

Real time PCR values for mastitis pathogens – relations to milk quality and herd characteristics in Danish dairy herds

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KNOWLEDGE CENTRE FOR AGRICULTURE

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SAMPLES

- Bulk tank samples collected October 2009-January 2010
- 4258 herds (all Danish dairy herds)
- Data on Somatic cell count available from all deliveries in 90% of herds. The rest once per week.
- Total Bacteria Count measured every two weeks.

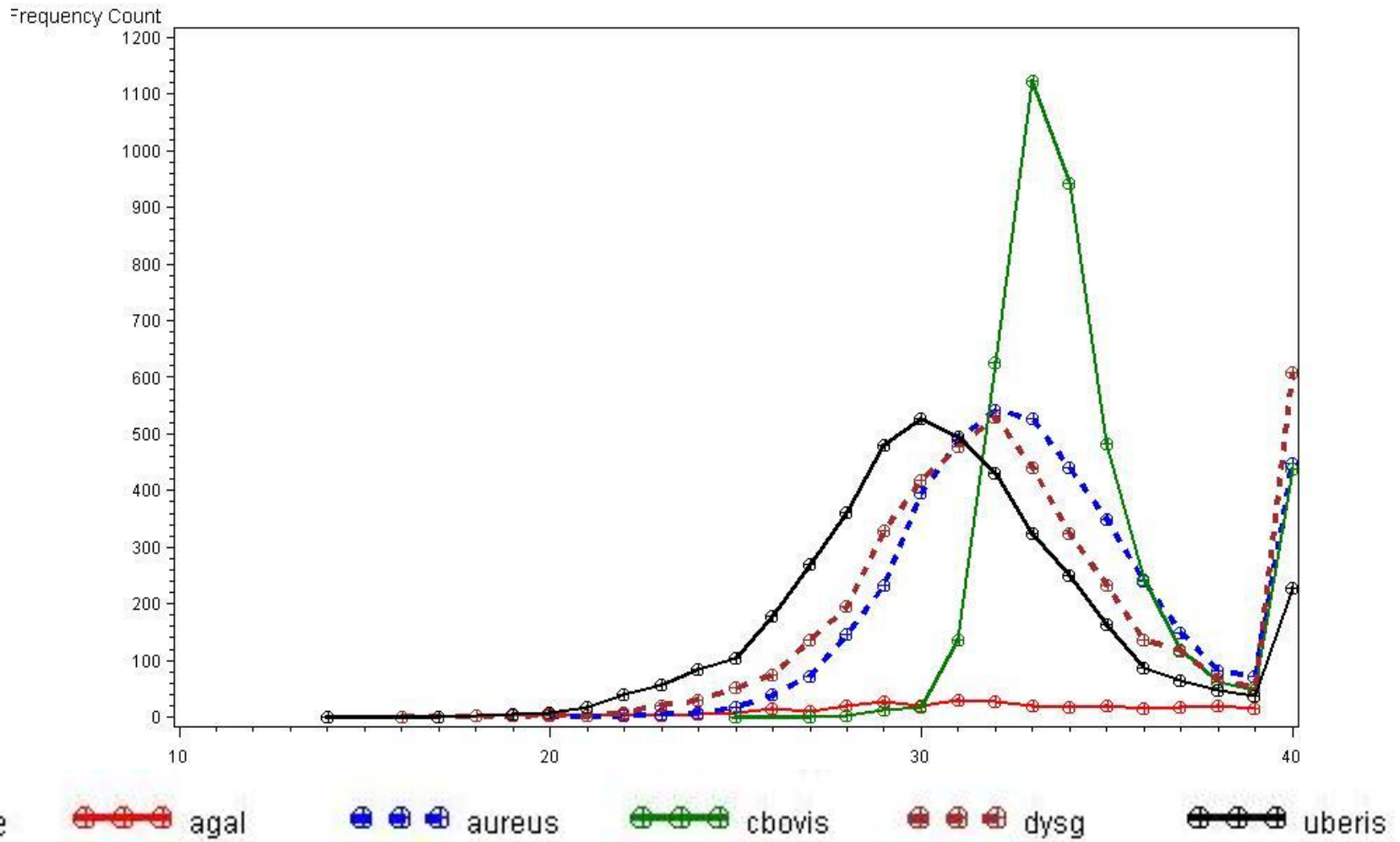
PCR-analysis

- PathoProof® by Thermo Fisher Scientific
- 11 bacteria plus beta-laktamase
- Measured as Ct value. Low value = high concentration of bacteria.
- Ct=40 as cut-off = no infection.

Herds with NoCt and median of herds with Ct<40

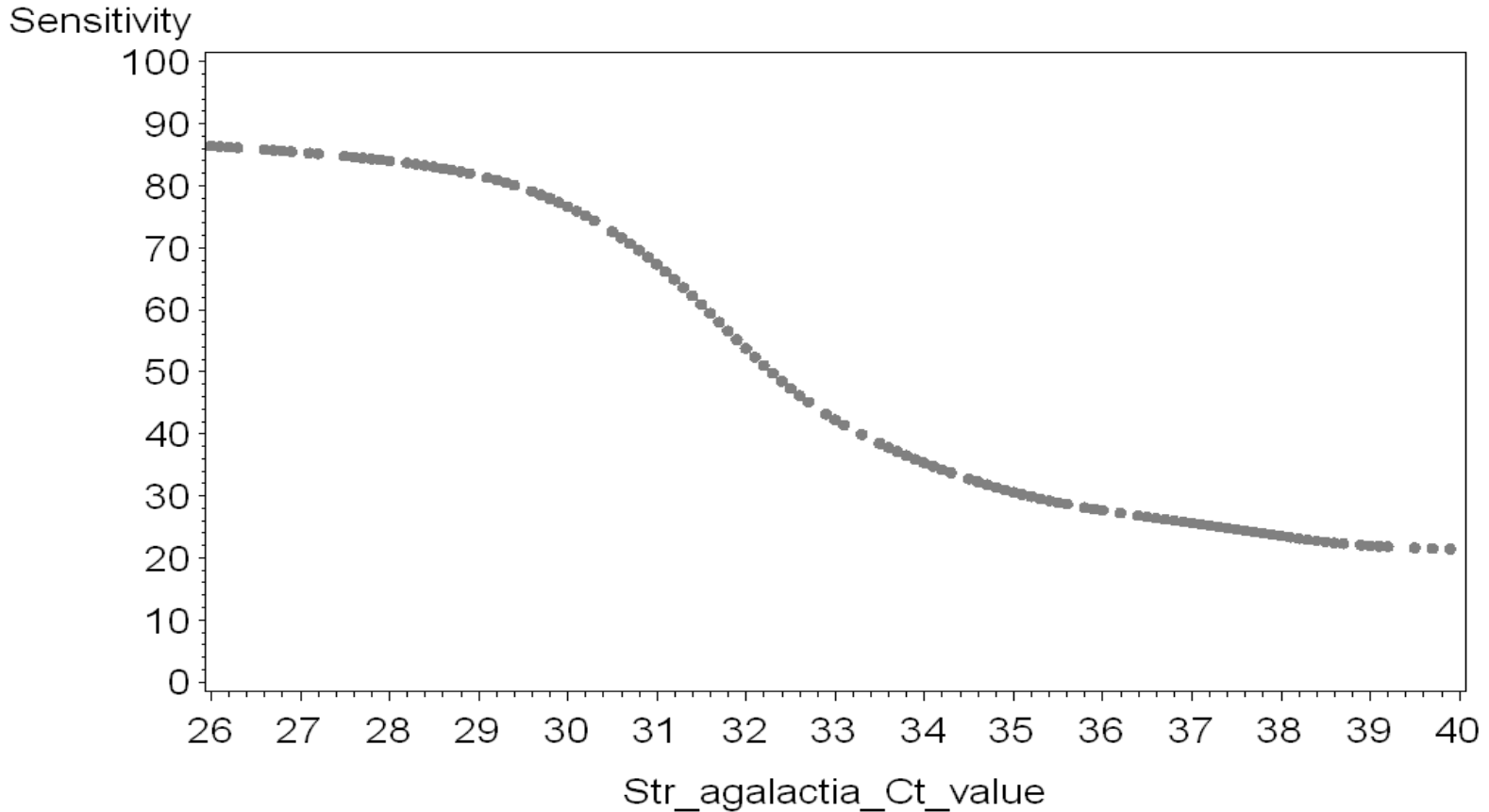
Bacteria gene	NoCt	Median (of herds with ct<40)
<i>Staph aureus</i>	9	32.5
<i>Staph spp</i>	0	29.8
<i>Beta lactamase</i>	22	34.8
<i>Str. agalactiae</i>	93	31.5
<i>Str. dysgalactiae</i>	14	31.6
<i>Str. uberis</i>	5	30.3
<i>Klebsiella spp</i>	87	36.5
<i>E. coli</i>	39	35.8
<i>Coryne bovis</i>	10	33.7

Distribution of Ct values



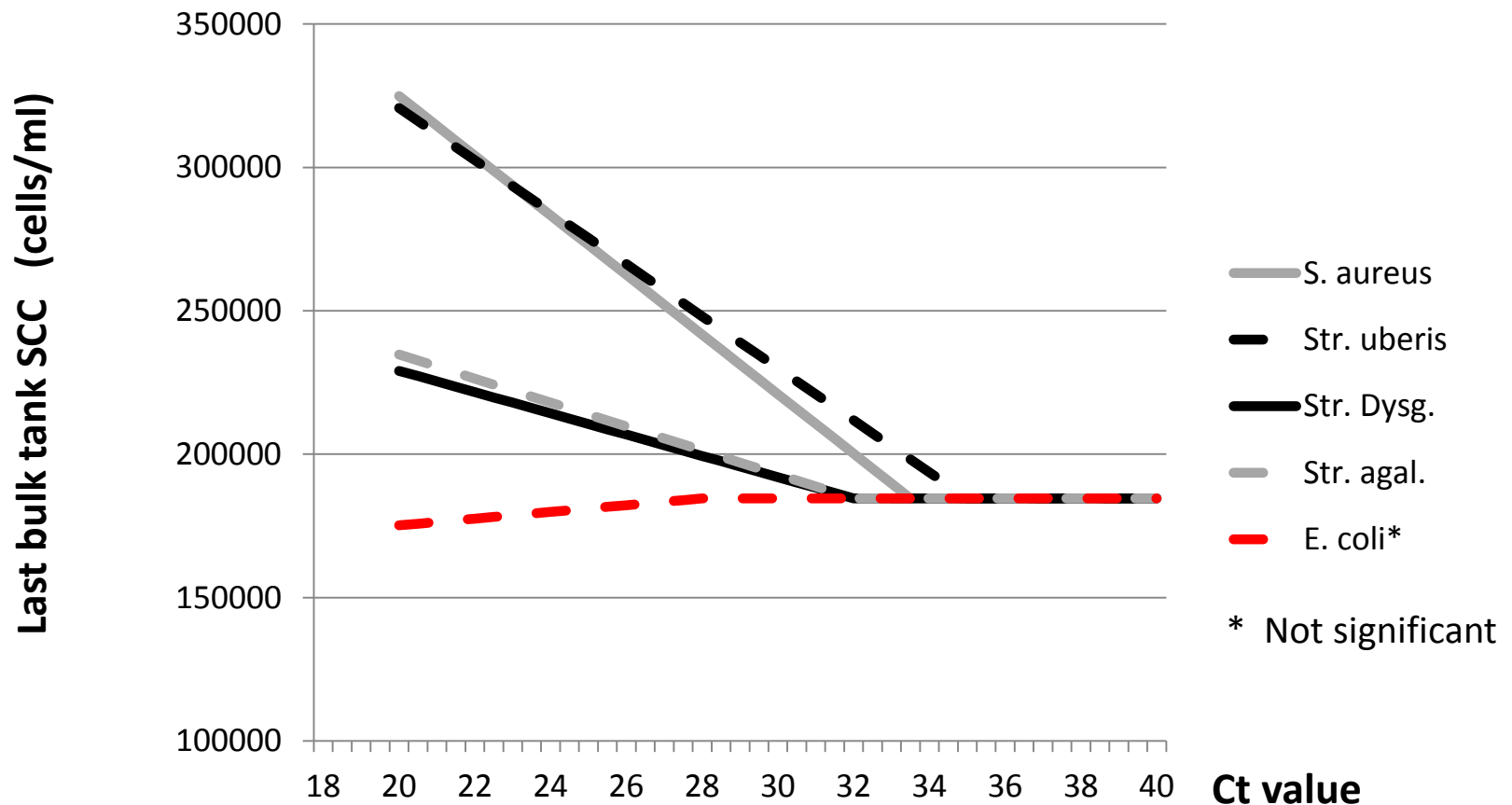
(Ct=40 for *Str. agalactiae* = 3928 outside axis)

The sensitivity of traditional culture compared to real-time PCR highly related to the Ct-value (correlated to bacterial concentration)



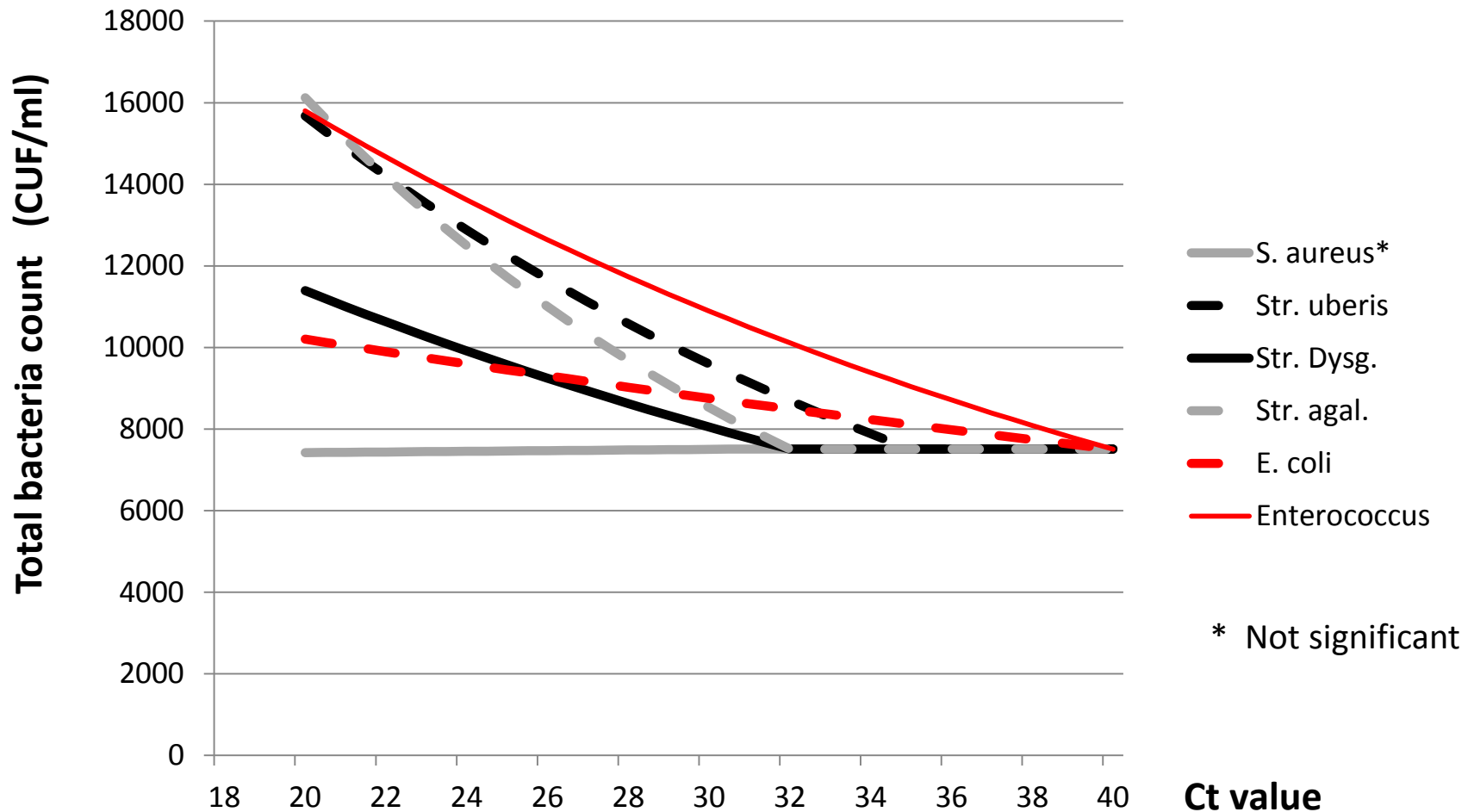
(Curve smoothed using a Generalized additive model)

Low Ct values was associated with higher Bulk tank somatic cell count



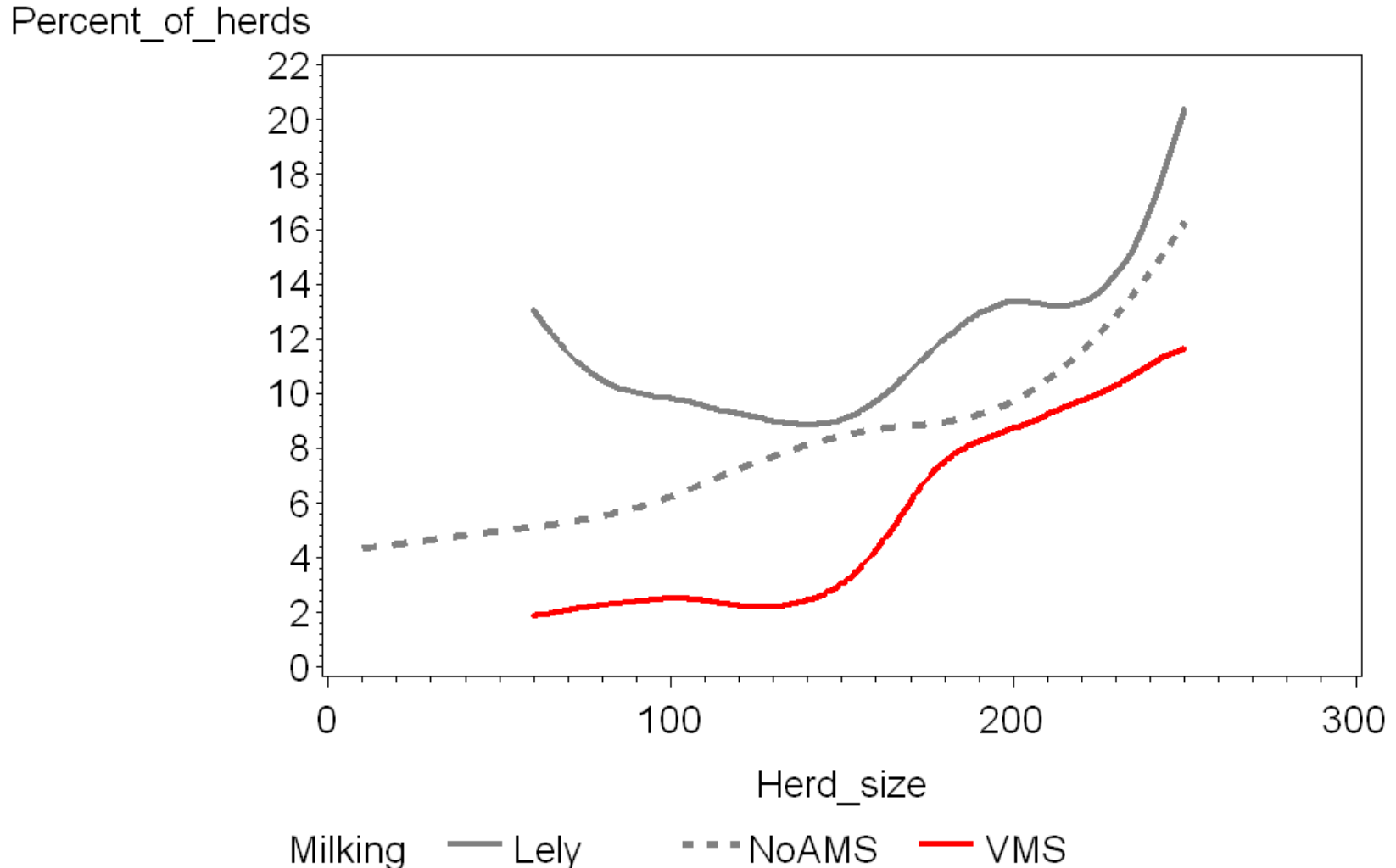
Output from combined mixed linear model – estimate for each bacteria

Low Ct values was associated with higher total bacteria count



Output from combined mixed linear model – estimate for each bacteria

Prevalence of *Str. agalactiae* increased with herd size depending on milking system.



(Curve smoothed using a Generalized additive model)

Production system and *Str. agalactiae*

- Significantly fewer organic herds were positive for *Strep. agalactiae* compared to conventional herds (2.6 % compared to 8.2%).
- Only one out of 41 organic herds with AMS had a positive reaction for GBS (2.4 %).
- Not related to difference in herd size.



Use of Real time PCR on bulk tank milk

- Low ct values of major mastitis pathogens are related to reduced milk quality
- Real time PCR are more sensitive than bacteriological culture in detecting *Str. agalactiae* in the bulk tank

