B-strep risikofaktorer, diagnostik og sanering?

Yverkursus, Agerskov Kro

5. marts 2024

12 kursister (dyrlæger på efterudd.)

Line Svennesen
Adjunkt, Københavns Universitet

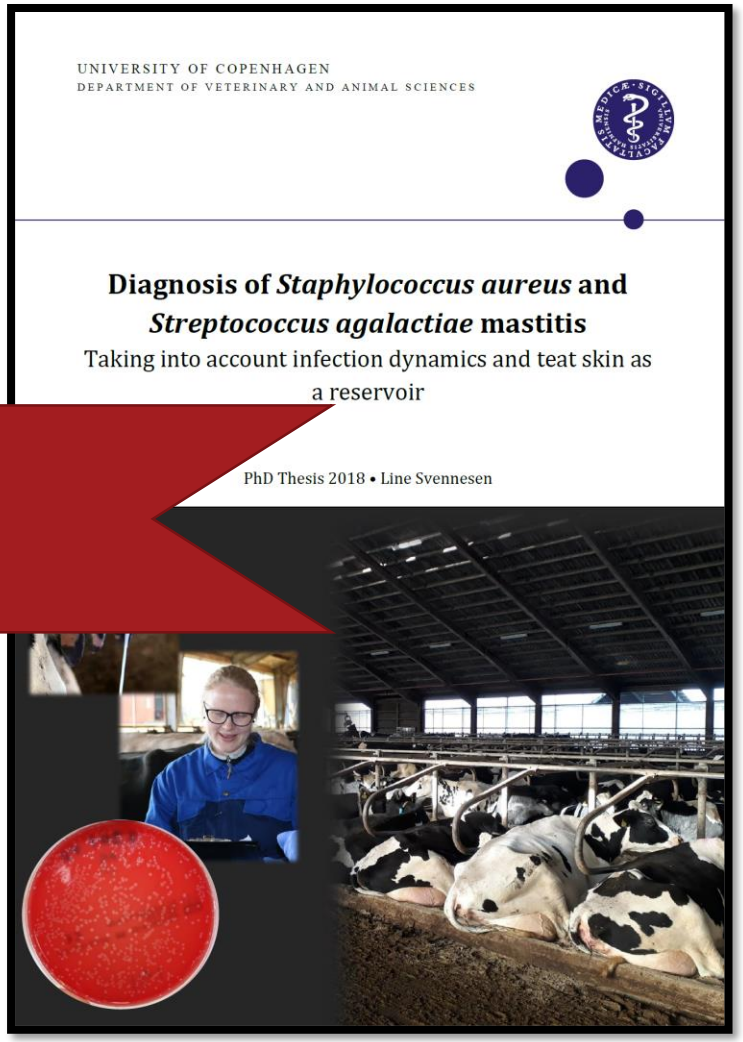
KØBENHAVNS UNIVERSITET

STØTTET AF
Mælkeafgiftsfonden

Line

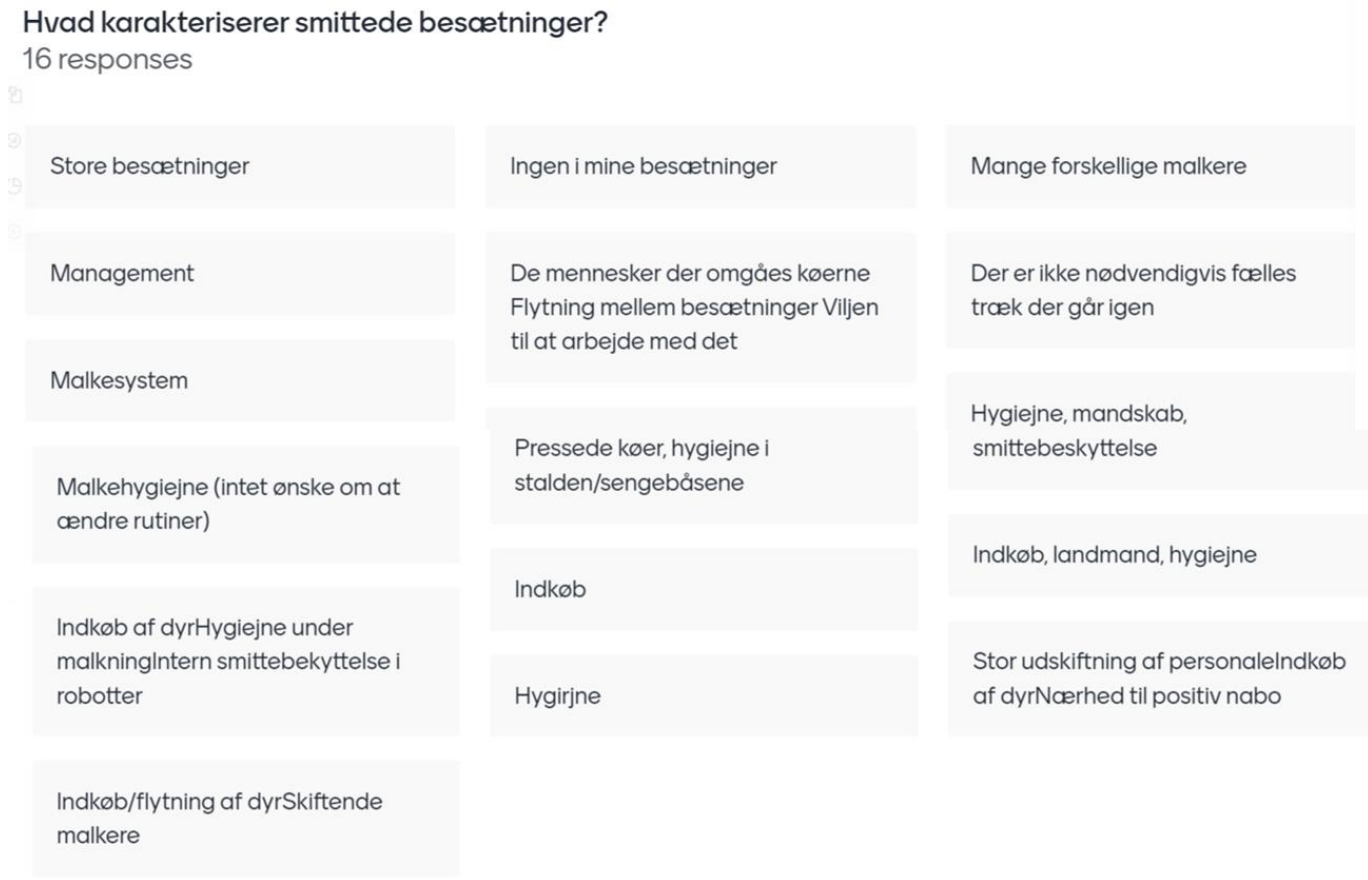
- DVM, PhD, Adjunkt
- Ansat ved KU i snart 10 år
- Phd om diagnostik af aureus og B-strep
- Projekt om behandling af mastitis, B-strep og smittebeskyttelse
- Underviser dyrlægestuderende

Praksisnær forskning?!



Risikofaktorer for smitte

- Hvilke besætninger er / bliver smittede ?
- Del jeres erfaringer på mentimeter.com:



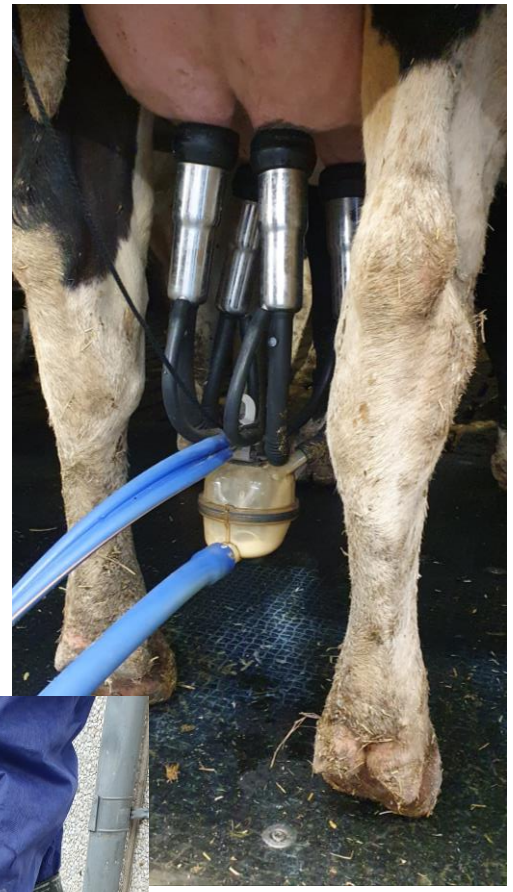
Hvad er årsagen til at en besætning er B-strep positiv?

- Reel smitte?
- Smitte på papiret, fx sammenlægning af ejendomme?
- Falsk positive test?
- Svært at blive fri?

Hvordan kan man blive smittet?

- Reservoir i mælk
- Reservoir på pattehud
- Reservoir på slimhinder
- Reservoir i gødning

Internt mellem køer kan det overføres mange steder i stalden (malkning, senge, gødning)

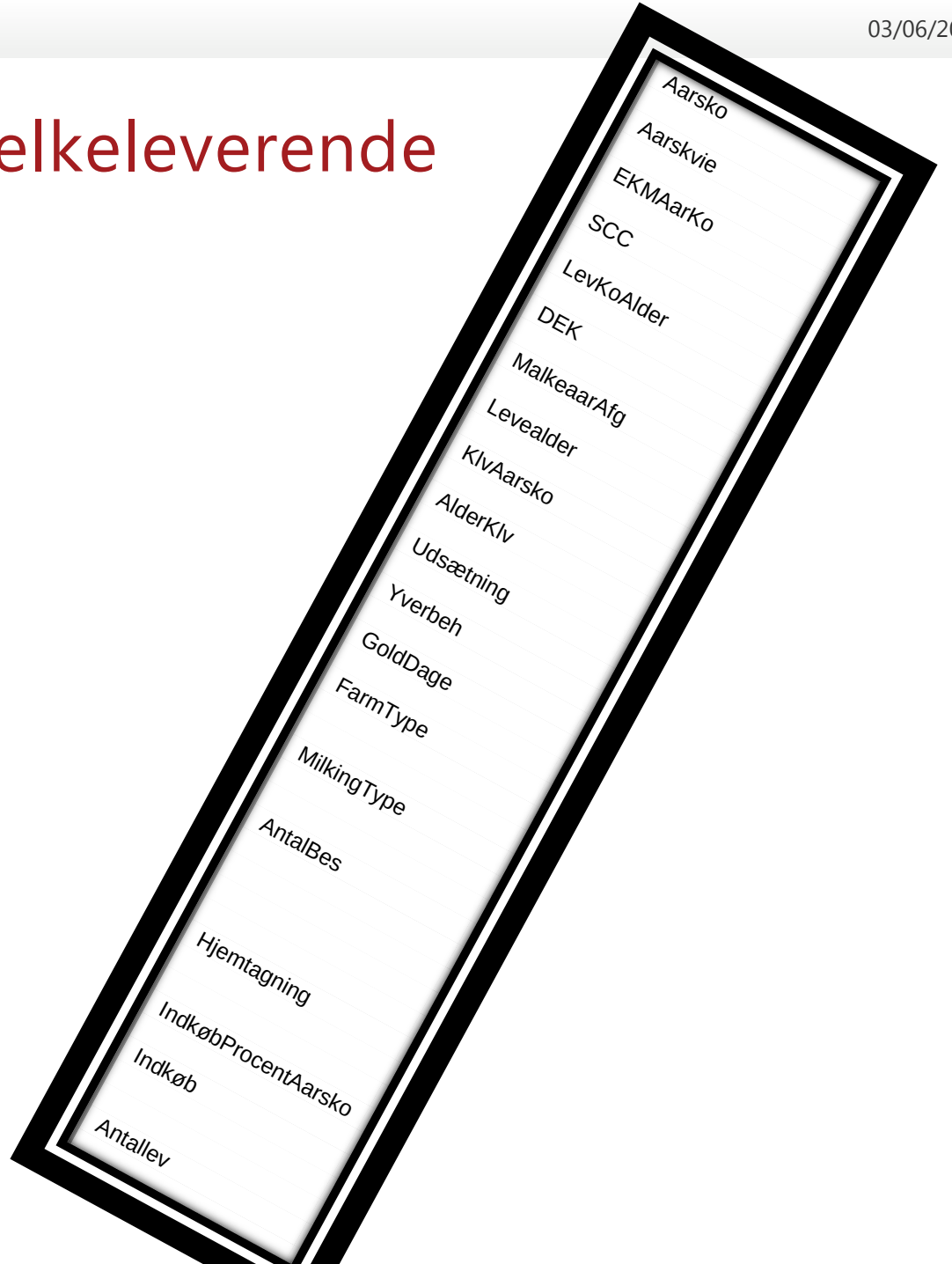


- Indførsel af dyr
- Medarbejdere?
- Gødning og mælk via gæster?
- Kæledyr, vilde dyr, skadedyr?

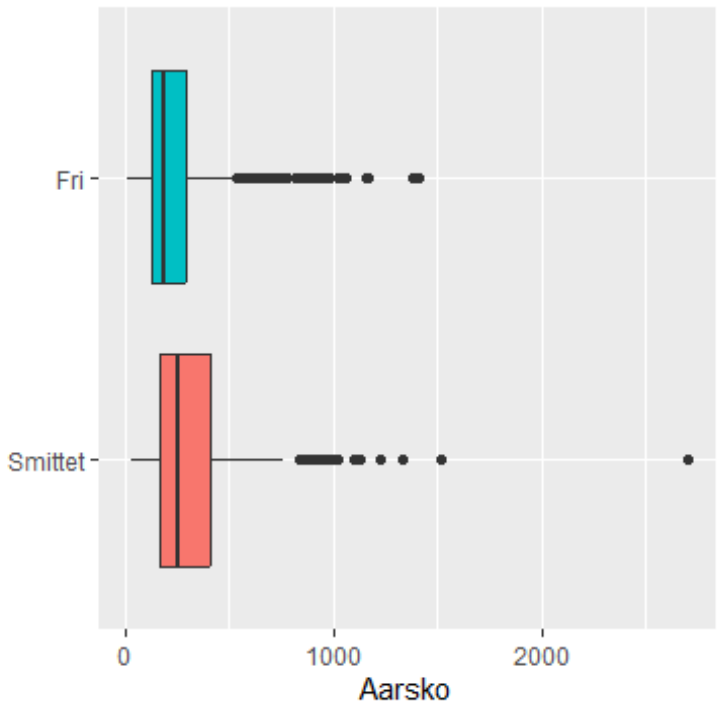
Ekstern smitte

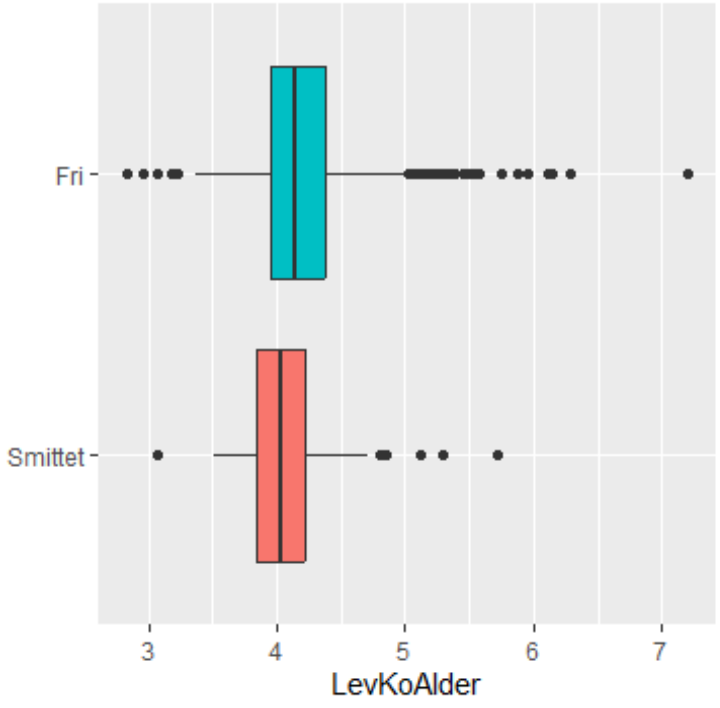
Karakteristika for smittede mælkeleverende driftsenheder?

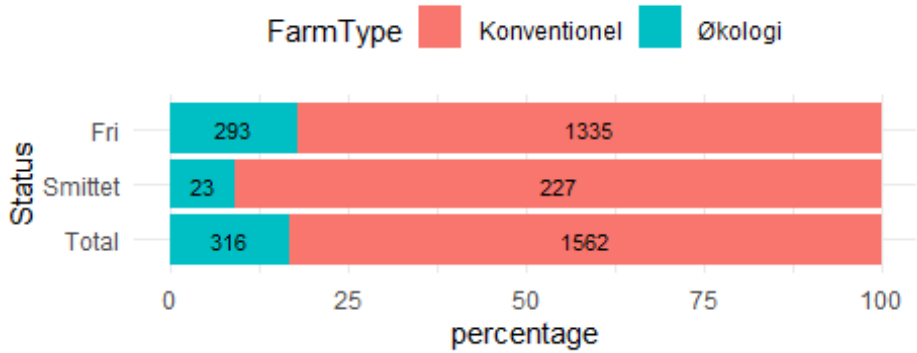
- Ud fra status data hen over 1 år
- KPI'er fra DMS
- Ingen kausalitet!
- <u>Foreløbige resultater</u>

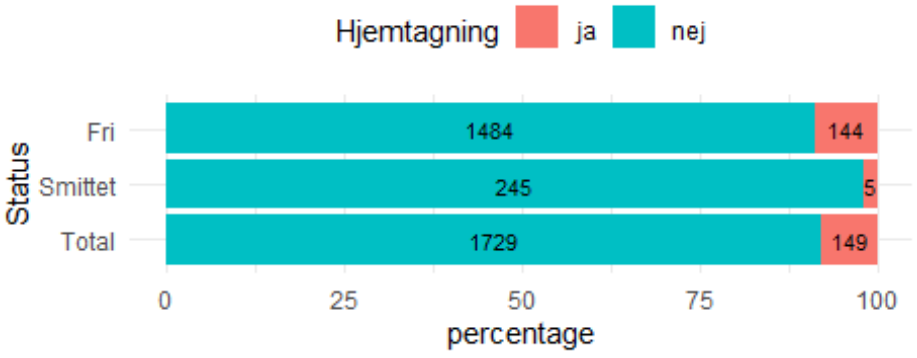


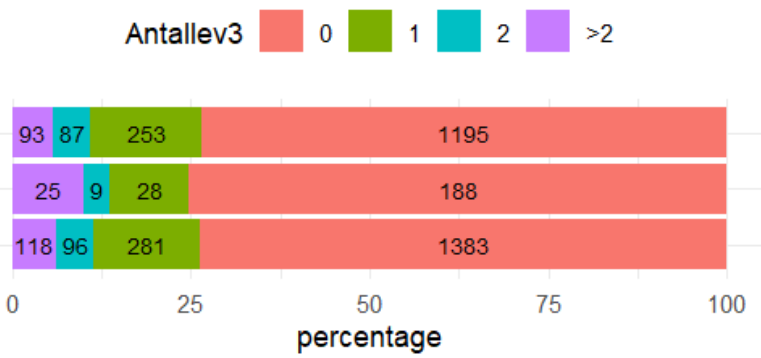
Karakteristika smittede mælkeleverende driftsenheder?











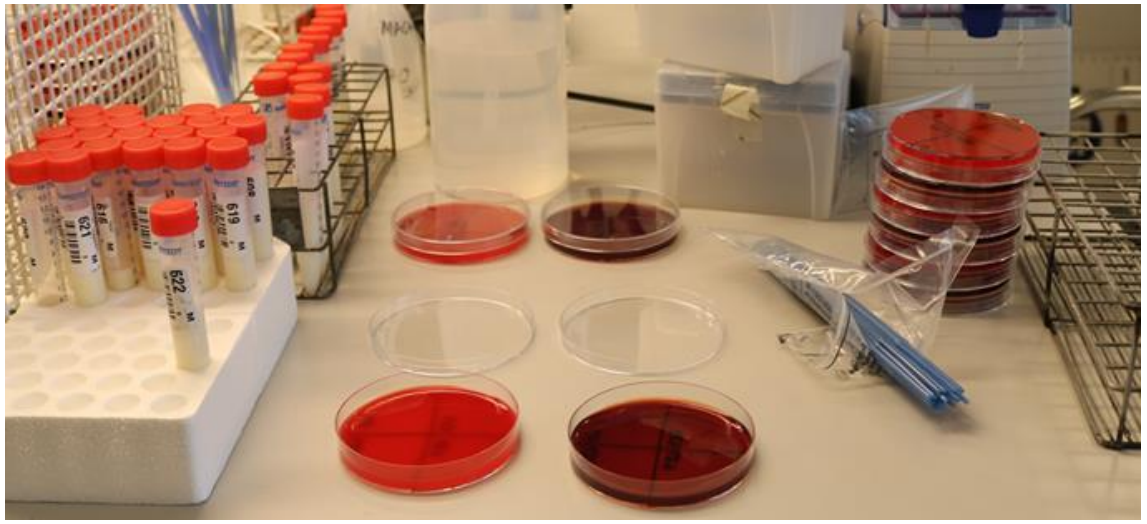
Multivariable

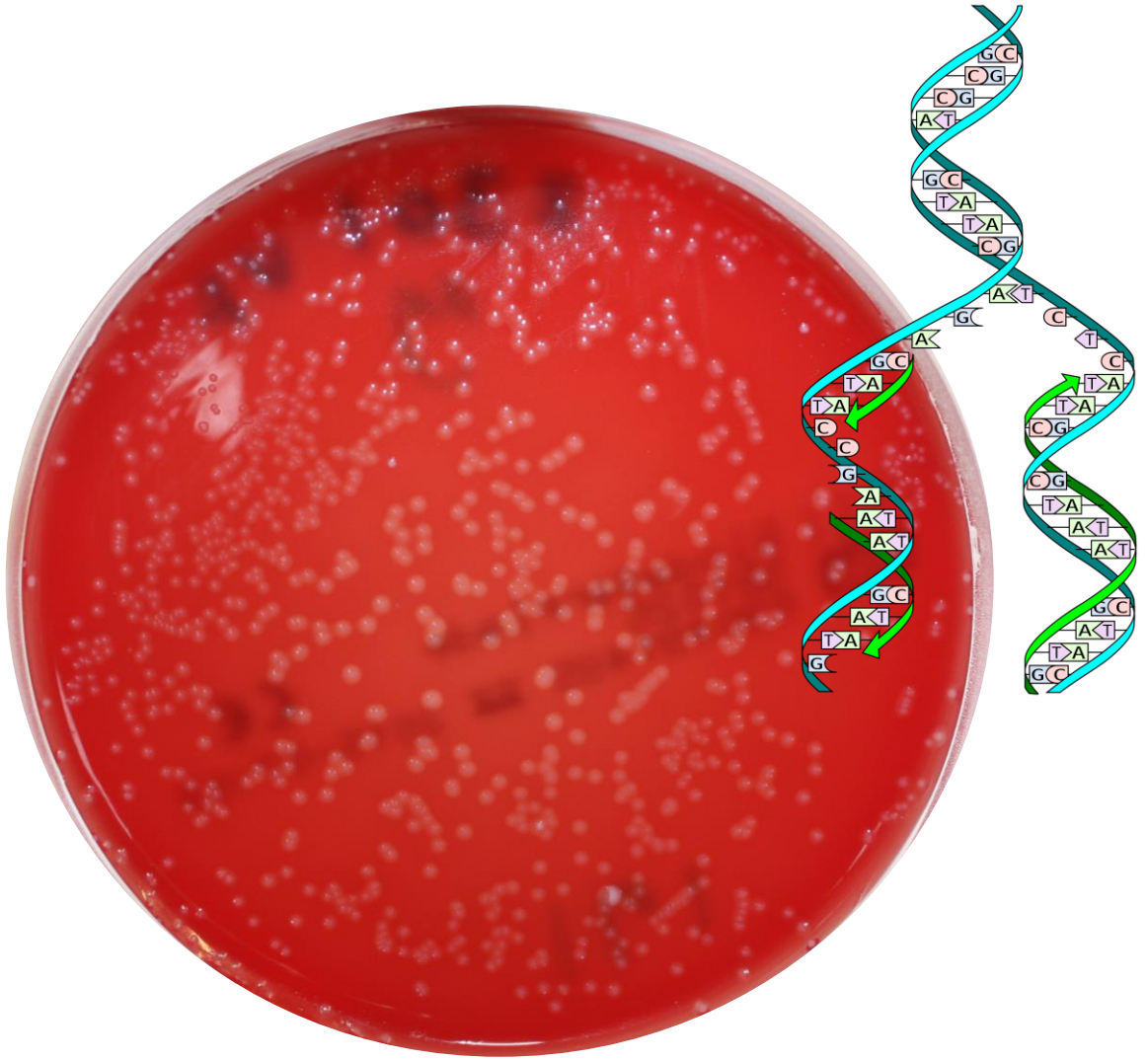
OR Årsko = 1,01
OR >2 Leverandører = 1,75
OR Ko alder = 0,45
OR Økologi = 0,59
OR Ingen hjemtagning = 4,95 ?

Univariable

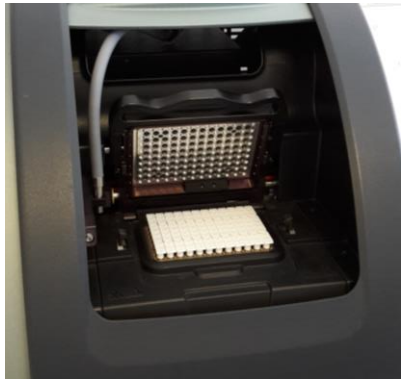
x_var	levels	Total	Status		p.value
			Smittet	Fri	
Aarsko					
	Aarsko	247.85 (4.51)	344.34 (18.21)	233.03 (4.28)	**0.0000**
Aarskvie					
	Aarskvie	219.18 (4.08)	299.01 (16.45)	206.97 (3.89)	**0.0000**
EKMAarKo					
	EKMAarKo	10964.03 (34.21)	11143.92 (79.58)	10936.33 (37.49)	**0.0398**
SCC					
	SCC	222.16 (1.62)	219.1 (4.26)	222.63 (1.76)	0.1168
LevKoAlder					
	LevKoAlder	4.17 (0.01)	4.06 (0.02)	4.19 (0.01)	**0.0001**
DEK					
	DEK	202.91 (0.58)	197.39 (0.95)	203.76 (0.66)	**0.0001**
MalkeaarAfg					
	MalkeaarAfg	3.07 (0.01)	2.97 (0.03)	3.09 (0.01)	**0.0040**
Levealder					
	Levealder	5.18 (0.01)	5.06 (0.03)	5.2 (0.02)	**0.0012**
KlvAarsko					
	KlvAarsko	1.04 (0)	1.07 (0.01)	1.04 (0)	**0.0001**
AlderKlv					
	AlderKlv	25.05 (0.05)	24.85 (0.12)	25.08 (0.05)	0.1148
Udsætning					
	Udsætning	0.36 (0)	0.37 (0.01)	0.36 (0)	**0.0131**
Yverbeh					
	Yverbeh	0.18 (0)	0.21 (0.01)	0.18 (0)	0.6090
GoldDage					
	GoldDage	50.44 (0.16)	50.73 (0.42)	50.4 (0.18)	0.6090
FarmType					
	Konventionel	1562 (83.2%)	227 (14.5%)	1335 (85.5%)	**0.0002**
	Økologi	316 (16.8%)	23 (7.3%)	293 (92.7%)	
MilkingType					
	AMS	602 (32.1%)	87 (14.5%)	515 (85.5%)	0.3208
	Konventionel	1276 (67.9%)	163 (12.8%)	1113 (87.2%)	
AntalBes					
	1	1465 (78%)	174 (11.9%)	1291 (88.1%)	**0.0106**
	2	323 (17.2%)	60 (18.6%)	263 (81.4%)	
	3	75 (4%)	13 (17.3%)	62 (82.7%)	
	4	15 (0.8%)	3 (20%)	12 (80%)	
Hjemtagning					
	ja	149 (7.9%)	5 (3.4%)	144 (96.6%)	**0.0000**
	nej	1729 (92.1%)	245 (14.2%)	1484 (85.8%)	
IndkøbProcentAarsko					
	IndkøbProcentAarsko	14.84 (1.37)	18.52 (4.18)	14.32 (1.45)	0.5785
Indkøb					
	ja	495 (26.4%)	62 (12.5%)	433 (87.5%)	0.5460
	nej	1383 (73.6%)	188 (13.6%)	1195 (86.4%)	
Antallev					
	0	1383 (73.6%)	188 (13.6%)	1195 (86.4%)	**0.0084**
	1	281 (15%)	28 (10%)	253 (90%)	
	2	96 (5.1%)	9 (9.4%)	87 (90.6%)	
	3	50 (2.7%)	9 (18%)	41 (82%)	
	4	20 (1.1%)	3 (15%)	17 (85%)	
	5	20 (1.1%)	2 (10%)	18 (90%)	
	6	6 (0.3%)	1 (16.7%)	5 (83.3%)	
	7	6 (0.3%)	1 (16.7%)	5 (83.3%)	
	8	4 (0.2%)	2 (50%)	2 (50%)	
	>8	12 (0.6%)	7 (58.3%)	5 (41.7%)	

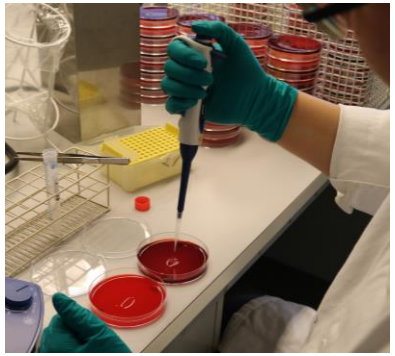
Diagnostik





Diagnostik





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Accuracy of qPCR and bacterial culture for the diagnosis of bovine intramammary infections and teat skin colonisation with *Streptococcus agalactiae* and *Staphylococcus aureus* using Bayesian analysis

Line Svennesen[a,*], Yasser S. Mahmmod[a,b,1], Nanna K. Skjølstrup[a], Louise R. Mathiasen[a], Jørgen Katholm[c], Karl Pedersen[d], Ilka C. Klaas[a,2], Søren S. Nielsen[a]

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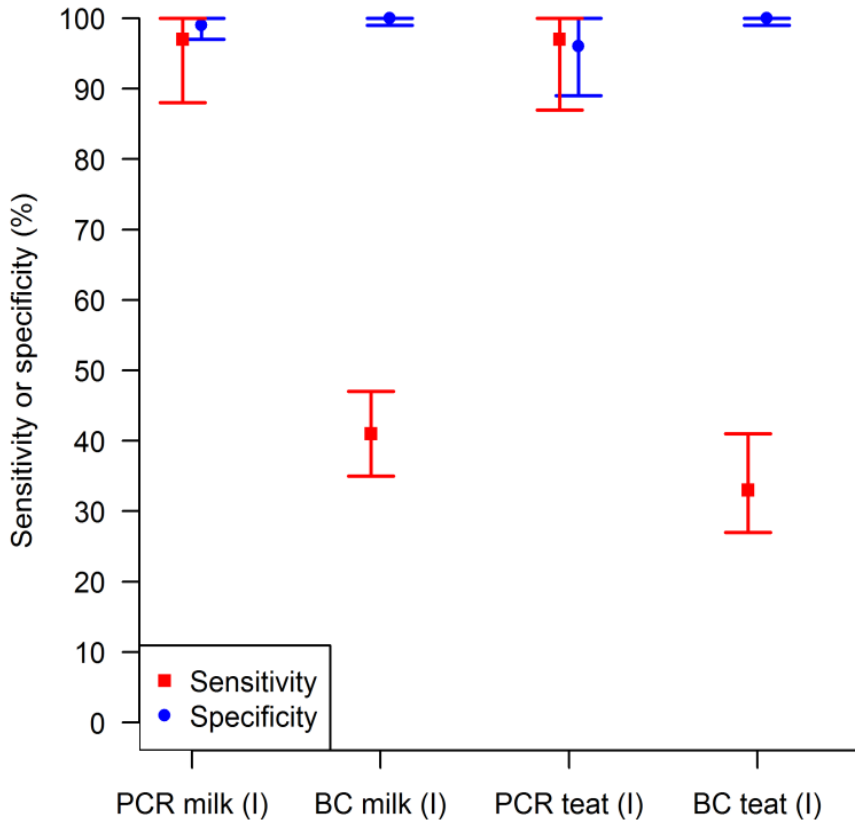

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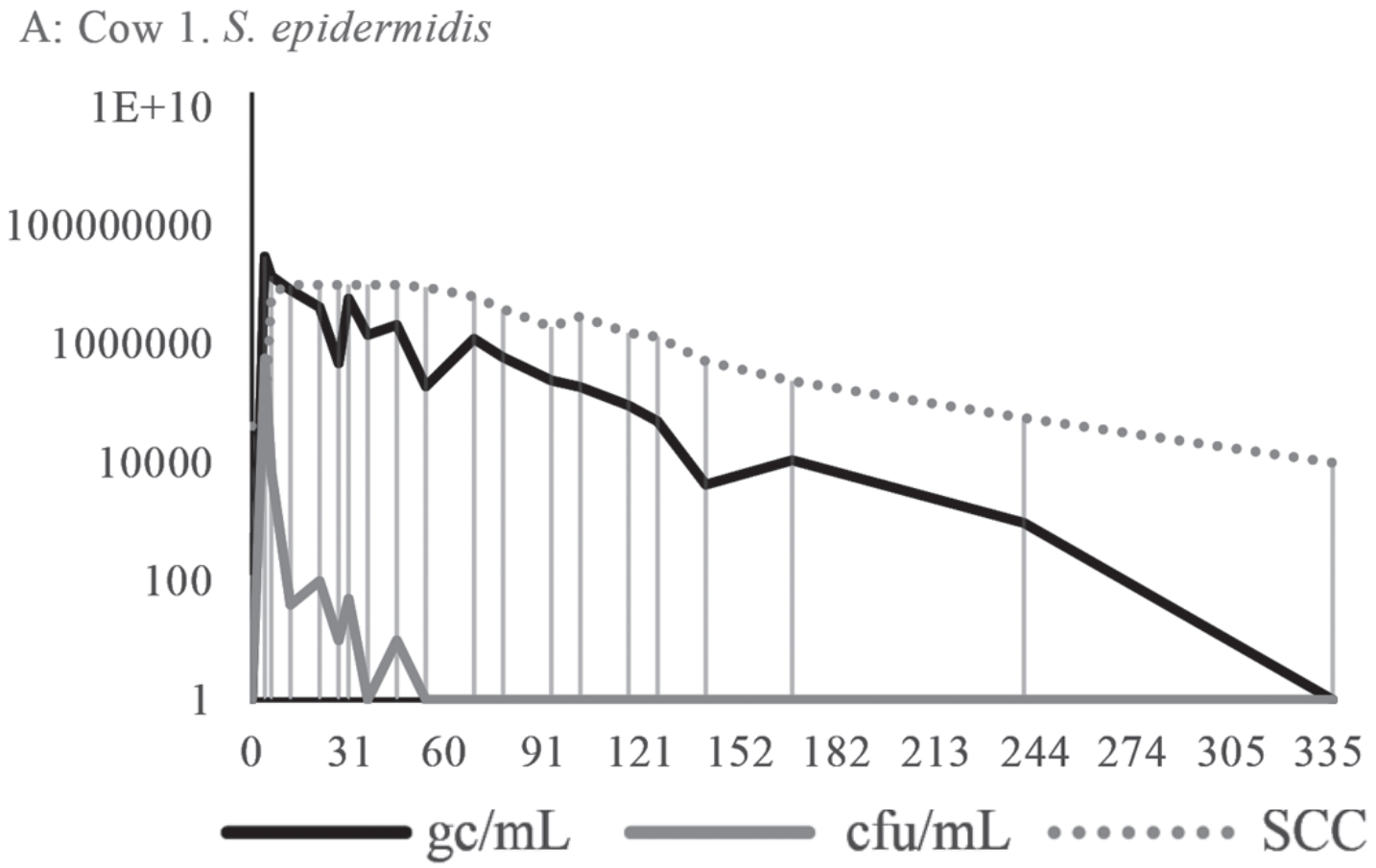
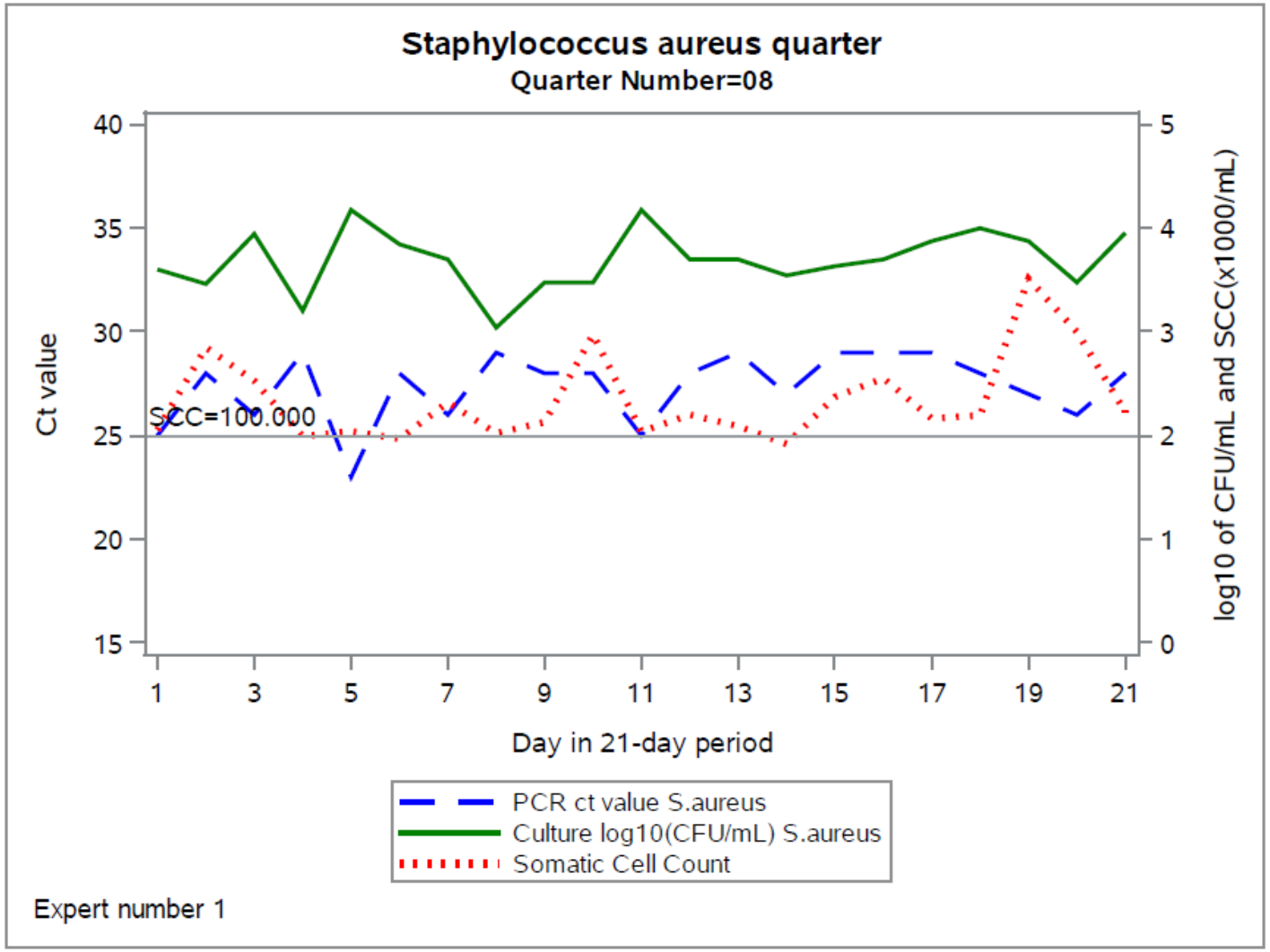
Elimination of experimentally induced bovine intramammary infection assessed by multiplex real-time PCR and bacterial culture

Heidi Hiitiö,[1] Satu Pyörälä, Suvi Taponen, Päivi Rajala-Schultz, and Heli Simojoki
Department of Production Animal Medicine, University of Helsinki, Paroninkuja 20, 04920 Saarentaus, Mäntsälä, Finland



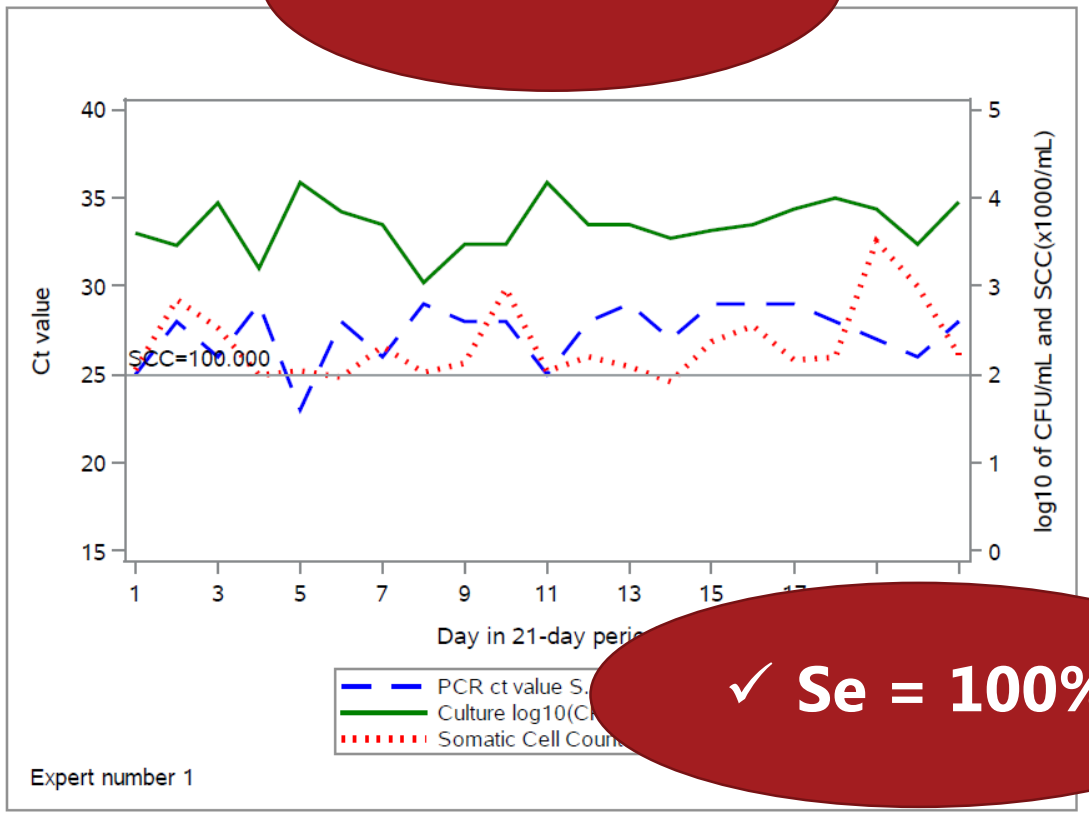
Kig på kort

- Beslut om kirtlen er inficeret eller ej



Hvad er værdien af 1 test resultat?

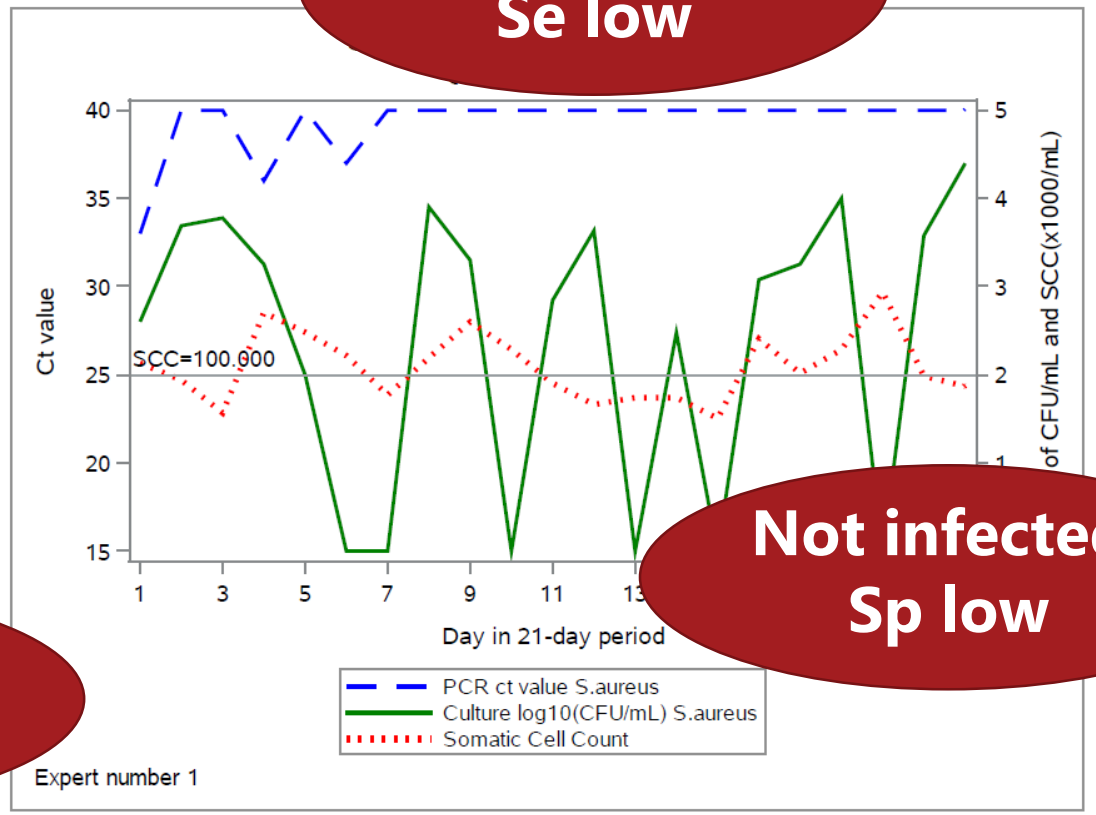
✓ Infected



✓ Se = 100%

Always concluded "Infected"

Infected: Se low



Not infected: Sp low

Mainly coded "**Dynamic infected**", but also "Healthy", "Healthy w. false positives", "Transient" and "Persistent with false negatives"

Fortolkning af test-svar

- Line Svennesen, phd, 2019

Table 5.2: Suggested interpretations of diagnostic test results for *Streptococcus agalactiae* using different tests and samples. The recommendations are based on results from this thesis and published literature

Sample	Test	Result	Interpretation
Aseptically collected quarter milk sample	BC	Positive[1]	IMI is present, the risk of a false-positive sample is 1%[a]
		Negative[2]	IMI could be present with 60%[b] risk of a false-negative; test with PCR and/or test a new sample 3 days later and combine information with results from SCC if available
	PCR	Positive[3]	IMI is present, the risk of a false-positive sample is < 3%[a]
		Negative[4]	IMI could still be present, the sample could be negative due to variation in shedding, but the risk is low (< 12%[b]); combine information with results from SCC if available
Non-aseptically collected composite or quarter milk sample	BC	Positive[1]	IMI is present, the risk of a false-positive sample is as likely as for aseptically collected samples (1%), as teat skin colonisation is unlikely detected by BC in non-IMI quarters
		Negative[2]	IMI could be present with the same or higher risk of false-negative as for an aseptically collected sample; repeat testing with PCR on aseptically collected sample and combine information with results from SCC if available
	PCR	Positive[3]	IMI most likely present, but this could also be bacteria from teat skin or environment and the risk of a false-positive sample will be higher than 3% due to the non-aseptically collection
		Negative[4]	IMI could still be present, the sample could be negative due to variation in shedding, but the risk is as low as for an aseptically collected sample (< 12%); combine information with results from SCC if available

[1] Bacterial culture (BC) is considered positive at ≥ 100 cfu/mL; [2] BC is considered negative if no growth is assessed using at least 0.01 mL of milk for plating; [3] PCR is considered positive at Ct ≤ 37; [4] PCR is considered negative at Ct > 37; [a] The risk of false-positives is based on estimates from Manuscript II and calculated as 100% – Specificity from informative estimates; [b] The risk of false negatives is based on estimates from Manuscript II and calculated as 100% – Sensitivity from informative estimates

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Retrospective cohort study of management procedures associated with dairy herd-level eradication of *Streptococcus agalactiae* in the Danish surveillance program

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Department of Animal Science, Aarhus University, Blichers Allé 20, DK-8830 Tjele, Denmark

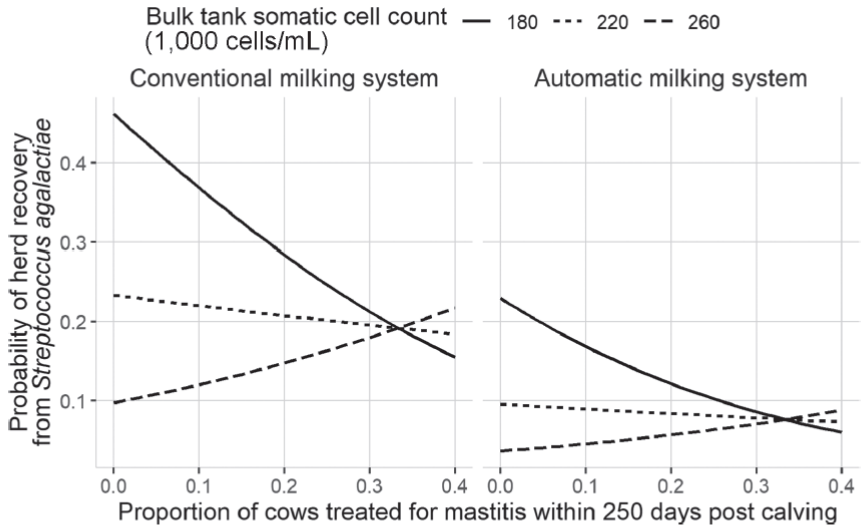

Figure 1. Predictions from multivariable logistic regression. Predicted probability of herd-level recovery from *Streptococcus agalactiae* plotted against the proportion of cows treated for mastitis within 250 d postcalving for different bulk milk SCC levels. The predictions are divided into herds with conventional and automatic milking system. The upper range for the predictions is 40% of cows treated for mastitis because few of the study herds exceeded this percentage. The proportion of cows culled due to mastitis within 100 d after calving was fixed at the median 0.20 for the predictions.

CONCLUSIONS

A higher proportion of culling due to mastitis within 100 d from calving was associated with a higher probability of herd-level recovery from *Strep. agalactiae* in herds with conventional milking systems. Additionally, a higher proportion of mastitis treatments within 250 d postcalving was associated with a higher probability of herd-level recovery from *Strep. agalactiae* in herds with a high bulk milk SCC. The extent of diagnoses relative to the extent of mastitis treatments, the proportion of cows treated for mastitis early in lactation, the proportion of cows treated at dry-off, and the median length of the dry period for cows receiving dry cow treatment was not associated with herd-level recovery from *Strep. agalactiae*. The results suggest that early culling or lactational treatment of infectious cows may facilitate herd-level eradication of *Strep. agalactiae* in herds with conventional milking systems and a relatively high infection level.

Sanering – bud på løsninger

- Kontrolprogram og restriktioner som incitement
- Hygiejne/smittebeskyttelse
- Behandling og udsætning
- Goldbehandling
- …