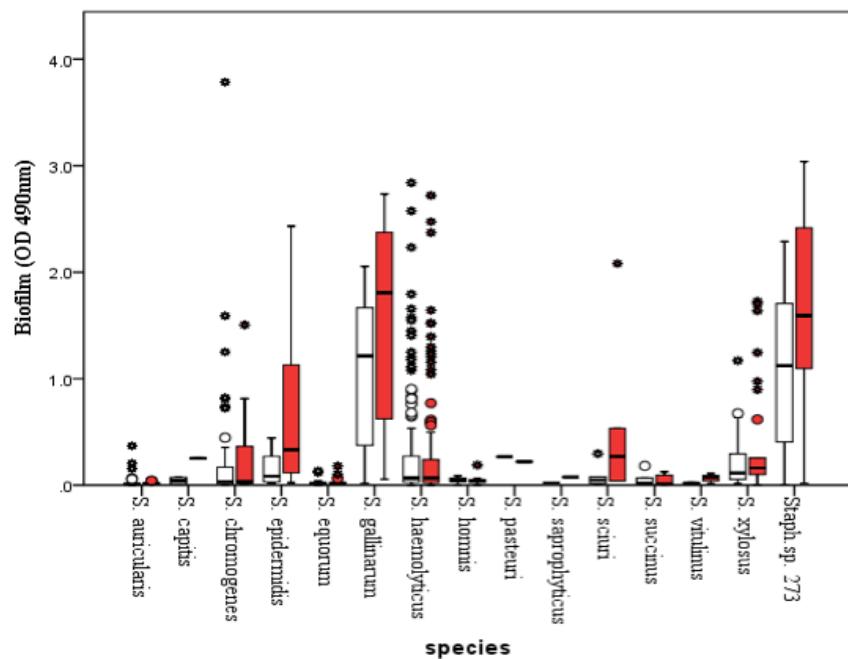


Figure 1: Biofilm formation among coagulase negative staphylococci on hydrophobic and hydrophilic surface types (n=365). Hydrophobic= Red box plots, hydrophilic = Red box plots. Overall biofilm biomass was higher on hydrophilic surfaces though not statistically significant.