



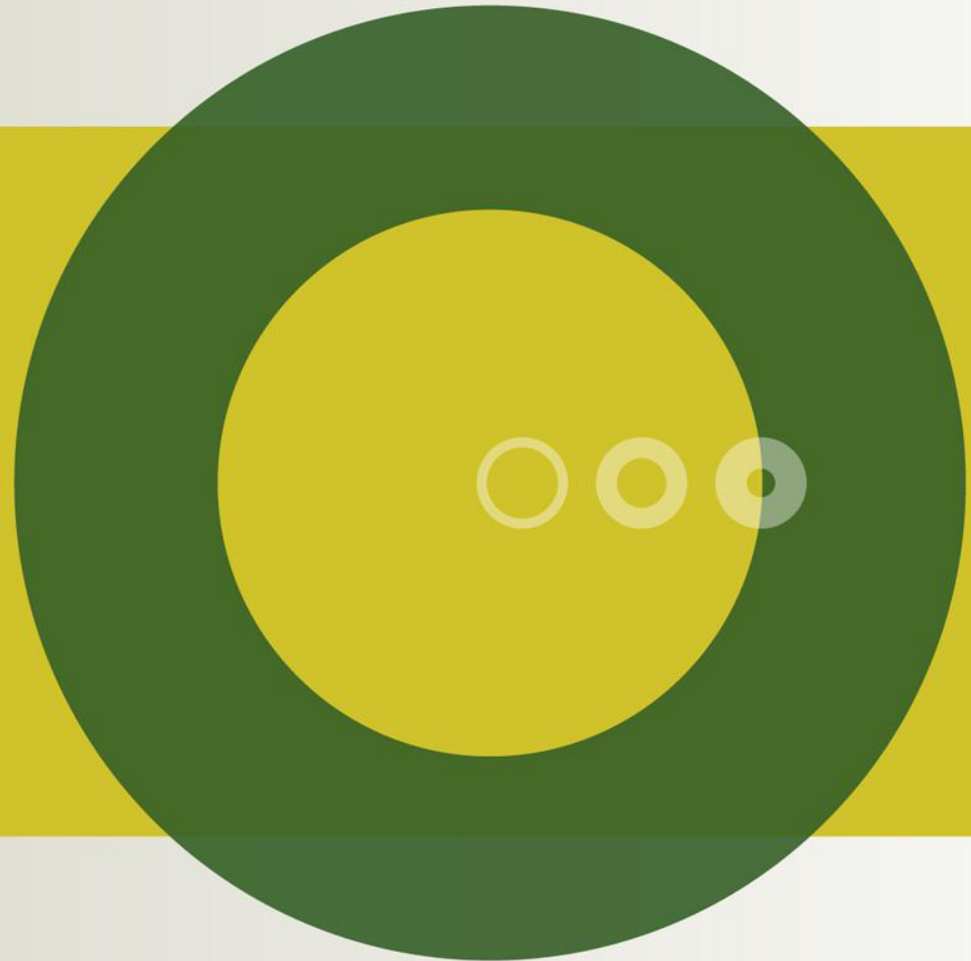
VIDENCENTRET FOR LANDBRUG



Mælke kvalitetskampagne Fornuftig brug af antibiotika og status PCR

Møde 24 august 2011
Svensk Molk

Dip ECBHM
Jørgen Katholm





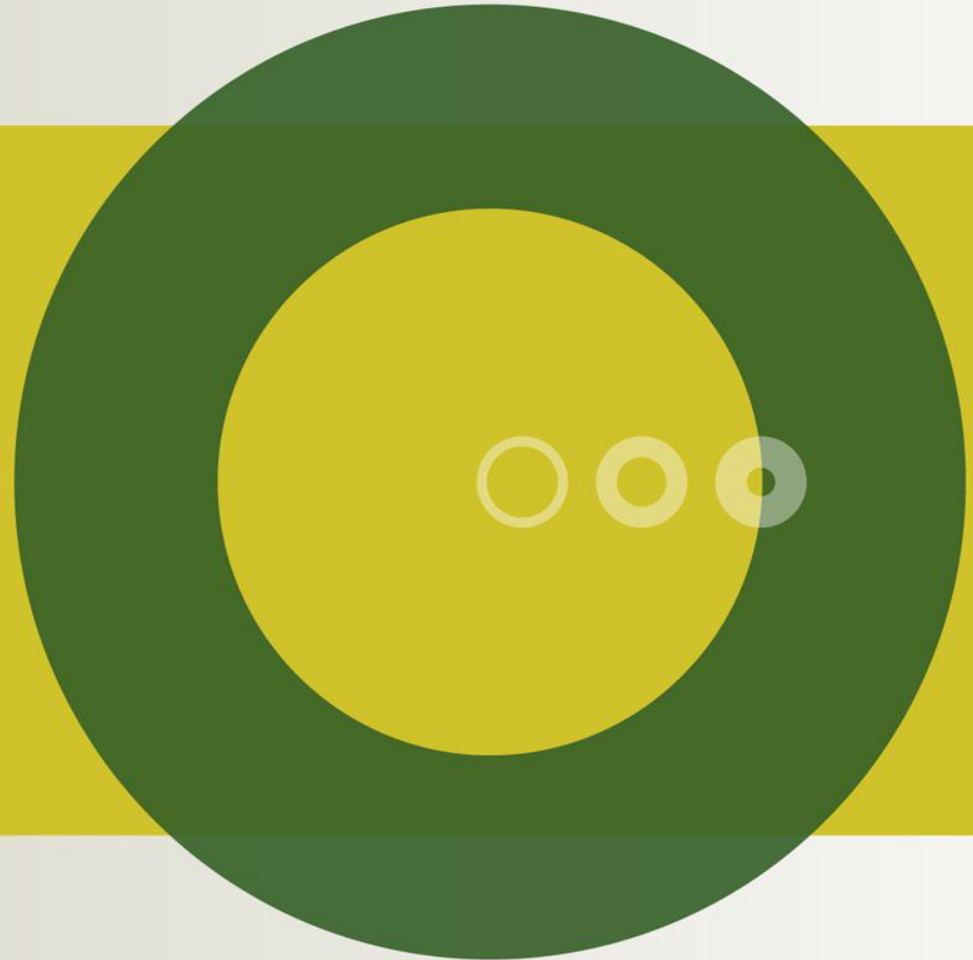
VIDENCENTRET FOR LANDBRUG

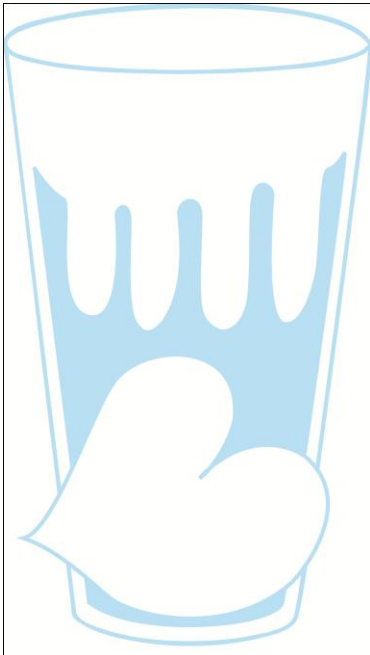


Mælke kvalitetskampagne Fornuftig brug af antibiotika og status PCR

Møde 24 august 2011
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Dip ECBHM
Jørgen Katholm





Vores Mælk

- en ren fornøjelse

Udvikling i Mælke kvalitet 2010

| | | | |
|----------------------|------|------------|-----------|
| ○ Celletal | 2009 | 235.300 | |
| | 2010 | 231.500 | BARE FLOT |
| ○ Hæmstofuheld | | 15 % færre | BARE FLOT |
| ○ Tuber bredspektret | | 30% færre | BARE FLOT |
| ○ B-streptokokker | | 0,1% færre | BARE FLOT |

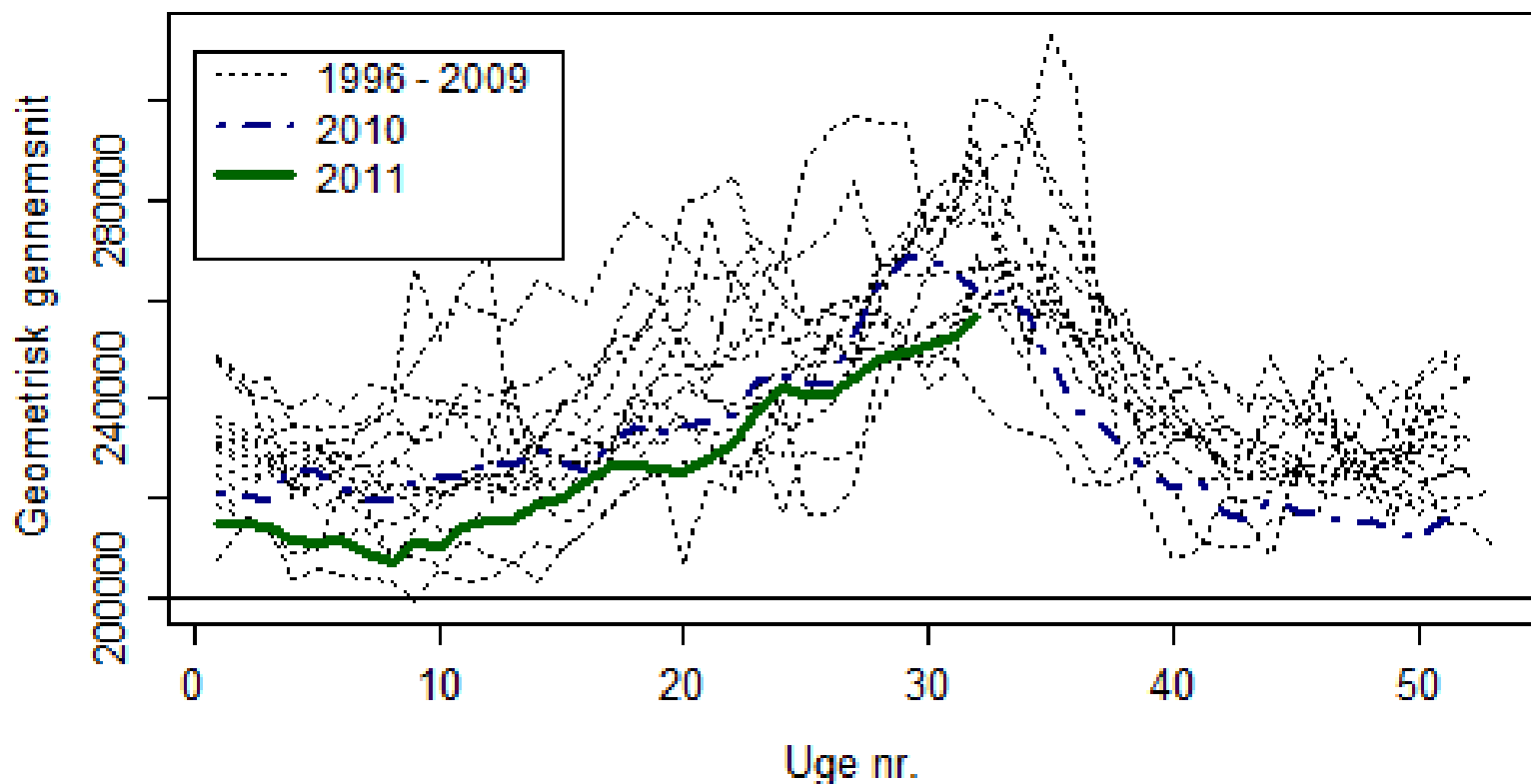
Udvikling i tankcelletal

| | 2011 | 2010 | 2009 |
|-------|---------|---------|---------|
| jan | 214.000 | | |
| feb | 209.600 | | |
| marts | 213.500 | 225.000 | |
| april | 221.400 | 228.000 | |
| maj | 226.200 | 234.400 | |
| Juni | 238.700 | 242.300 | |
| Juli | 247.400 | 260.700 | |
| Aug | | 260.900 | |
| sep | | | |
| okt | | 219.900 | |
| nov | | 217.200 | |
| dec | | 214.300 | 219.800 |

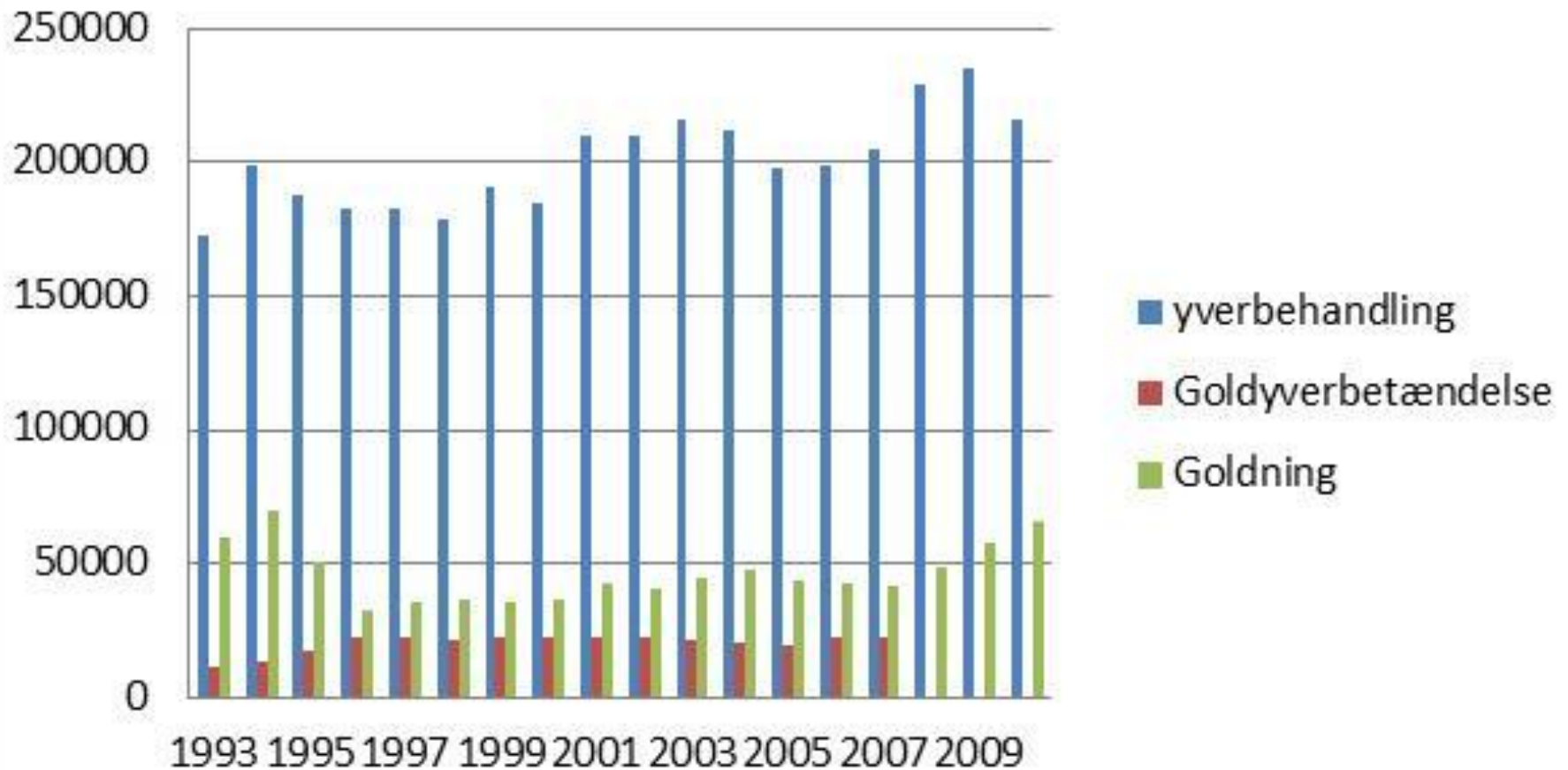
Tankcelletal alle besætninger

1996 – 2011 (6 mdr under 220.000 feb. 209600, marts 213.200)

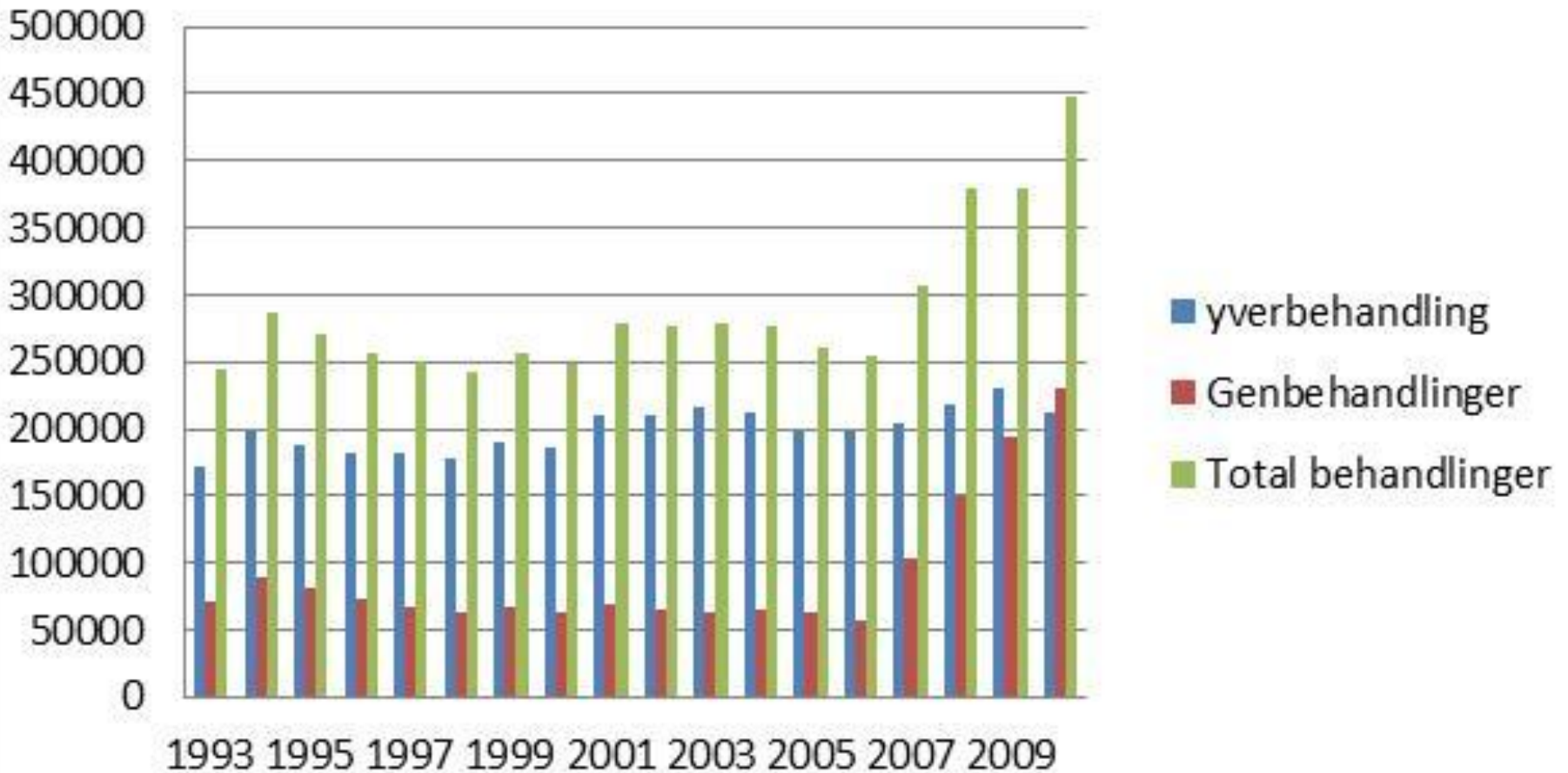
Udvikling i celletal



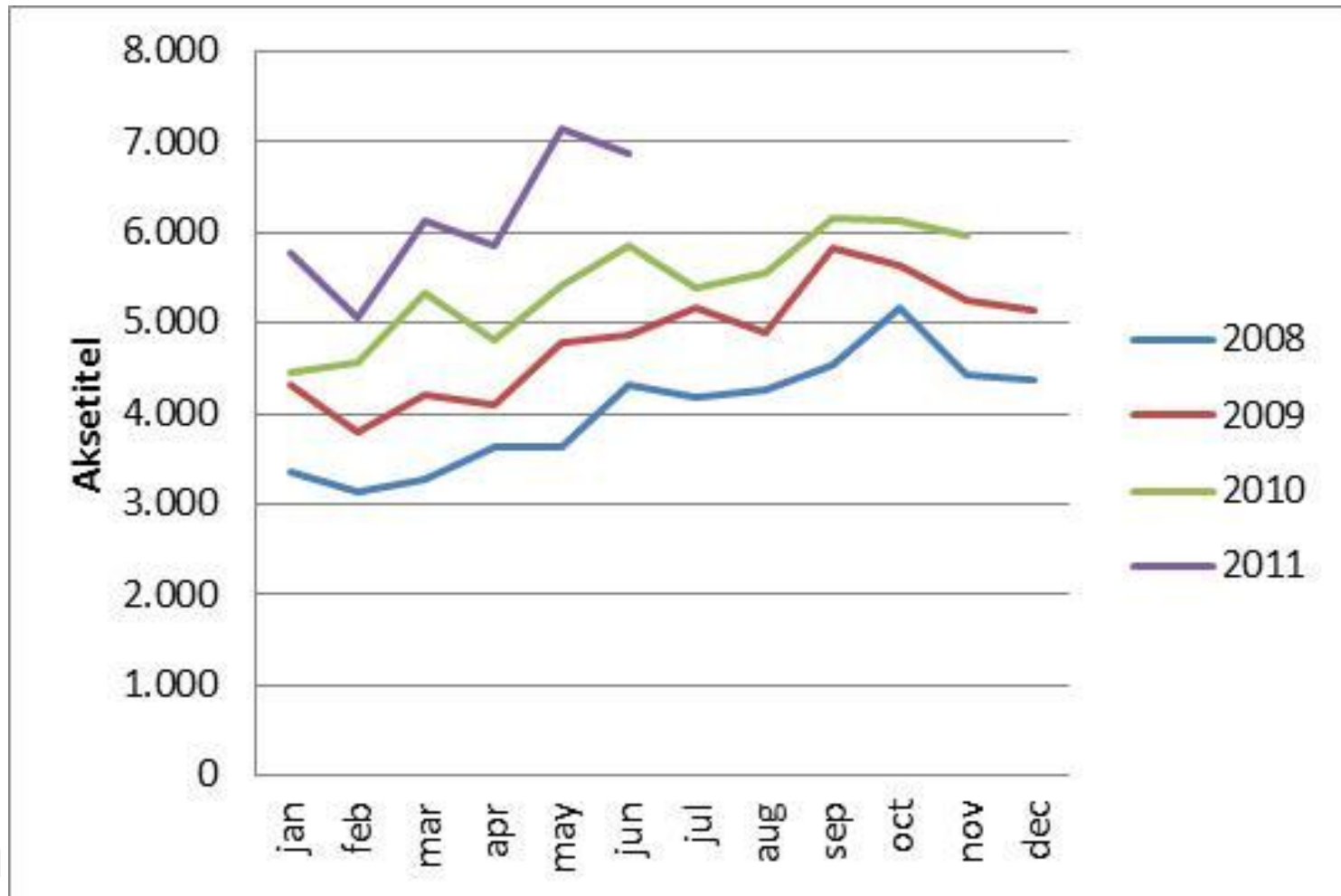
Tilfælde af yverlidelser 1993 - 2010



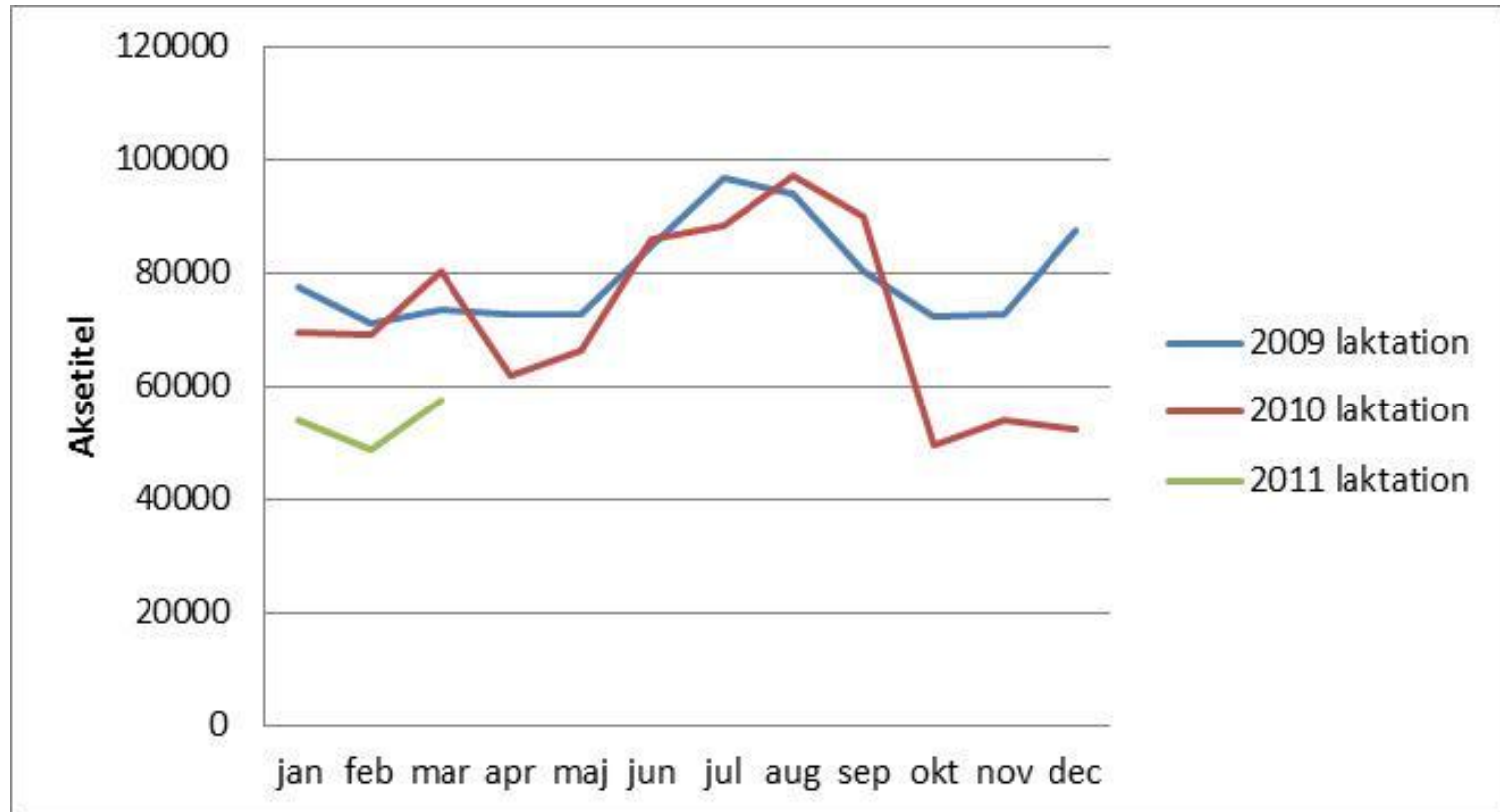
Tilfælde af yverlidelser 1993 - 2010



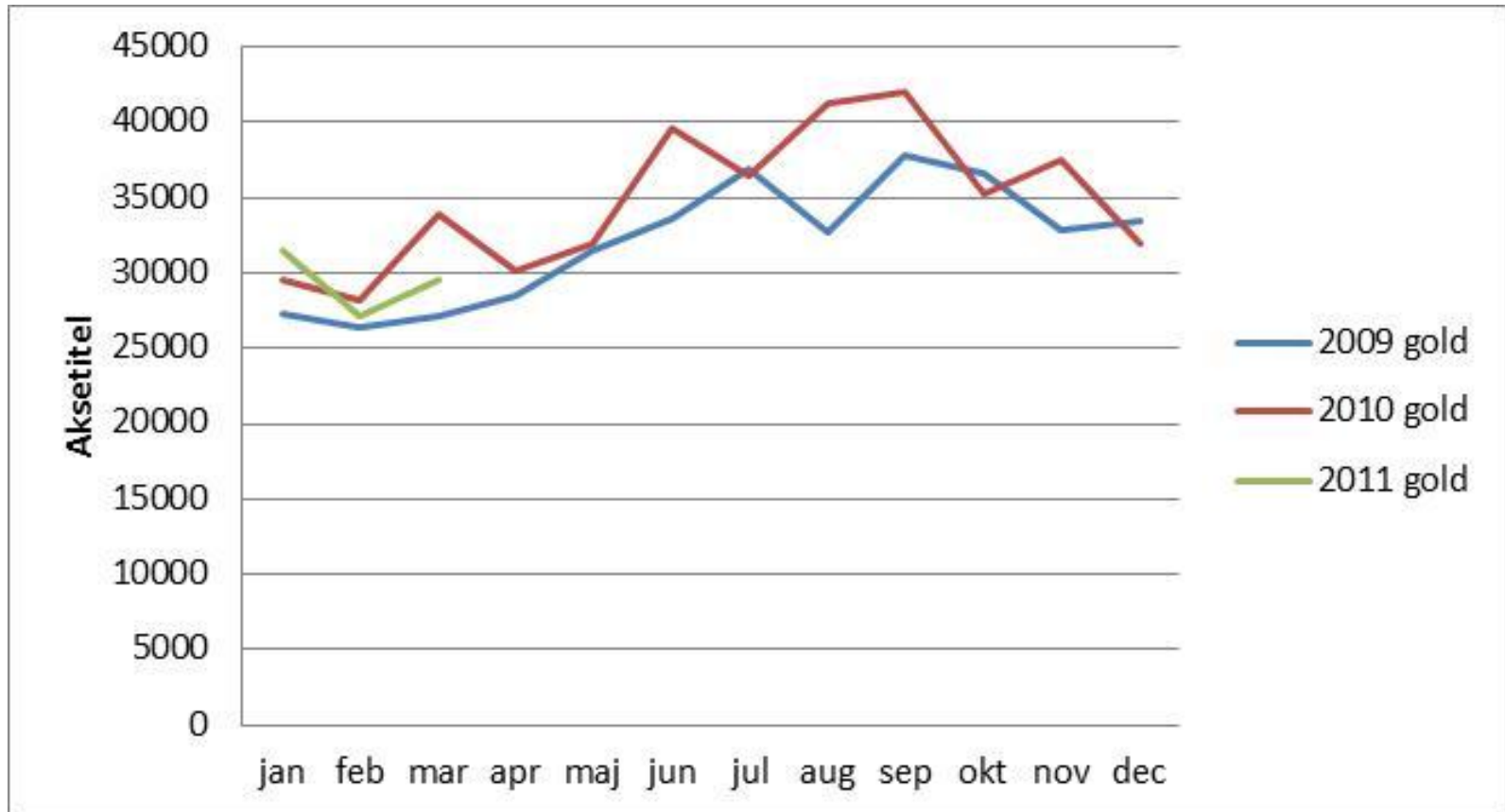
Goldko behandlinger



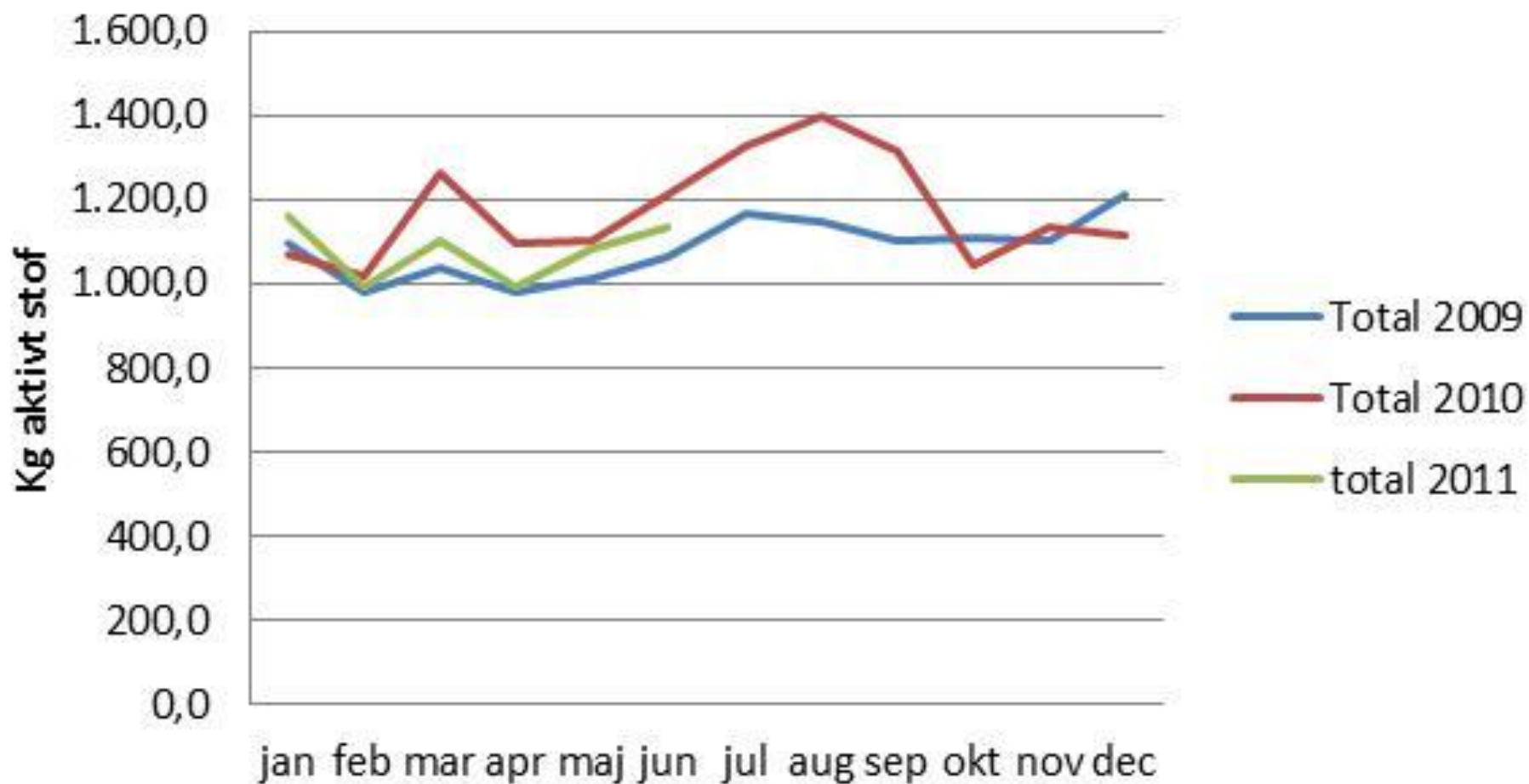
Intramammarier Laktation Vetstat



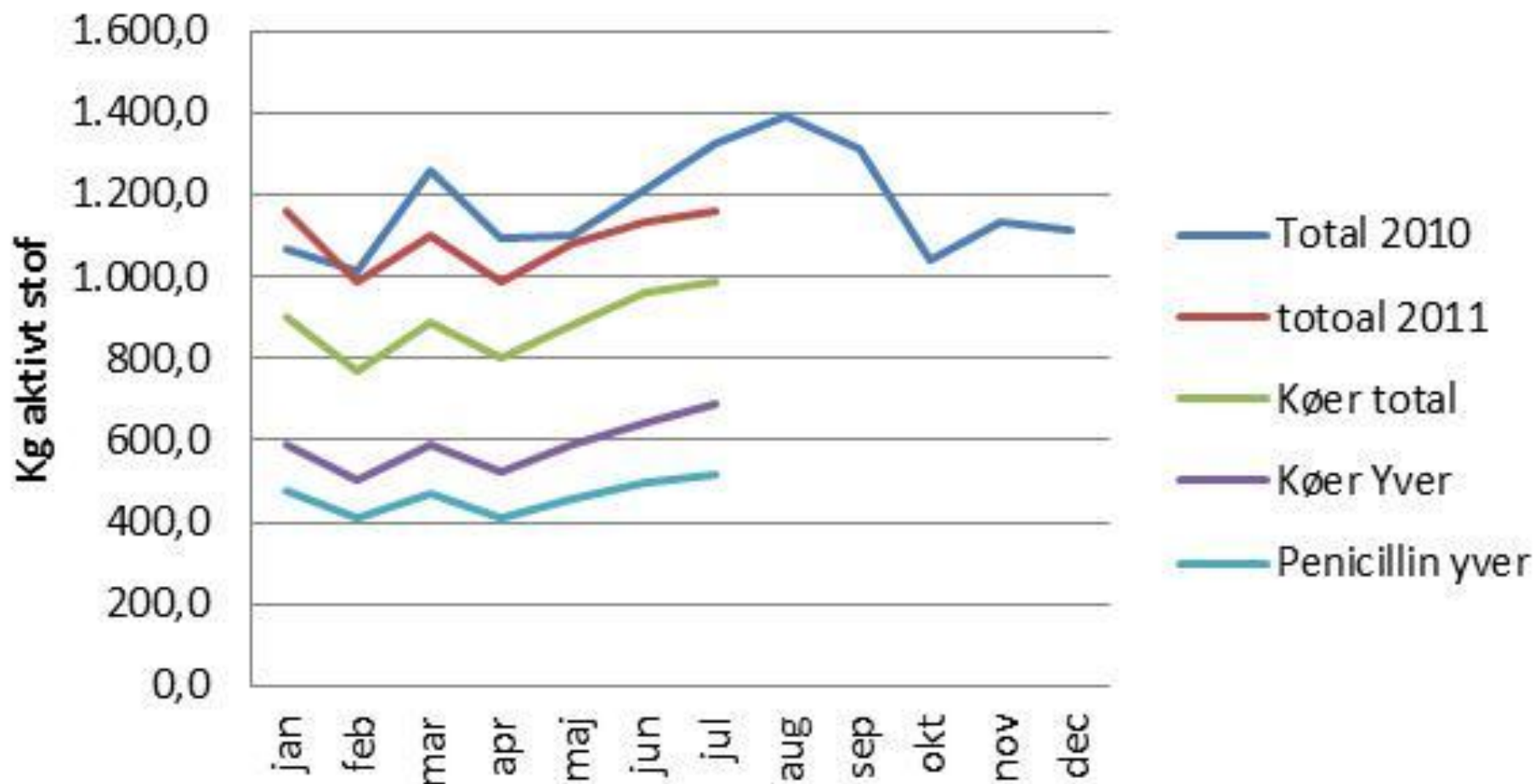
Intramammarier Gold Vetstat



Antibiotika til Kvæg kg aktivt stof



Antibiotika til kvæg kg aktivt stof



Udvikling behandlinger 2011 første halvår

- | | | |
|---------------------------------|----------|-----|
| ○ Goldbehandlinger | Stigning | 21% |
| ○ Start behandlinger mastitis | Fald | 18% |
| ○ Total registreringer mastitis | Fald | 2% |

Antibiotikaforbrug 1 halvår

| | 1 halvår 2010 | 1 halvår 2011 | reduktion |
|-----------------------|---------------|---------------|-----------|
| Totalt kg aktivt stof | 6.749 | 6.454 | 4,4% |
| Totalt til køer | 5.406 | 5.207 | 3,7% |
| Total til yver | 3.585 | 3.431 | 4,3% |
| % penicillin total | 55% | 56% | |
| % til køer af total | 80% | 81% | |
| % til yver af køer | 66% | 66% | |
| % penicillin af yver | 77% | 79% | |

Grænseværdier medicin og dødelighed

Læs mere her om muligheden for 'straks-oprykning' til Almindelig rådgivning

Grænseværdier for kvæg- og svinebesætninger fra 1. sept. 2010:

| | Kvæg | | Svin | | |
|---|---------------------------------------|---|--|---|---|
| | Køer | Kalve | Søer | Smågrise | Slagtesvin |
| Antibiotikaforbrug i ADD¹ pr. 100 dyr pr. dag | 2,1 ADD pr. 100 køer pr. dag | 1,2 ADD pr. 100 kalve pr. dag | 5,2 ADD pr. 100 søer pr. dag | 28 ADD pr. 100 smågrise pr. dag | 8 ADD pr. 100 slagtesvin pr. dag |
| Dødelighed i procent | 14 % | 20 % | 24 % | Indføres senere | Indføres senere |

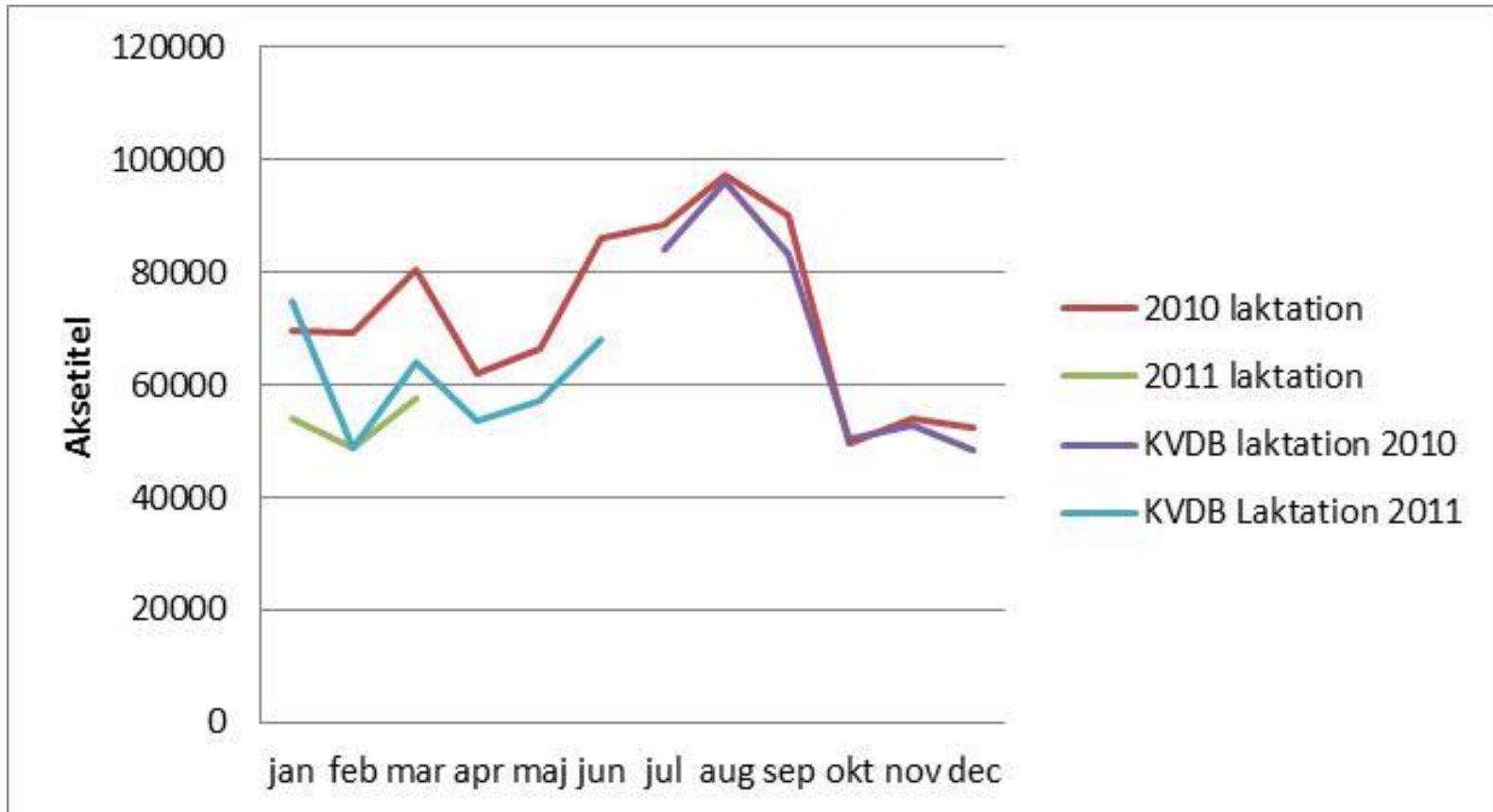
¹⁾ ADD er daglig dosis til et dyr ifølge medicindatabasen VetStat.

Forslag omkring mulig grænseværdi kalve 0 – 12 mdr ???

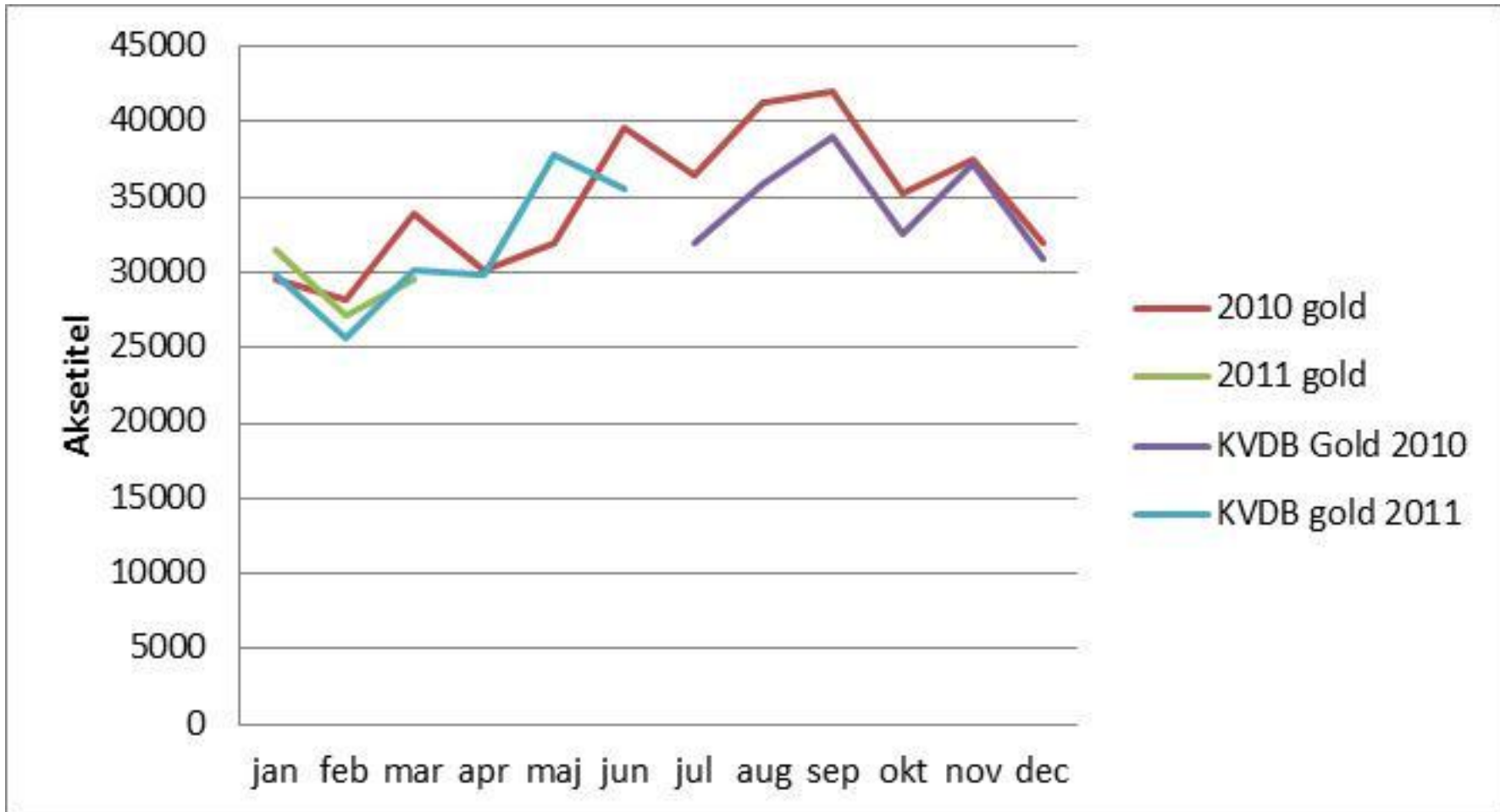
Antibiotika goldning og patteforsegling

| Behandling og | ingen | AB | IPF | Både |
|--------------------------|---------|--------|-------|------|
| Antal goldperioder | 282.162 | 51.834 | 4.545 | 818 |
| % raske inden goldning | 64 | 49 | 74 | 46 |
| % raske efter kælvning | 60 | 69 | 61 | 75 |
| % nyinficerede af raske | 34 | 24 | 34 | 22 |
| % kurerede af inficerede | 47 | 63 | 46 | 71 |

Intramammarier laktation vetstat og kvægdatabase



Intramammarier Gold vetstat og kvægdatabase



Milk Quality and Mastitis

(Danish Cattle Federation)

Surveillance of mastitis pathogens PCR bulk tank

Detection of subclinical infections

Individual cow test by PCR at DHI (Dairy Herd Improvement) samples

Eradication programs (*Streptococcus agalactiae* - B)

Individual cow test by PCR at DHI samples segregation, therapy and slaughter

All results reported to Danish Cattle Database

Milk Quality and Mastitis

(Danish Cattle Federation)

| | |
|------------------------------------|---|
| Surveillance of mastitis pathogens | PCR bulk tank. |
| 2009 | All herds tested. |
| 2010 | All herds tested. |
| 2011 | Plan test of all herds + evt. Mycoplasma. |

By law all cows before dry off must be tested and found positive of infection to use dry cow therapy.

In 2011 so far around 20.000 cows tested by individual cow PCR at DHI samples.

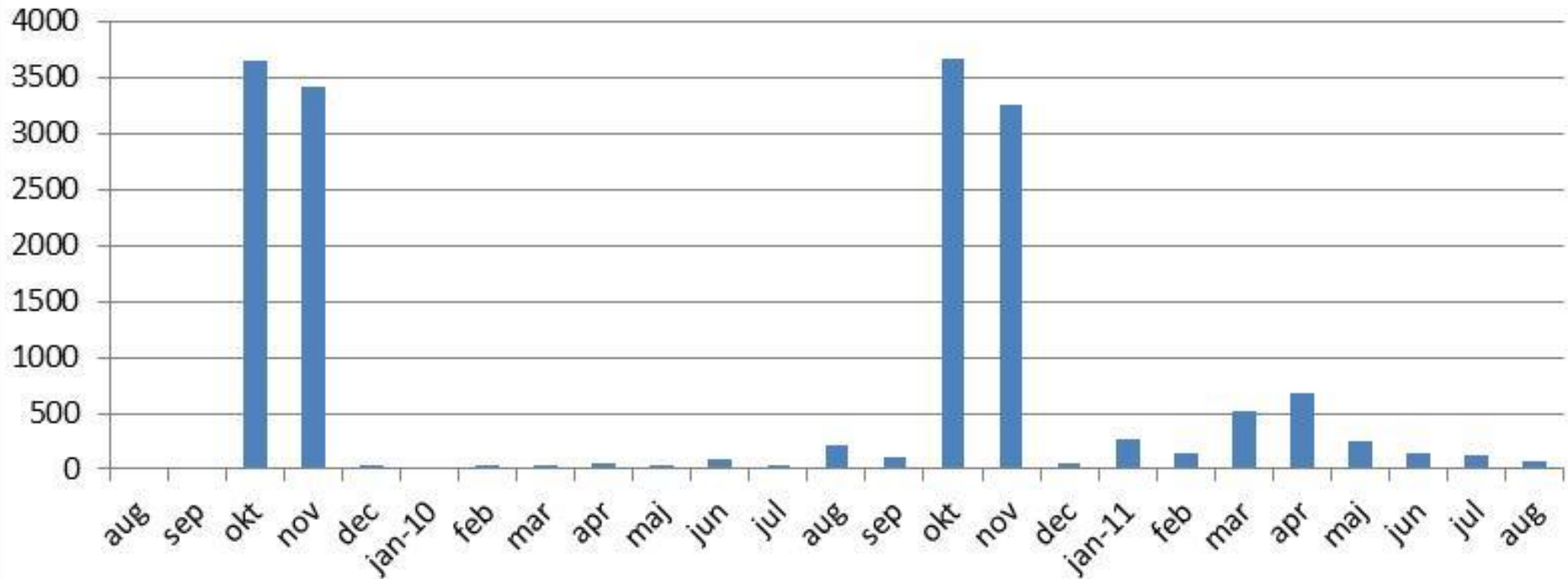
PCT bulk tank samples

2009 - 7099

2010 - 7603

2011 - 2200

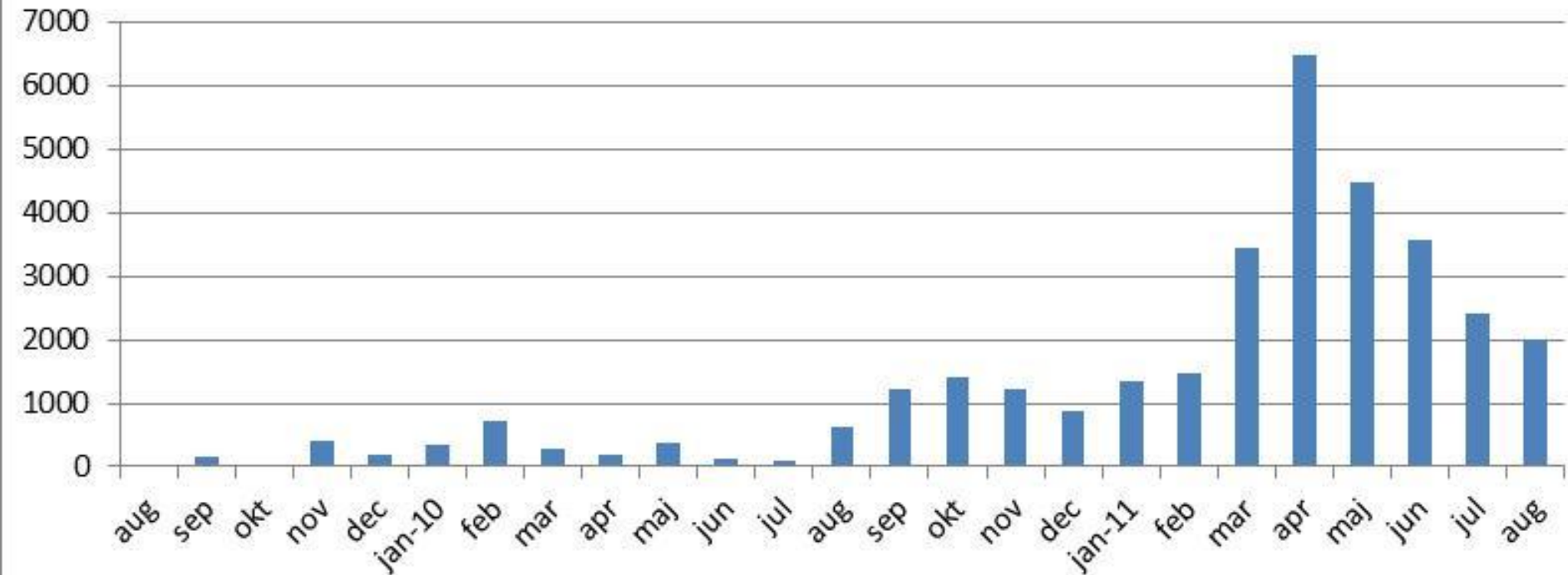
PCR bulk tank samples DK



PCT individual cow samples

2009 – 848
2010 – 7468
2011 – 25139

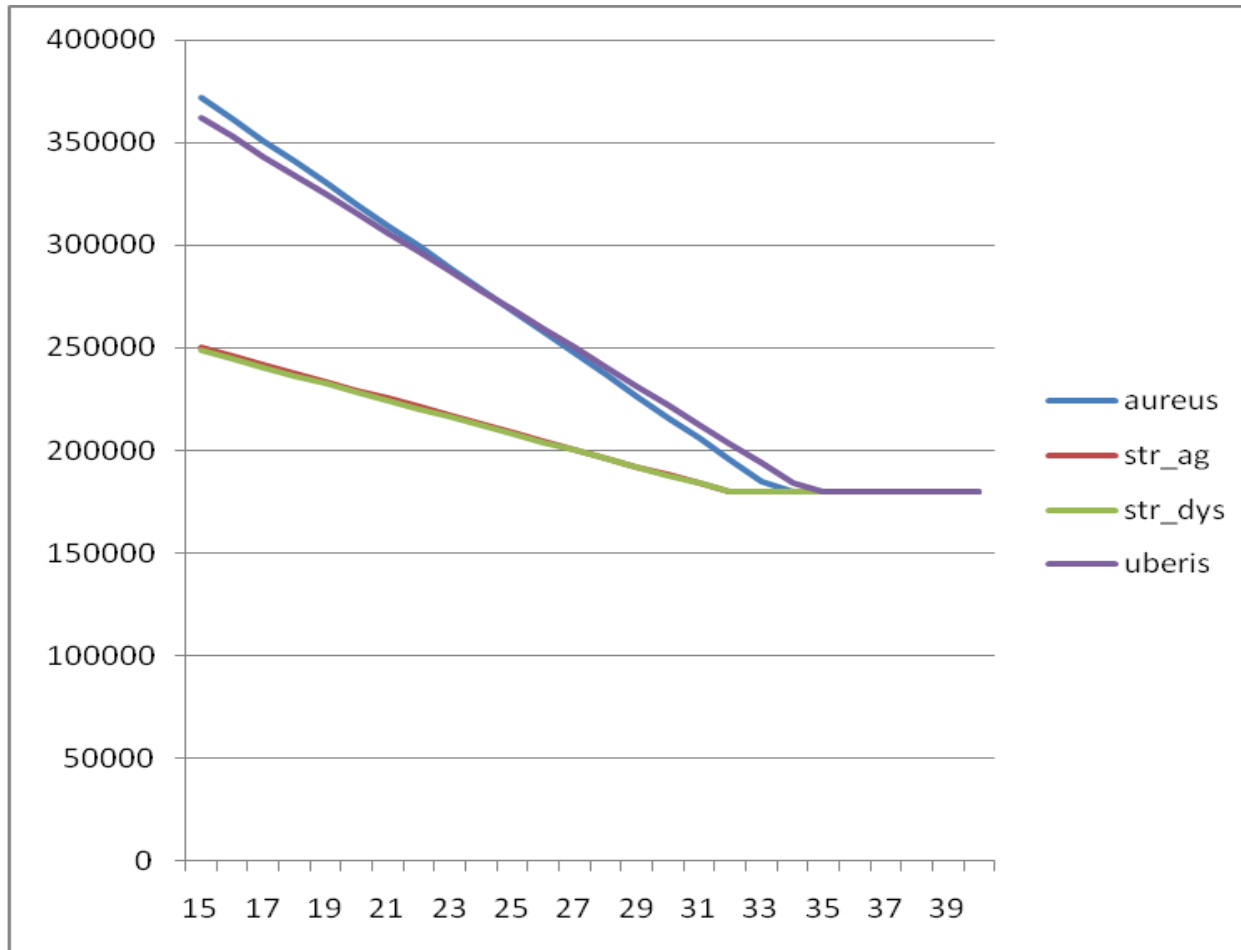
PCR individual cow samples DK



Last Bulk tank cellecount befor PCR test

Correlation between cellcount and Ct value

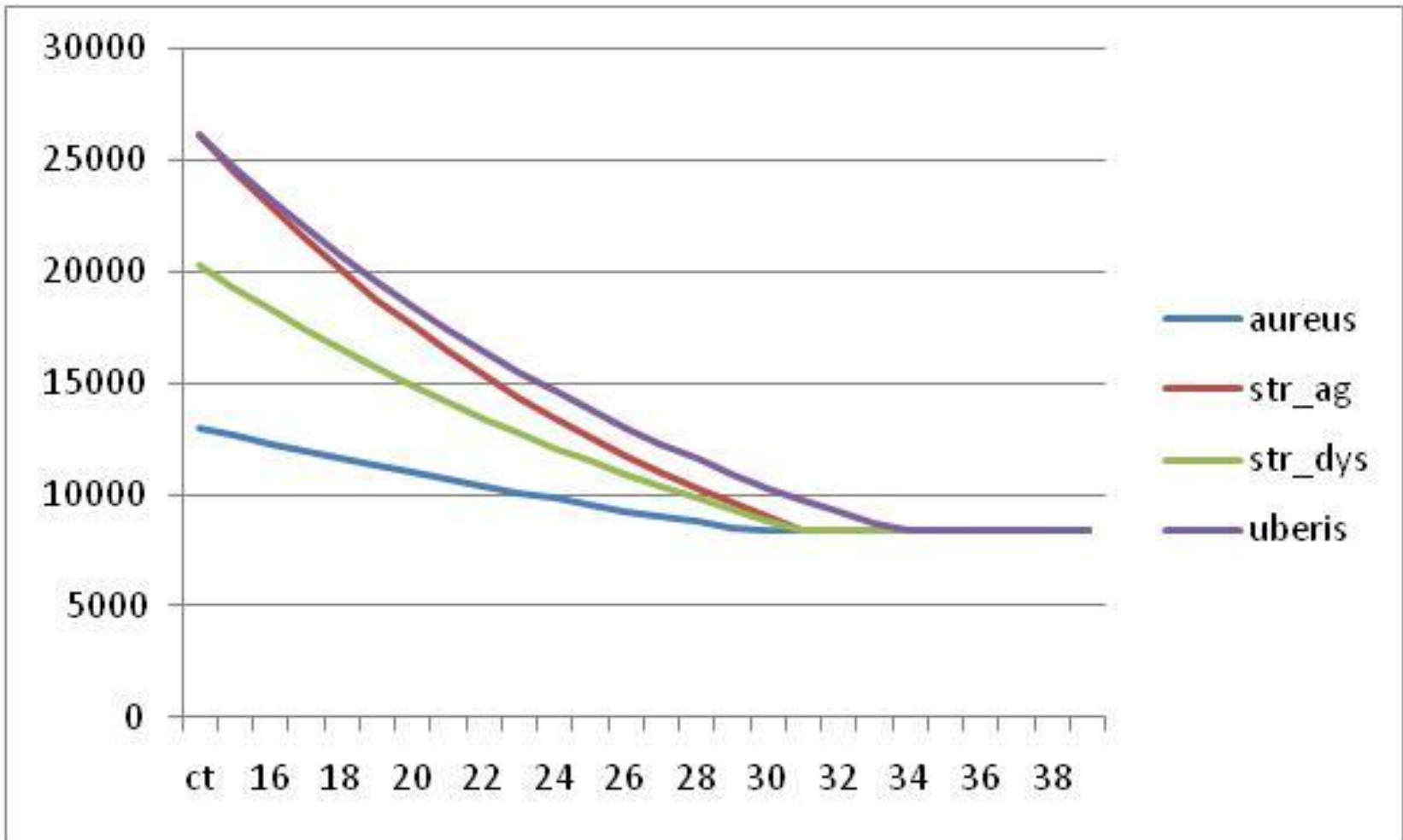
Specialy Staph aureus and strep uberis



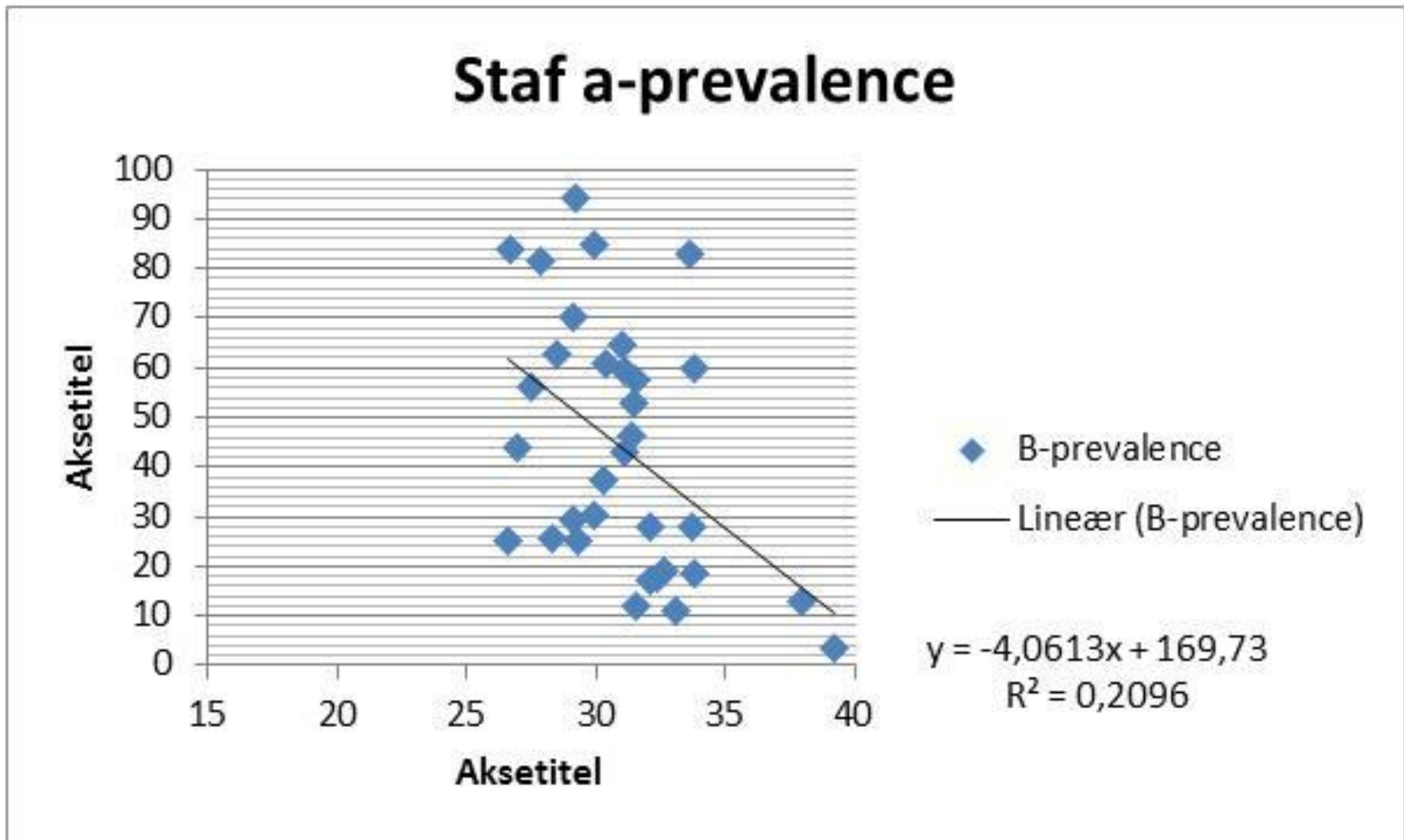
Max Total bakteria count befor PCR test

Correlation between total bacterial count and Ct value

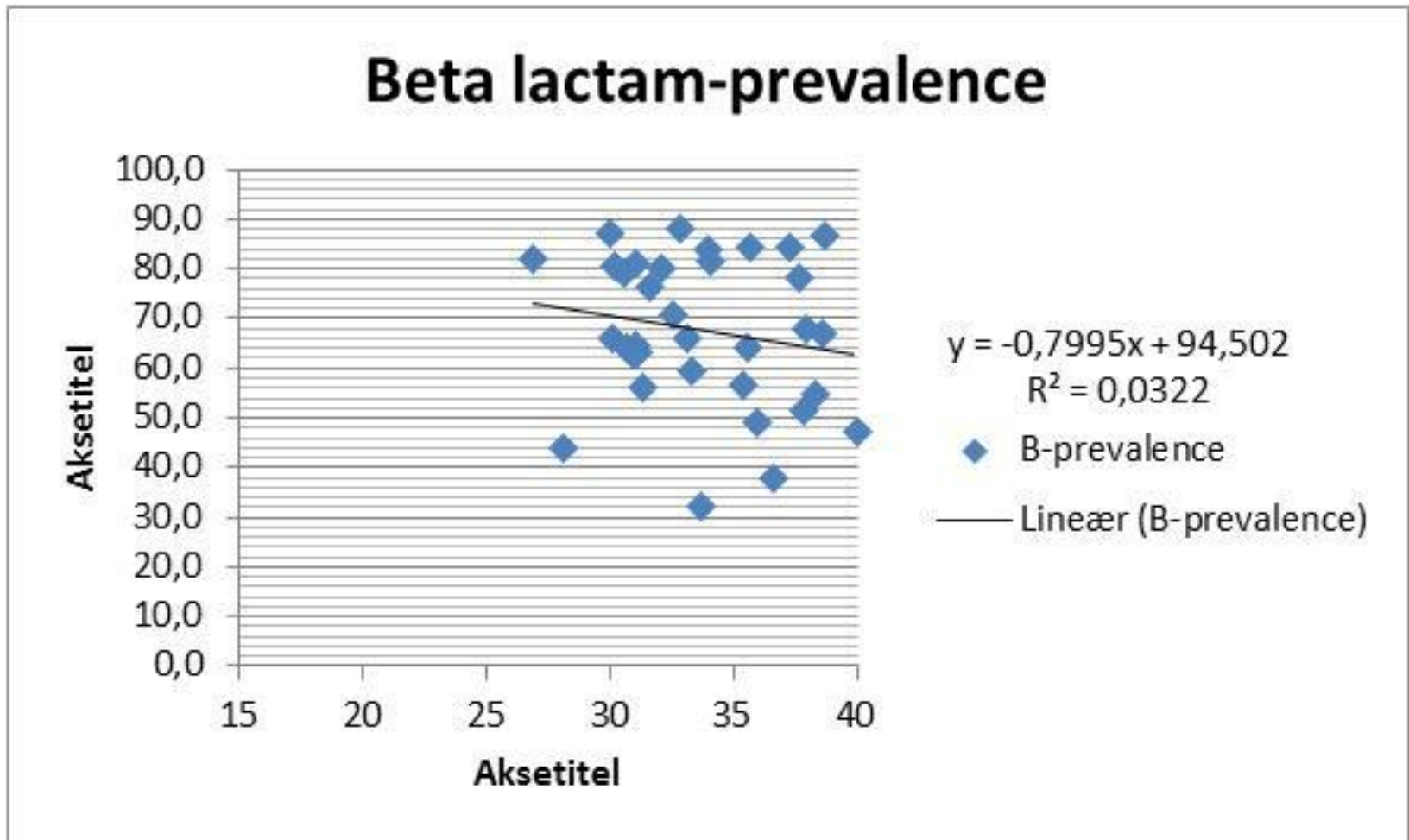
Specialy Strep uberis and agalactiae



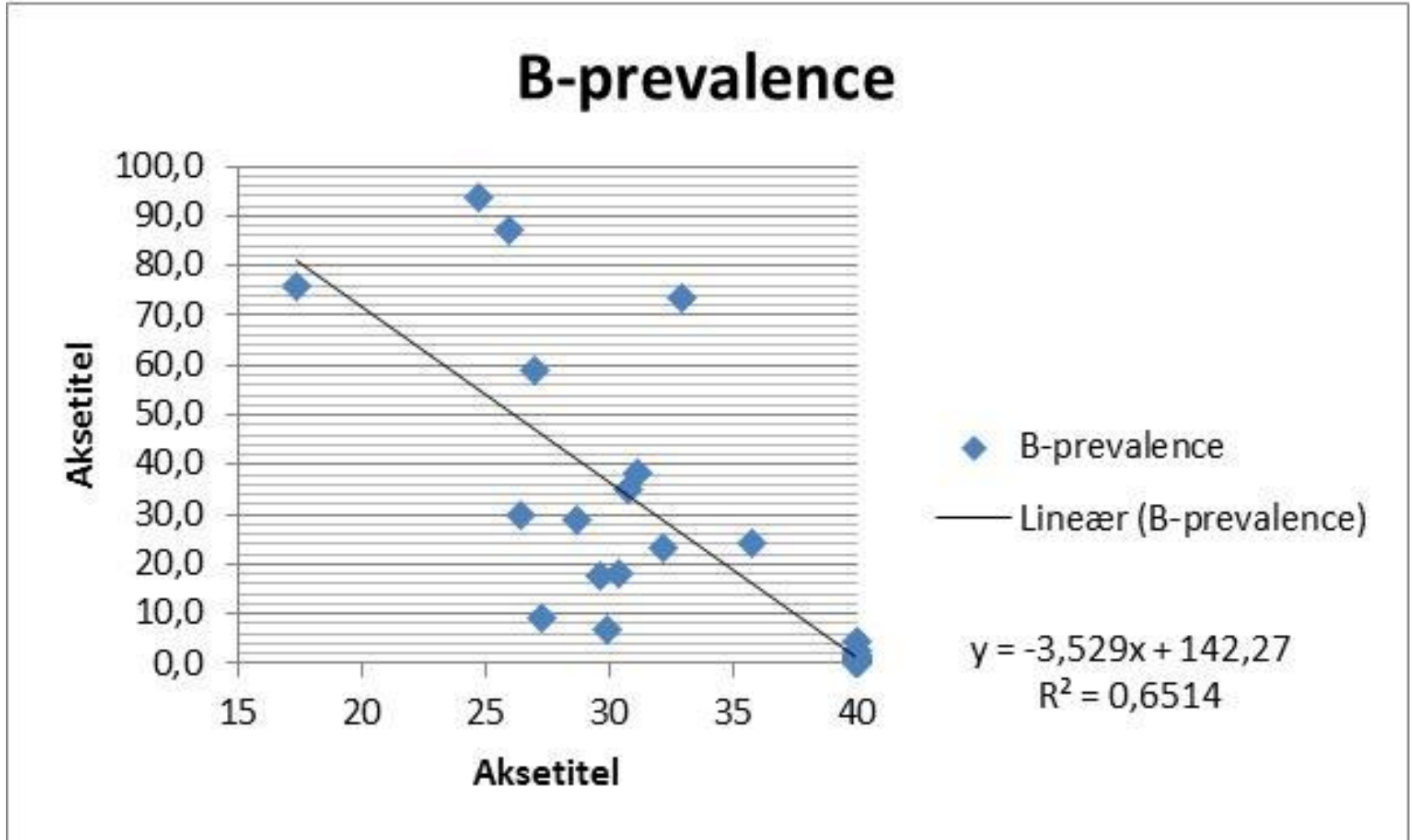
Tankmælk Ct værdi og Ko prævalens



Tankmælk Ct værdi og Ko prævalens

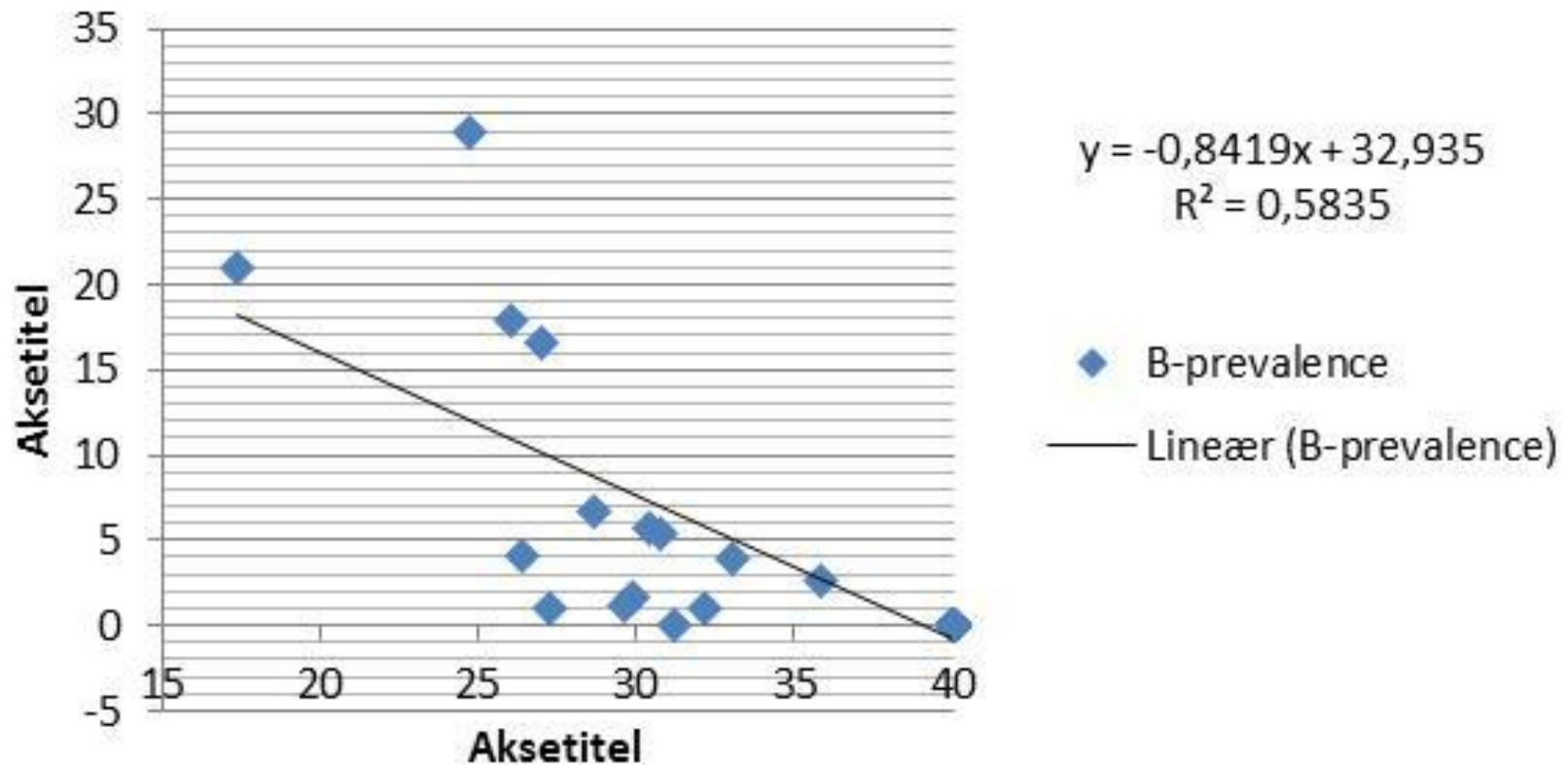


Tankmælk Ct værdi og Ko prævalens

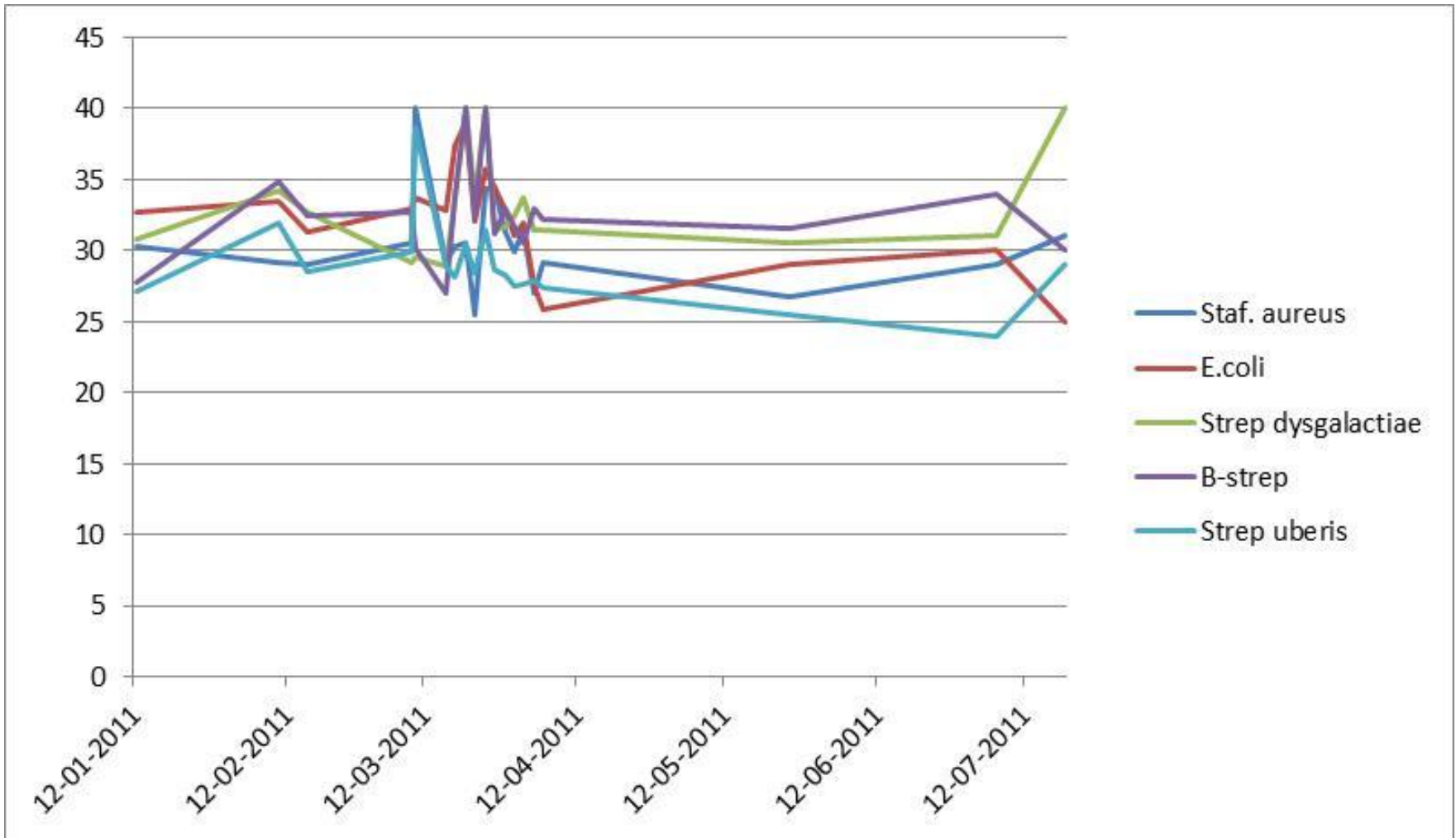


Tankmælk Ct værdi og Ko prævalens

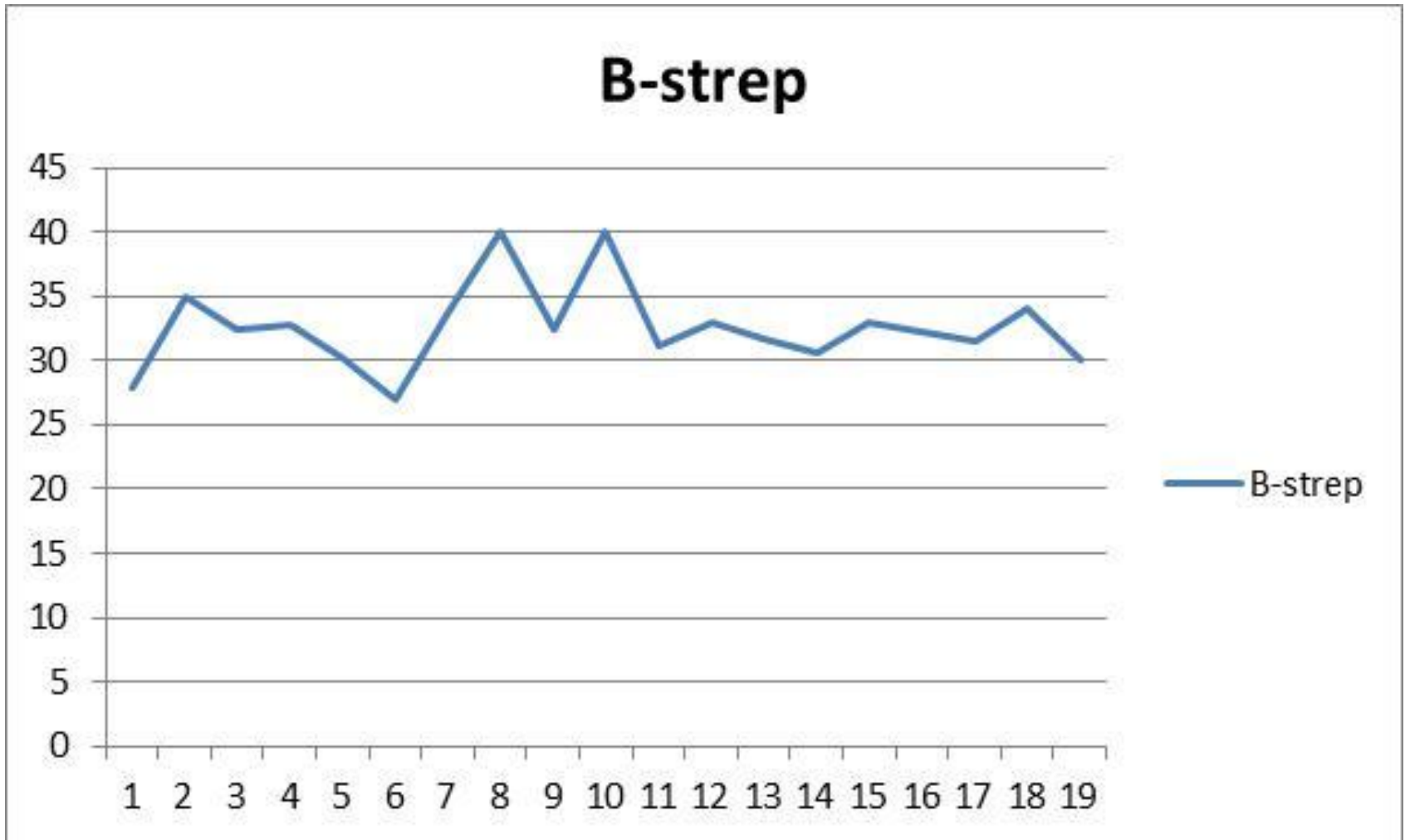
B-prevalence under 30



Variation fra dag til dag



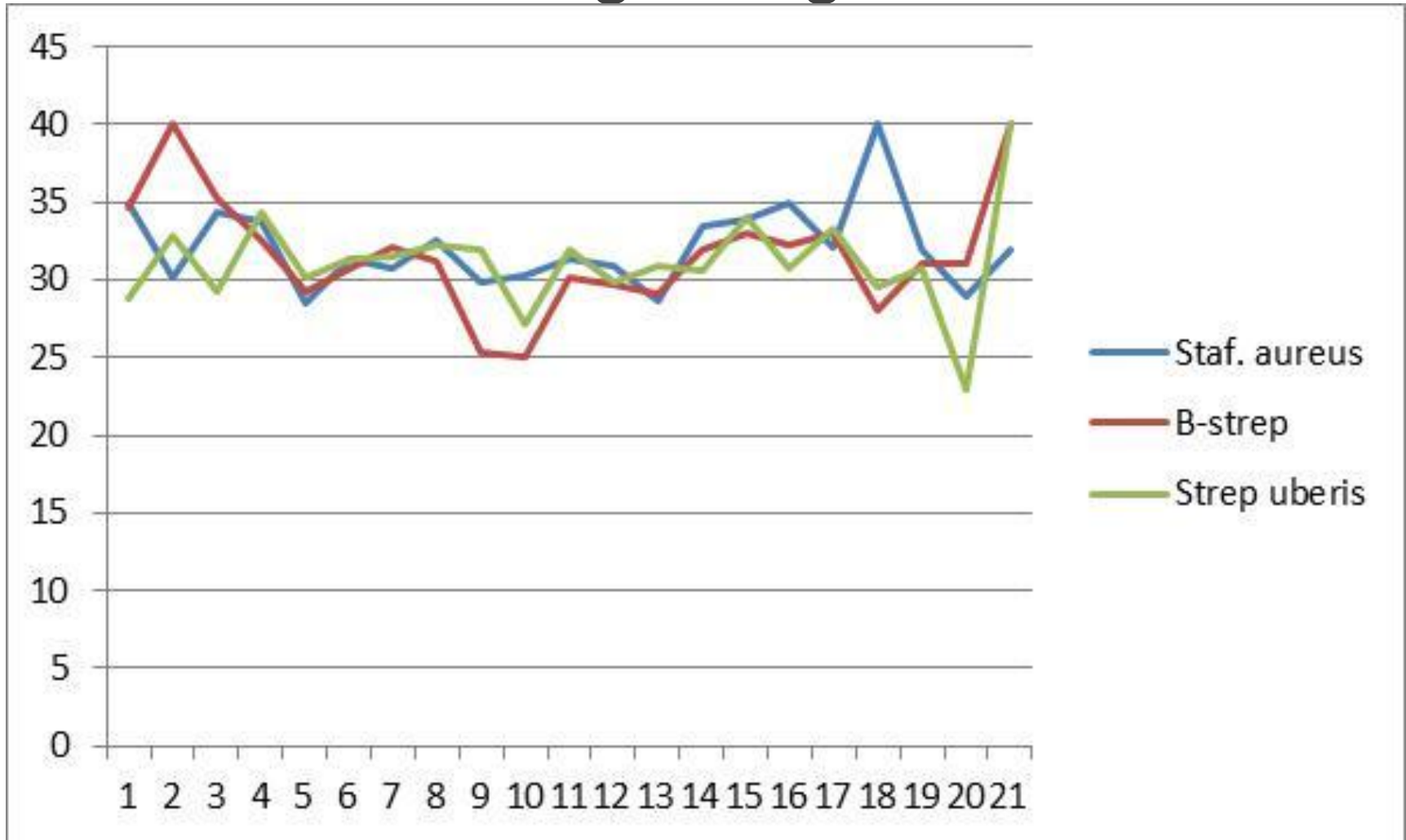
Variation fra dag til dag 15277



Variation fra dag til dag 21058

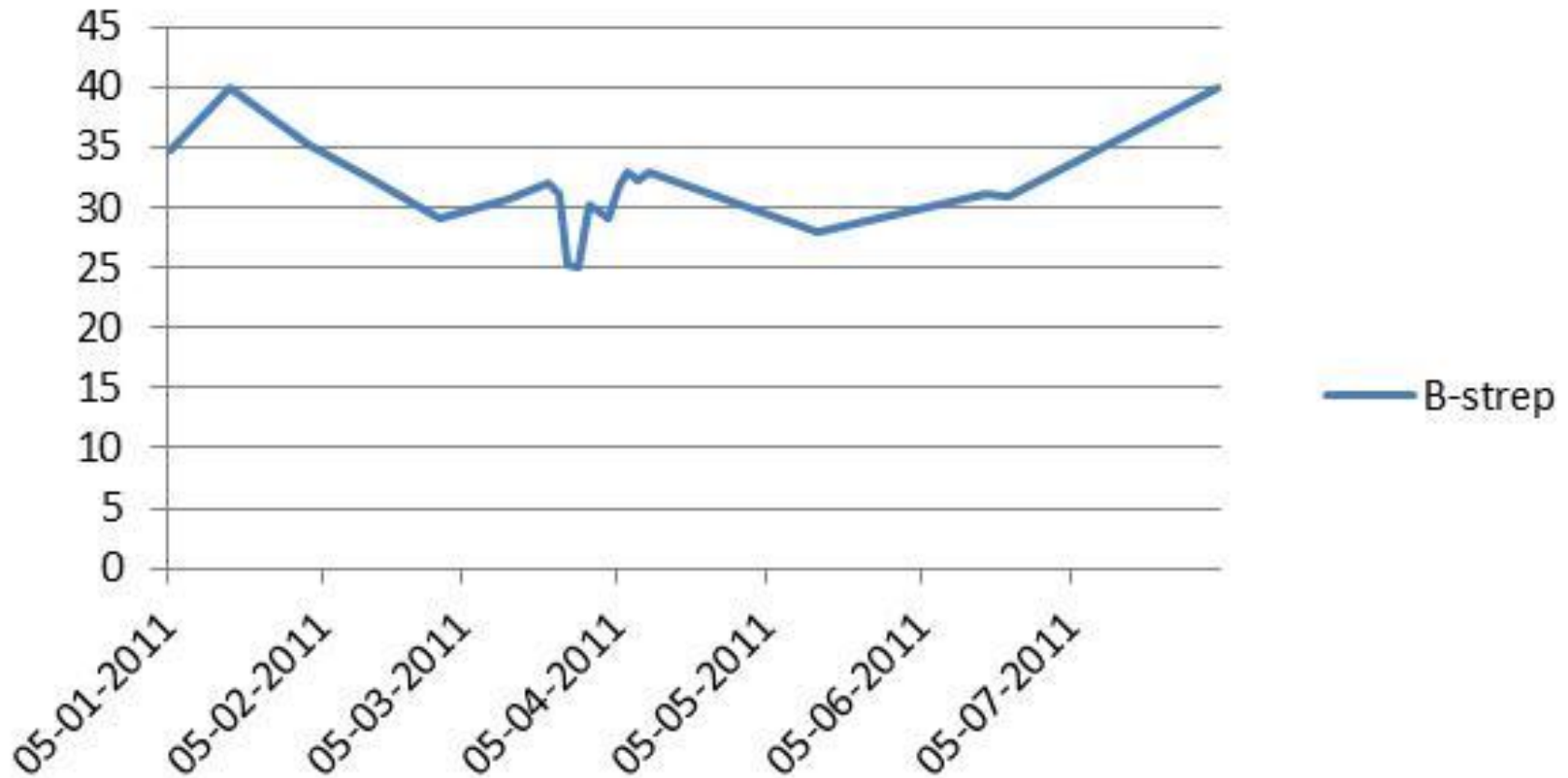
| BESNR | UDTAGDATO | Staf. aure | E.coli | Strep dysg | B-strep | Strep ube | Klebsiella | S. macesc | A. pyogen |
|-------|------------|------------|--------|------------|---------|-----------|------------|-----------|-----------|
| 21058 | 05-01-2011 | 35 | 38,2 | 32 | 34,7 | 28,8 | 40 | 40 | 39,3 |
| 21058 | 17-01-2011 | 30,2 | 32,4 | 30,2 | 40 | 32,8 | 40 | 40 | 40 |
| 21058 | 02-02-2011 | 34,4 | 40 | 32 | 35,3 | 29,3 | 40 | 40 | 40 |
| 21058 | 14-02-2011 | 33,7 | 40 | 33,6 | 32,5 | 34,4 | 40 | 40 | 38 |
| 21058 | 28-02-2011 | 28,5 | 40 | 30,1 | 29,2 | 30,2 | 40 | 40 | 40 |
| 21058 | 14-03-2011 | 31,3 | 40 | 32,3 | 30,7 | 31,3 | 40 | 40 | 40 |
| 21058 | 22-03-2011 | 30,7 | 34,4 | 30,6 | 32,1 | 31,5 | 40 | 40 | 38,4 |
| 21058 | 24-03-2011 | 32,5 | 36,4 | 33,5 | 31,2 | 32,2 | 40 | 40 | 40 |
| 21058 | 26-03-2011 | 29,8 | 33,4 | 29,2 | 25,3 | 31,9 | 40 | 40 | 37 |
| 21058 | 28-03-2011 | 30,3 | 31,4 | 29,4 | 25 | 27,1 | 40 | 40 | 40 |
| 21058 | 30-03-2011 | 31,3 | 34,9 | 31,7 | 30,2 | 31,9 | 40 | 40 | 40 |
| 21058 | 01-04-2011 | 30,9 | 34,4 | 30,1 | 29,7 | 29,9 | 40 | 40 | 35,6 |
| 21058 | 03-04-2011 | 28,7 | 39,2 | 29,8 | 29,1 | 30,9 | 40 | 40 | 36,9 |
| 21058 | 05-04-2011 | 33,4 | 27,2 | 28,9 | 31,9 | 30,6 | 40 | 40 | 40 |
| 21058 | 07-04-2011 | 33,9 | 40 | 31,5 | 33 | 34,1 | 40 | 40 | 40 |
| 21058 | 09-04-2011 | 35 | 40 | 31,7 | 32,3 | 30,7 | 40 | 40 | 38 |
| 21058 | 11-04-2011 | 32,1 | 40 | 34,1 | 33 | 33,3 | 38,9 | 40 | 38,1 |
| 21058 | 15-05-2011 | 40 | 33 | 28,6 | 28 | 29,5 | 40 | 40 | 37,1 |
| 21058 | 18-06-2011 | 31,9 | 38,8 | 32,3 | 31,1 | 30,7 | 40 | 40 | 36,4 |

Variation fra dag til dag 21058

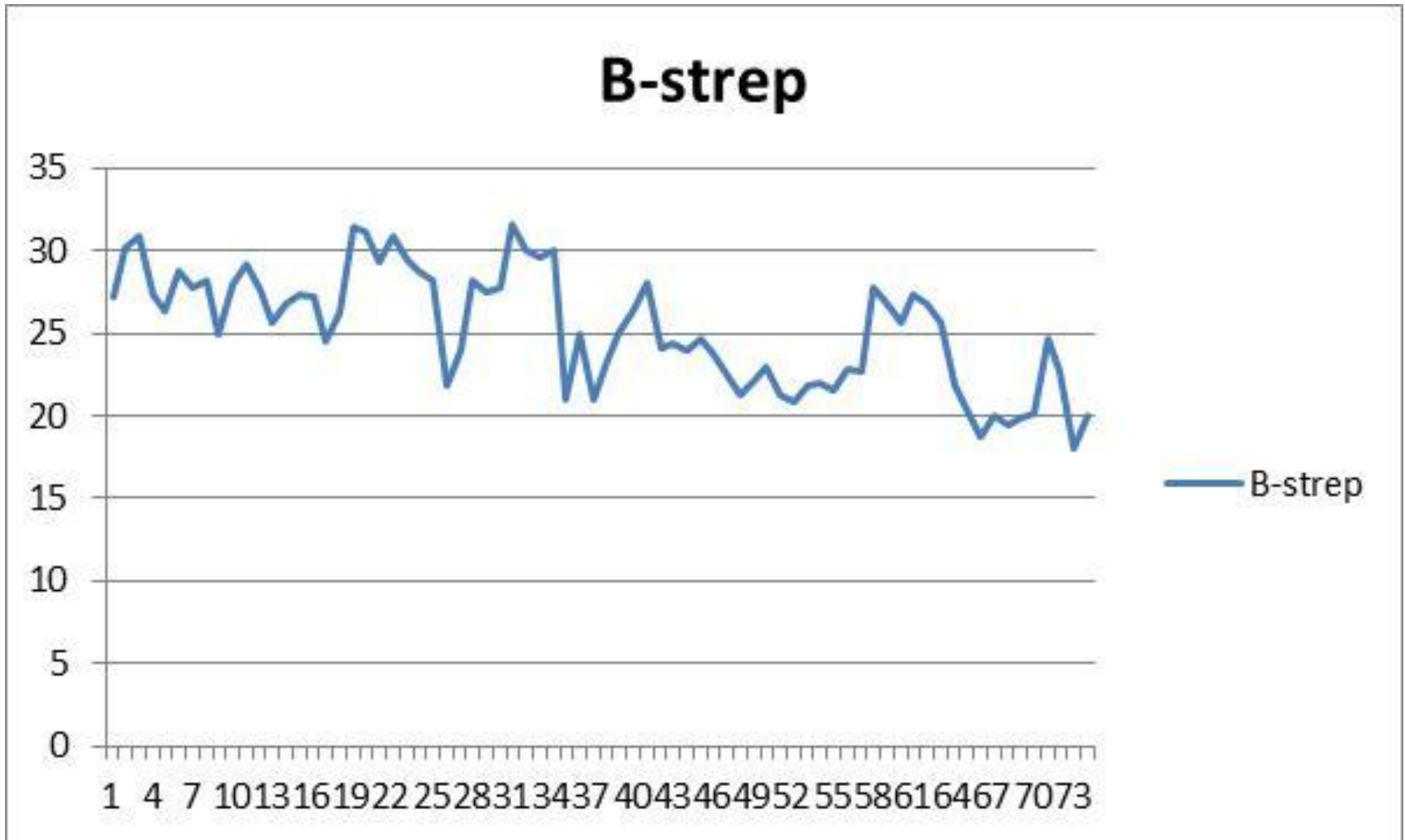


Variation fra dag til dag 21058

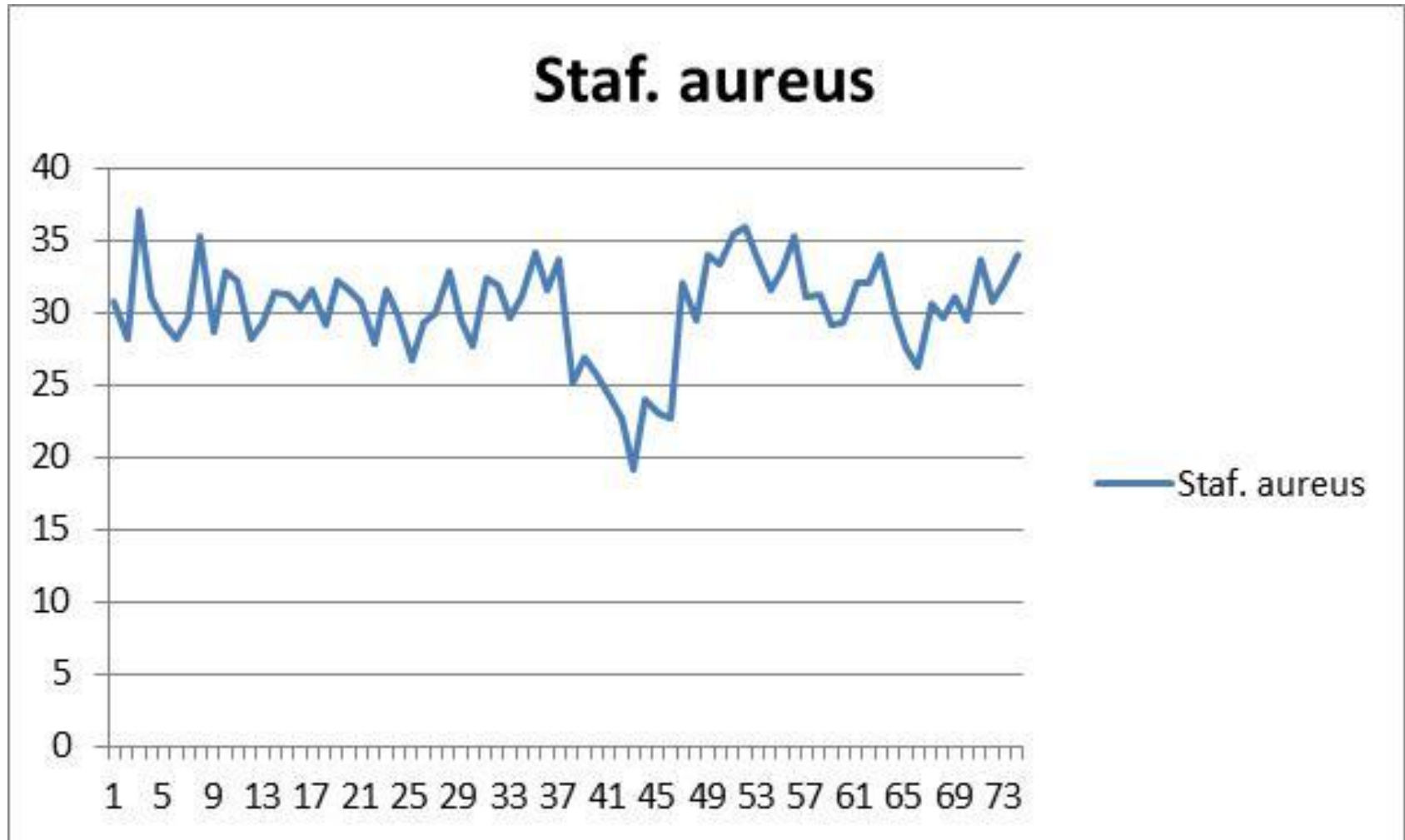
B-strep



Variation fra dag til dag 58955



Variation fra dag til dag 58955



Individual cow testing of DHI samples



7323

Give



Sundhedsstatus

Overvågning tankmælk

Tilknyttede bes.nr Staldopdeling Indlæs Udlæs Øremærkebestilling Sundhedsstatus

Prøvetype: PCR

Sygdom Overvåg enkeltdyr Overvåg tankmælk Bakt. fund Overvåg slagteblod KVR Journal ParaTB oversigt ParaTB tilmeld

| Prøvemateriale | | Udtagningsdato | Modtaget dato | Resultat | | | Status | Gyldig | Mejerinr | Leverandørnr | Art | | Ajourført | |
|----------------|-------|----------------|---------------|----------|------|-------|--------|-------------------------------------|----------|--------------|------|----------------|-----------|------------|
| Kode | Tekst | | | Prøve | Kode | Tekst | | | | | Kode | Tekst | Af bruger | Dato |
| 3 | Mælk | 28-10-2009 | 28-12-2009 | | | | OK | <input checked="" type="checkbox"/> | 1 | 21058 | 11 | Årlig Tankmælk | H6601 | 28-12-2009 |

- Ny prøve
- Ret prøve
- Slet Ctrl+D
- Fortryd række Ctrl+Z

- Klip felt Ctrl+X
- Kopier felt Ctrl+C
- Indsæt felt Ctrl+V

- Vis PCR-analysedata

Vis flere

7323

Give



Sundhedsstatus

Overvågning tankmælk

Tilknyttede bes.nr | Staldopdeling | Indlæs | Udlæs | Blemærkebest

Prøvetype: PCR

Sygdom | Overvåg enkeltdyr | Overvåg tankmælk | Bakt. fund

| Prøvemateriale | | Udtagningsdato | Modtaget dato | Prøve |
|----------------|-------|----------------|---------------|-------|
| Kode | Tekst | | | |
| 3 | Mælk | 28-10-2009 | 28-12-2009 | |

Vis flere

PCR resultater

Ejendom Udtagsdato

[Redacted] 28-10-2009

| Bakterietype / gen | Resultat | Ajourført | |
|---------------------|----------|-----------|------------|
| | | af bruger | dato |
| Staf. aureus | 33,0 | H6601 | 28-12-2009 |
| Enterococcus sp | 34,9 | H6601 | 28-12-2009 |
| C. bovis | 34,3 | H6601 | 28-12-2009 |
| Beta-lactam | 35,0 | H6601 | 28-12-2009 |
| E. coli | 40,0 | H6601 | 29-12-2009 |
| Strep dysgalactiae | 30,4 | H6601 | 28-12-2009 |
| Staph sp | 28,7 | H6601 | 28-12-2009 |
| Strep uberis | 29,0 | H6601 | 28-12-2009 |
| Klebsiella sp | 40,0 | H6601 | 29-12-2009 |
| S. macescens | 40,0 | H6601 | 29-12-2009 |
| A. pyogenes+P. ind. | 40,0 | H6601 | 29-12-2009 |
| B-strep | 40,0 | H6601 | 29-12-2009 |

Luk

| Art | Ajourført | |
|----------------|-----------|------------|
| | Af bruger | Dato |
| Årlig Tankmælk | H6601 | 28-12-2009 |

Vejleder X

Ejendom W

Besætning Q

Ejendom

Udtagsdato

| Bakterietype / gen | Resultat | Ajourført | |
|---------------------|----------|-----------|------------|
| | | af bruger | dato |
| Staf. aureus | 30,6 | H6601 | 28-12-2009 |
| Enterococcus sp | 30,4 | H6601 | 28-12-2009 |
| C. bovis | 33,2 | H6601 | 28-12-2009 |
| Beta-lactam | 34,5 | H6601 | 28-12-2009 |
| E.coli | 33,2 | H6601 | 28-12-2009 |
| Strep dysgalactiae | 29,3 | H6601 | 28-12-2009 |
| Staph sp | 29,1 | H6601 | 28-12-2009 |
| B-strep | 40,0 | H6601 | 29-12-2009 |
| Strep uberis | 31,9 | H6601 | 28-12-2009 |
| Klebsiella sp | 40,0 | H6601 | 29-12-2009 |
| S. marcescens | 40,0 | H6601 | 29-12-2009 |
| A. pyogenes+P. ind. | 33,1 | H6601 | 28-12-2009 |

| Dansk Kvæg | Malkekvæg | PCR - Besætningsudskrift |
|------------|-----------------------------------|--|
| | Bes-nr Kontrol dato 22.01.10 4 | Udskrevet 08.02.10 15.32 Side 1 Jørgen Katholm 87 31 20 00 9985 |

Tankmælksundersøgelser

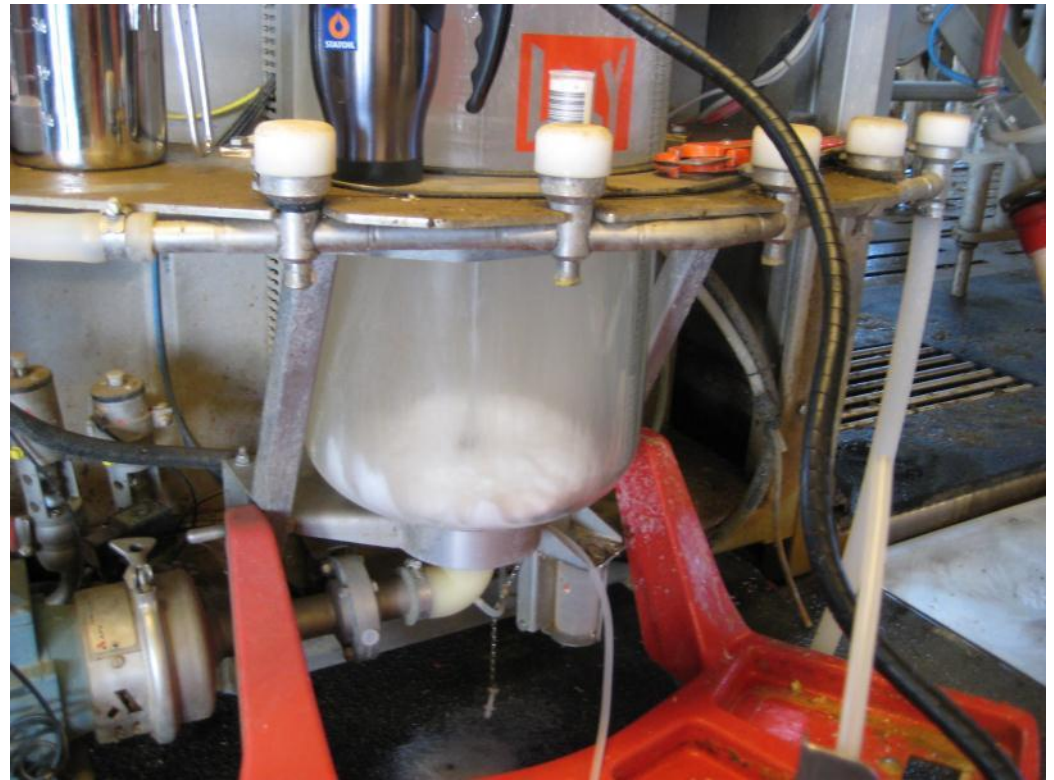
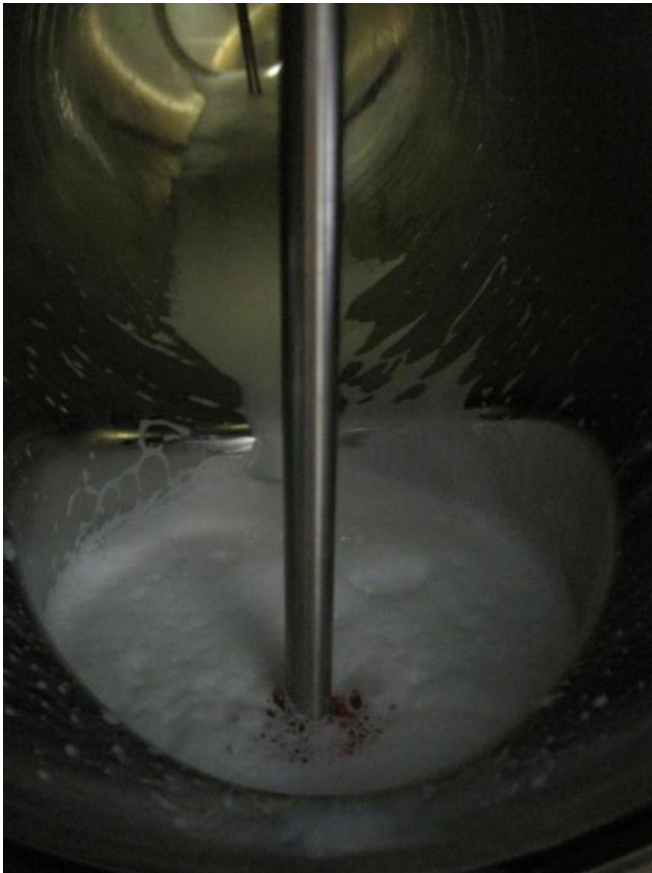
| Dato | Staf a | Staf sp | Lac-tam | B-str | Str d | Str u | Ent | C. Bovis | E. Coli | Kle | S. Mac | A. pyo |
|------------|--------|---------|---------|-------|-------|-------|-----|----------|---------|-----|--------|--------|
| 20.01.2010 | 34,5 | 33,2 | 35,8 | 40 | 40 | 31,7 | 40 | 32 | 39,9 | 40 | 40 | 39,6 |

Enkeltdyrundersøgelser

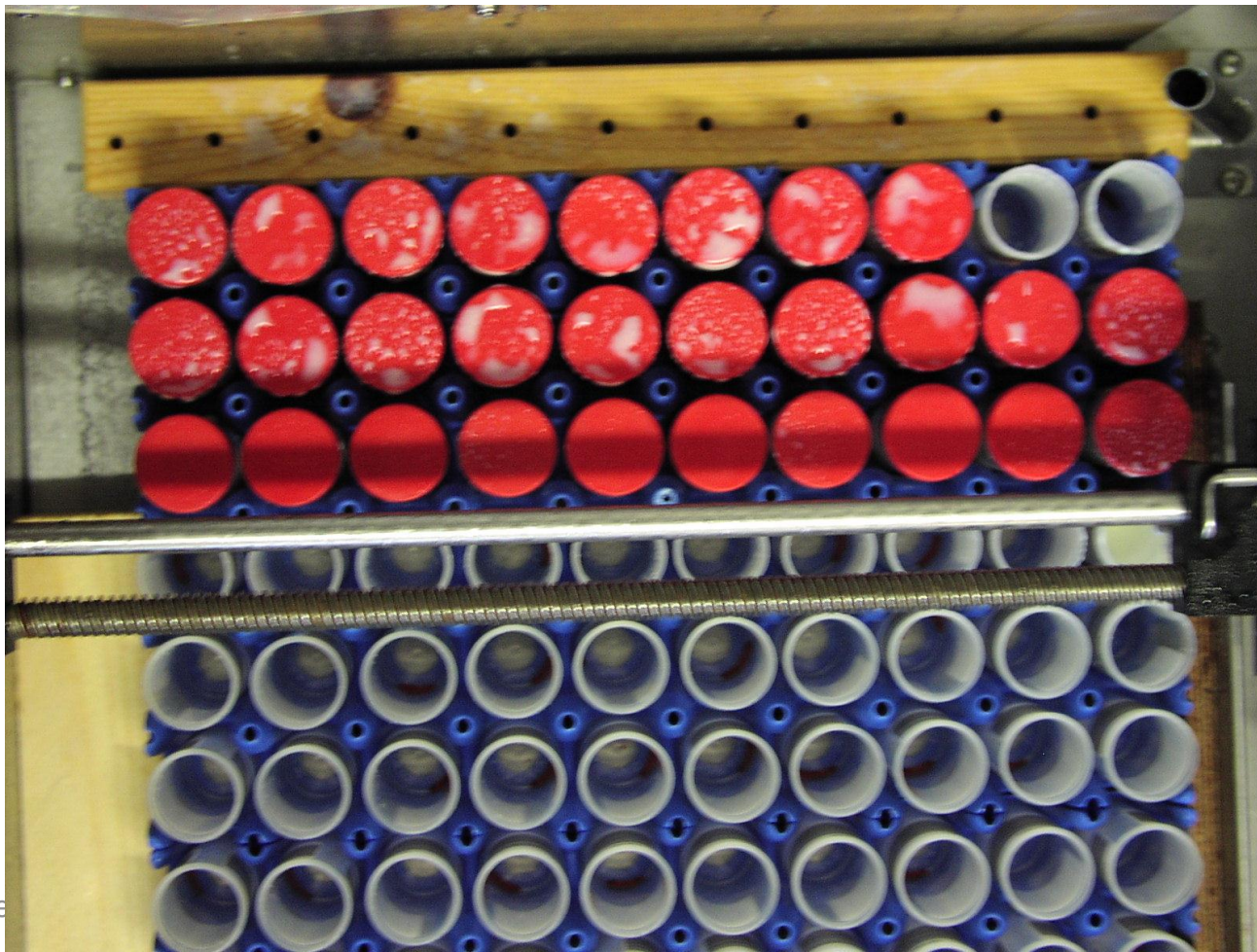
| CKRdyrn Dato | DEK | Staf a | Staf sp | Lac-tam | B-str | Str d | Str u | Ent | C. Bovis | E. Coli | Kle | S. Mac | A. pyo |
|-----------------|-----|--------|---------|---------|-------|-------|-------|------|----------|---------|-----|--------|--------|
| -00023 2010 | 191 | 40 | 29,3 | 34,6 | 37,4 | 36,3 | 34,6 | 40 | 40 | 40 | 40 | 40 | 37,5 |
| -00337 2010 | 415 | 40 | 24,8 | 26,2 | 40 | 40 | 40 | 40 | 26,1 | 40 | 40 | 40 | 40 |
| -00549 2010 | 479 | 40 | 29,9 | 37,3 | 33,6 | 40 | 40 | 40 | 32,3 | 40 | 40 | 40 | 40 |
| -00790 2010 | 194 | 40 | 27,4 | 30,1 | 40 | 40 | 39,4 | 40 | 27,7 | 40 | 40 | 40 | 40 |
| -00830 2010 | 51 | 40 | 27,6 | 32,9 | 40 | 40 | 40 | 40 | 28,5 | 37,9 | 40 | 40 | 35 |
| -01003 2010 | 374 | 40 | 37,4 | 40 | 40 | 40 | 40 | 40 | 28,4 | 40 | 40 | 40 | 40 |
| -01031 2010 | 298 | 27,2 | 24,9 | 31,7 | 40 | 40 | 40 | 40 | 32,7 | 39,7 | 40 | 40 | 40 |
| -01075 2010 | 176 | 27,2 | 24,7 | 26,6 | 40 | 40 | 38,9 | 40 | 30,2 | 40 | 40 | 40 | 40 |
| -01077 2009 | 200 | 40 | 40 | 40 | 40 | 40 | 15,9 | 40 | 40 | 33,1 | 40 | 40 | 40 |
| -01092 | 642 | 29,1 | 22,4 | 24,7 | 22,8 | 40 | 40 | 28,6 | 23,5 | 40 | 40 | 40 | 36 |

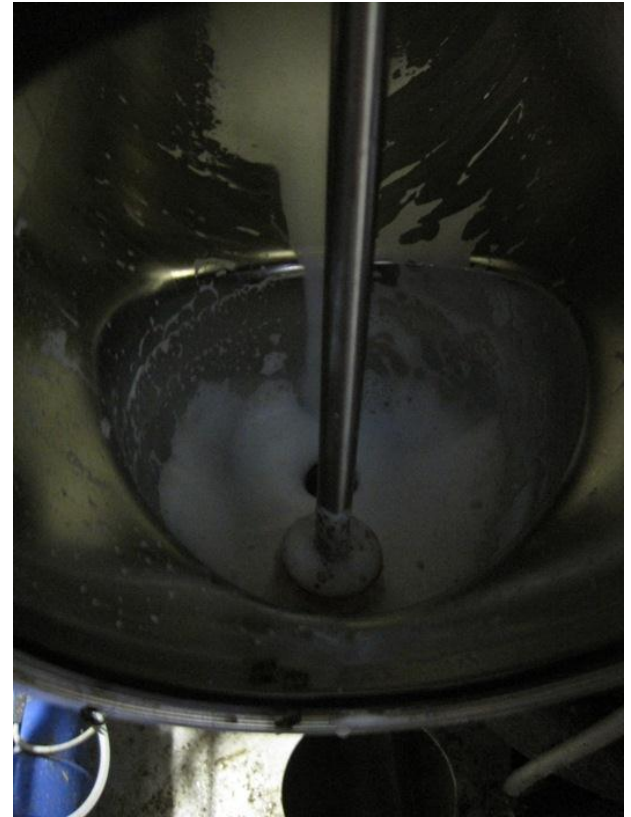


Focus area reduction of carry over



Carry over is a serious problem





Årlig tankmælks prøve alle leverandører

Årlig siden 1995. Fra 1963-1995 forskellige intervaller

Stregkodekort til start af indvejning af mælk

Prøve ventil i tankvogn

VM OVP ventil, firma VM Tarm A/S

Første 30-40 l, ingen prøve

Derefter 1.5 ml 40 gange i interval

Afhængigt af besætningens sidste mælke
leverance

Total prøve 60 ml

Rensning af ventil med tryk luft

Merkat fra besætningen med stregkode

Opbevaring på is indtil test



Fedt, protein, urea og
frysepunkt
MilkoScan FT 6000



Celletal
Fosomatic 5000

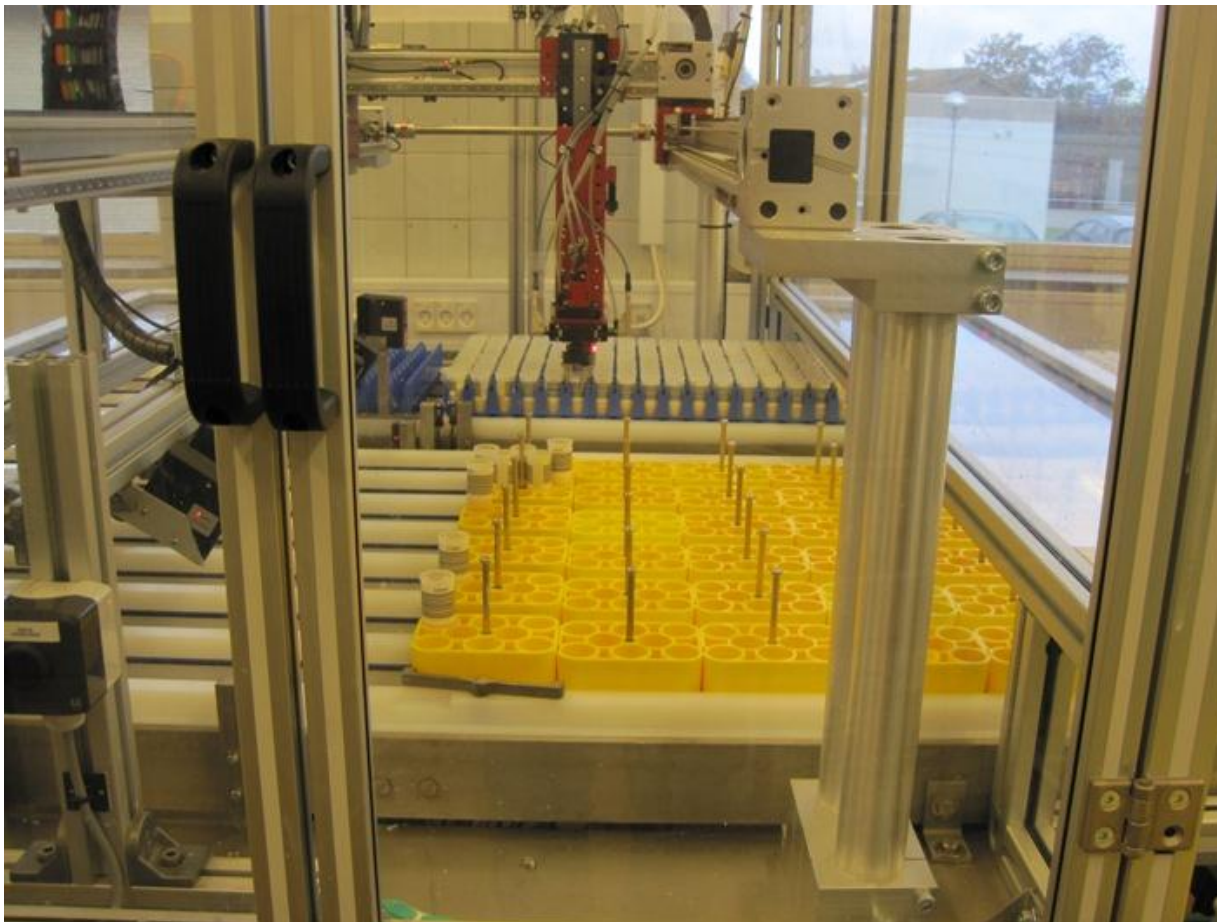








DHI – Samples – Veterinary analyses pick and place - Robot



Comparison of PCR and culture

4258 Bulk tank samples

| Test for B-strep | PCR | |
|------------------|------------------|------------------|
| | Culture Positive | Culture Negative |
| Positive | 177 (12) | 20* |
| Negative | 133 **(35) | 3928 |

Numbers in parafrase is herds betwen 37 og 39,9

*** 11 herds in B-register 9 only one positive**

**** 28 herds in B-register**

Distribution of bacteria in 4258 bulk tank samples from all Danish dairy herds in 2009

Percent herds with NoCt, median, mean and standard deviation of herds with a Ct value

| Bakteria | % NoCt | Median | Mean rest | ± sd |
|--------------------|--------|--------|-----------|------|
| Staf aureus | 9 | 32,4 | 32,5 | 2,91 |
| Staf spp | 0 | 29,8 | 29,8 | 2,07 |
| Beta-lactam | 22 | 34,8 | 34,8 | 2,65 |
| Str. agalactia (B) | 93 | 31,5 | 31,5 | 4,80 |
| Str. dys | 14 | 31,6 | 31,6 | 3,18 |
| Str. uberis | 5 | 30,3 | 30,3 | 3,44 |
| C. bovis | 10 | 33,5 | 33,7 | 1,67 |
| Enterococcus | 22 | 33,7 | 33,6 | 2,84 |
| E. coli | 39 | 35,8 | 35,2 | 3,54 |
| Klebsiella | 87 | 36,5 | 35,8 | 3,54 |
| S. macescens | 98 | 37,8 | 37,0 | 2,96 |
| A.pyo/P. ind | 37 | 35,7 | 35,2 | 2,95 |

Distribution of bacteria in 4258 bulk tank samples from all Danish dairy herds in 2009

lowest Ct value, median and fractil

| Bakteria | Lowest | Median | Fraktil 10 | Fraktil 25 | Fraktil 75 | Fraktil 90 |
|--------------------|--------|--------|------------|------------|------------|------------|
| Staf aureus | 19,5 | 32,4 | 28,9 | 30,5 | 34,4 | 36,3 |
| Staf spp | 17,7 | 29,8 | 27,3 | 28,6 | 31,0 | 32,1 |
| Beta-lactam | 22,2 | 34,8 | 31,5 | 33,1 | 36,6 | 38,4 |
| Str. agalactia (B) | 17,3 | 31,5 | 25,7 | 28,5 | 35,1 | 37,9 |
| Str. dys | 15,9 | 31,6 | 27,7 | 29,6 | 33,6 | 35,6 |
| Str. uberis | 13,9 | 30,3 | 26,0 | 28,1 | 32,4 | 34,5 |
| C. bovis | 24,5 | 33,5 | 31,9 | 32,6 | 34,5 | 35,8 |
| Enterococcus | 20,8 | 33,7 | 30,0 | 31,9 | 35,6 | 37,3 |
| E. coli | 17,6 | 35,8 | 30,4 | 33,2 | 38,1 | 39,2 |
| Klebsiella | 18,9 | 36,5 | 31,3 | 33,7 | 38,6 | 39,6 |
| S. macescens | 25,4 | 37,8 | 33,8 | 36,4 | 38,9 | 39,4 |
| A.pyo/P. ind | 18,5 | 35,7 | 31,8 | 33,9 | 37,2 | 38,5 |

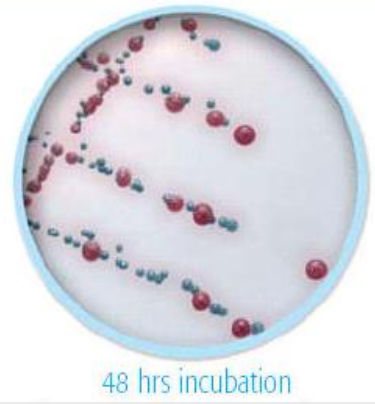
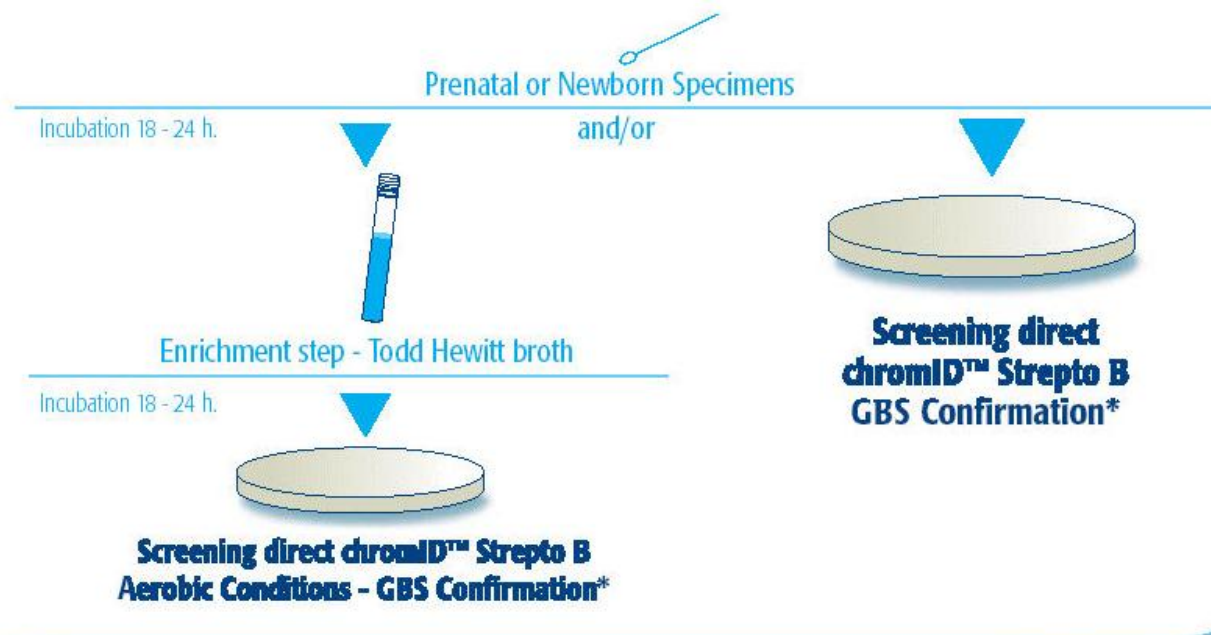
Culture on composite samples and PCR on yield control samples

3 herds 442 samples

| Test for B-strep. | PCR | |
|-------------------|----------|----------|
| | Positive | Negative |
| Culture | | |
| Positive | 38 | 8* |
| Negative | 93 | 303 |

Herd (1) 2513 (3 –NoCt) and 2710 (8 – NoCt)

Herd (3) 2322 (2-NoCt), 2316 (20-39,67), 2341 (645-NoCt), 2249 (2-37,45), 2285 (5 – NoCt),
2478 (32 – 37.11)



Test at the same milksample - 99 samples

PCR

Eurofins

Culture

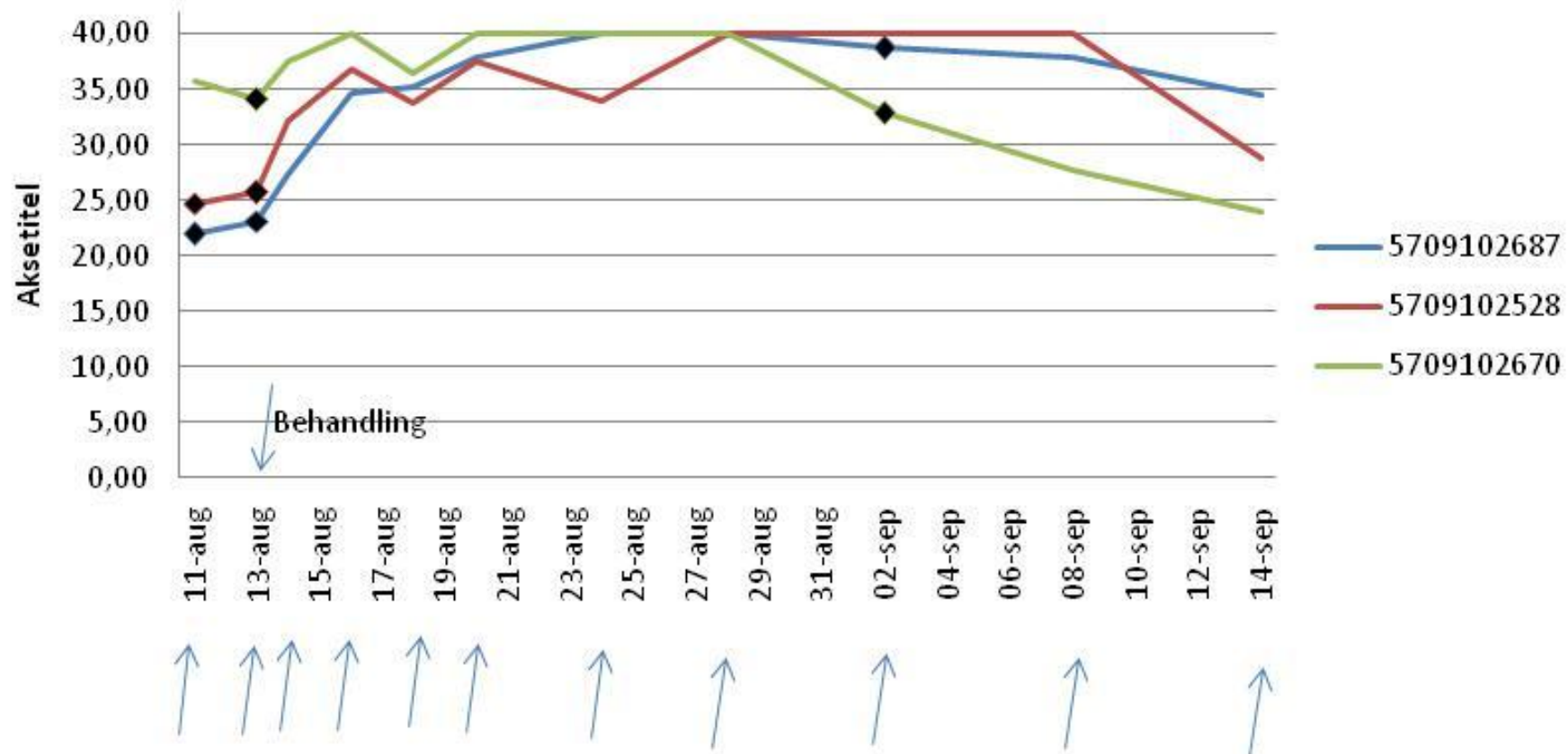
Selektiv agar Foulum

Pos 27 (10)

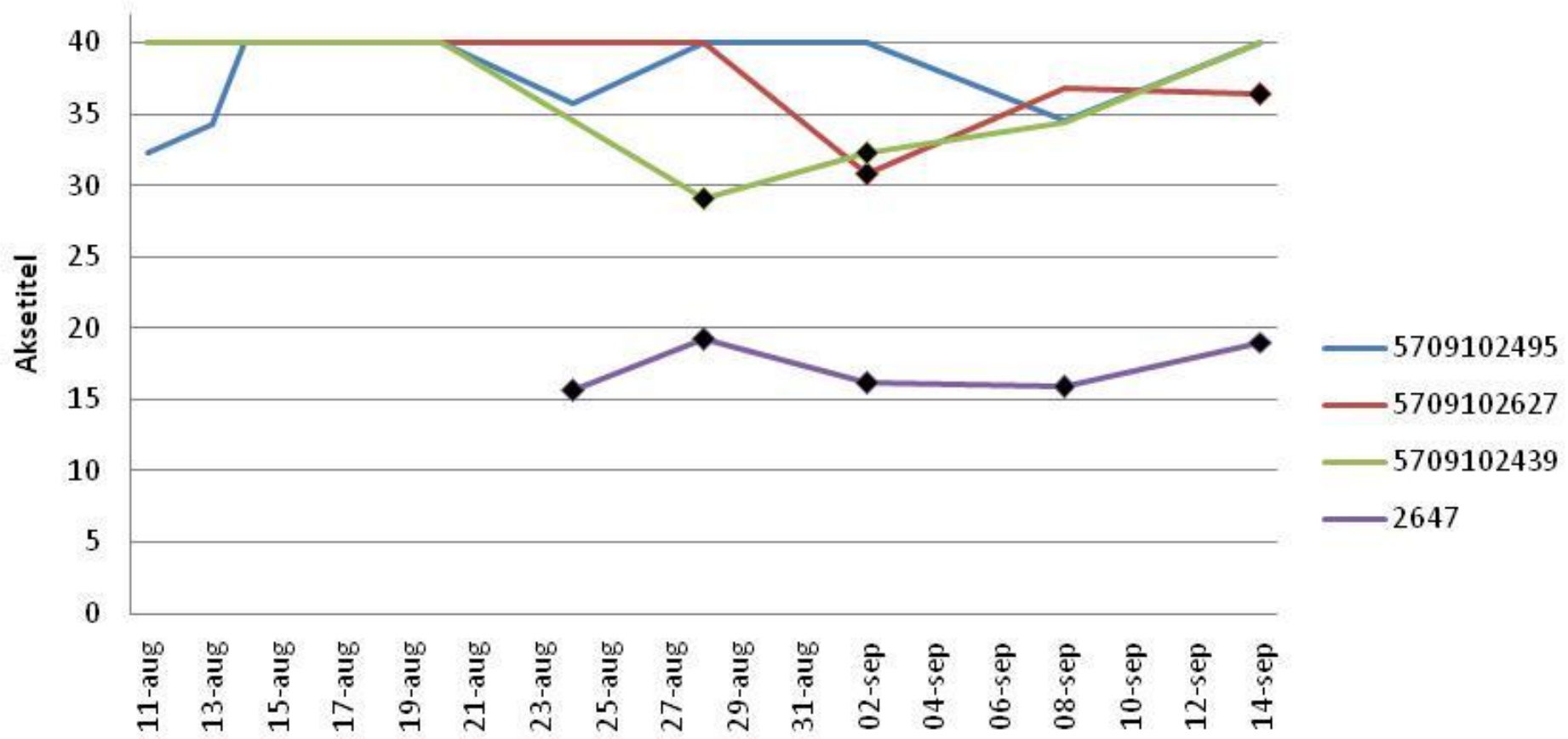
10

3

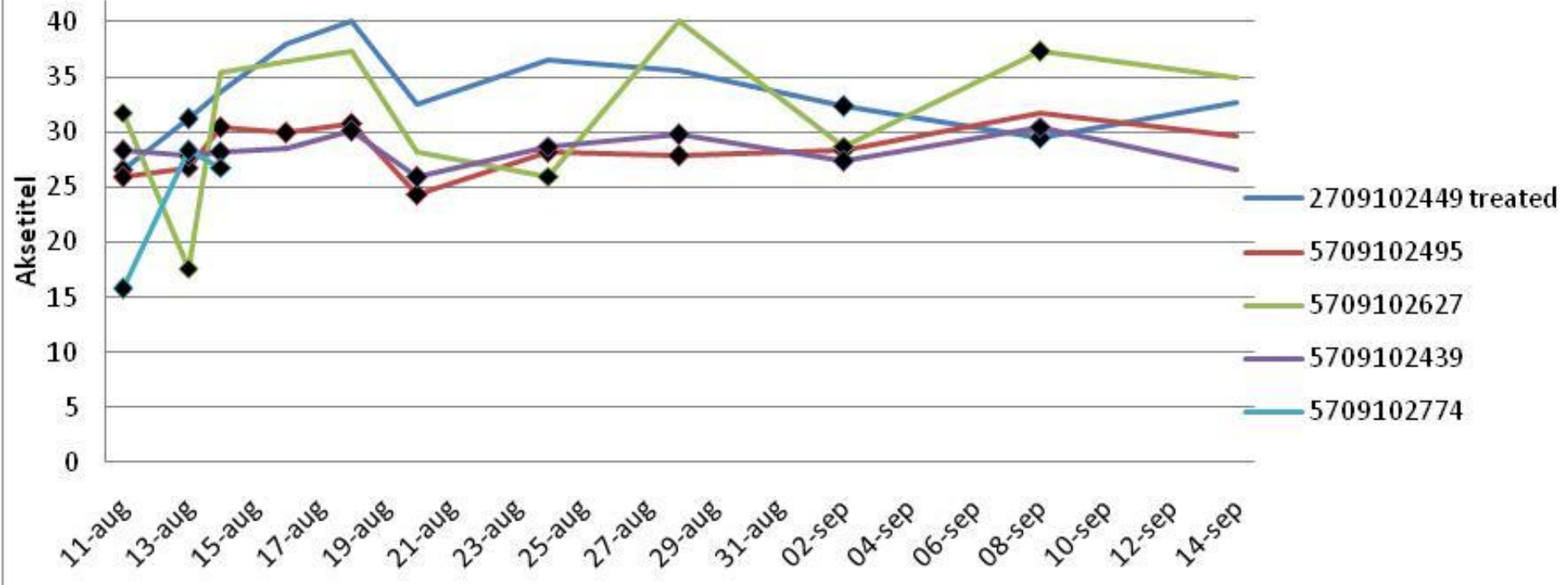
S. agalactiae PCR and culture after treatment



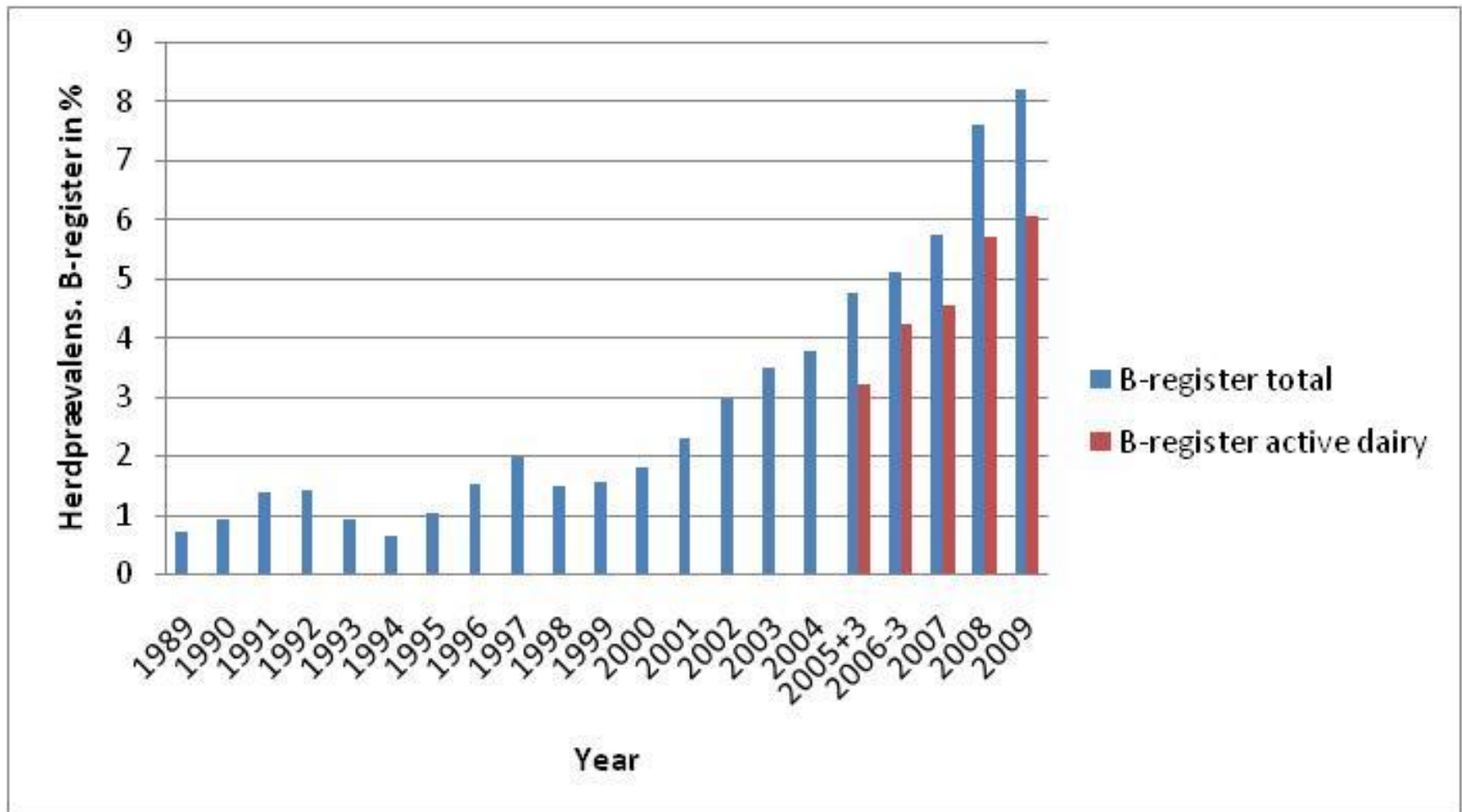
S. agalactiae PCR and culture untreated cows



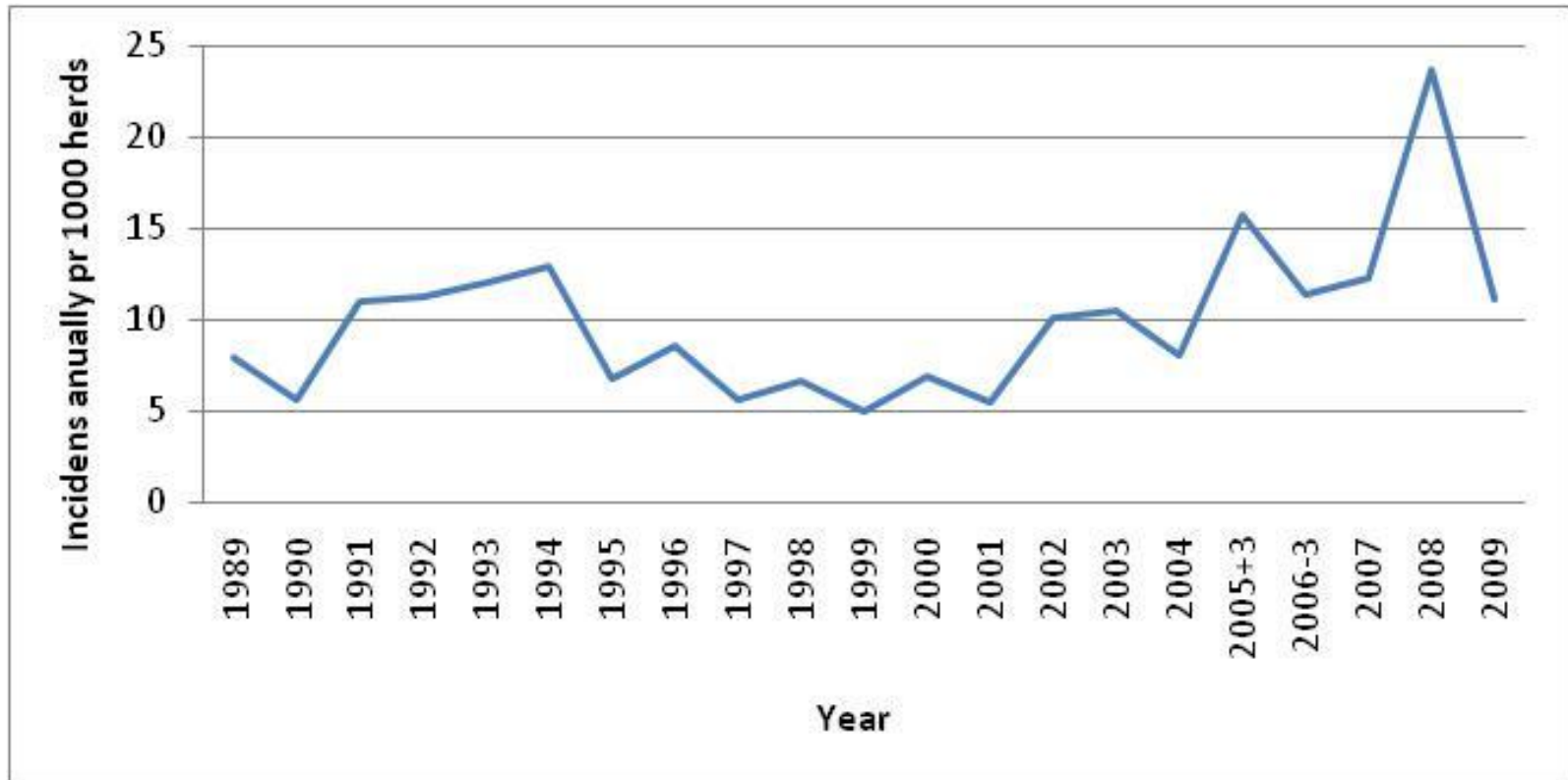
Staf. aureus PCR and culture treated and untreat cows



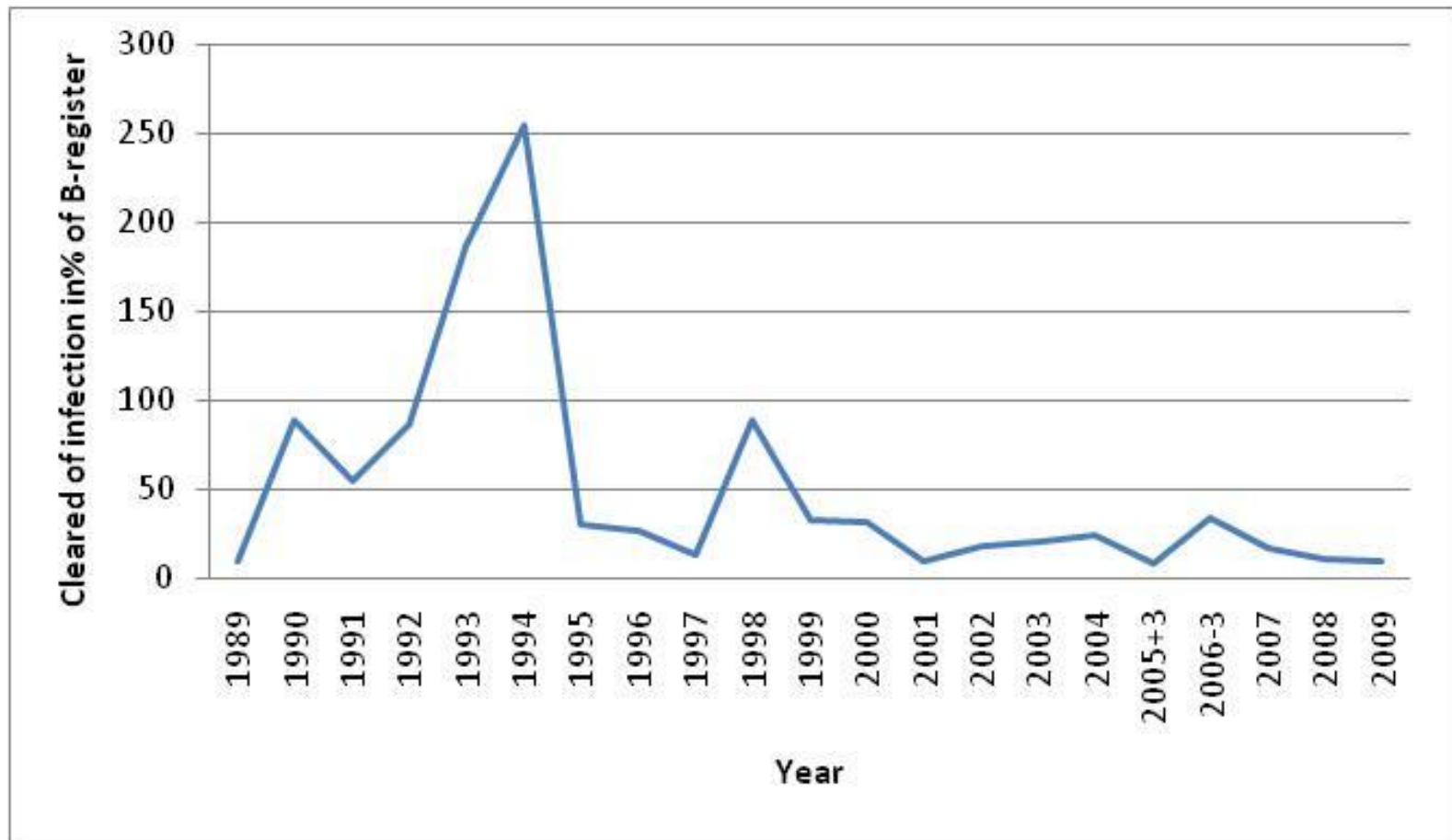
Prevalence in percent of herds in the B-register as of 31. December (1989-2009)



Incidence of Danish dairy herds in the B-register per year per 1,000 herds



Cleared herds per year in percentage of the number of herds in the B-register as of 31 December

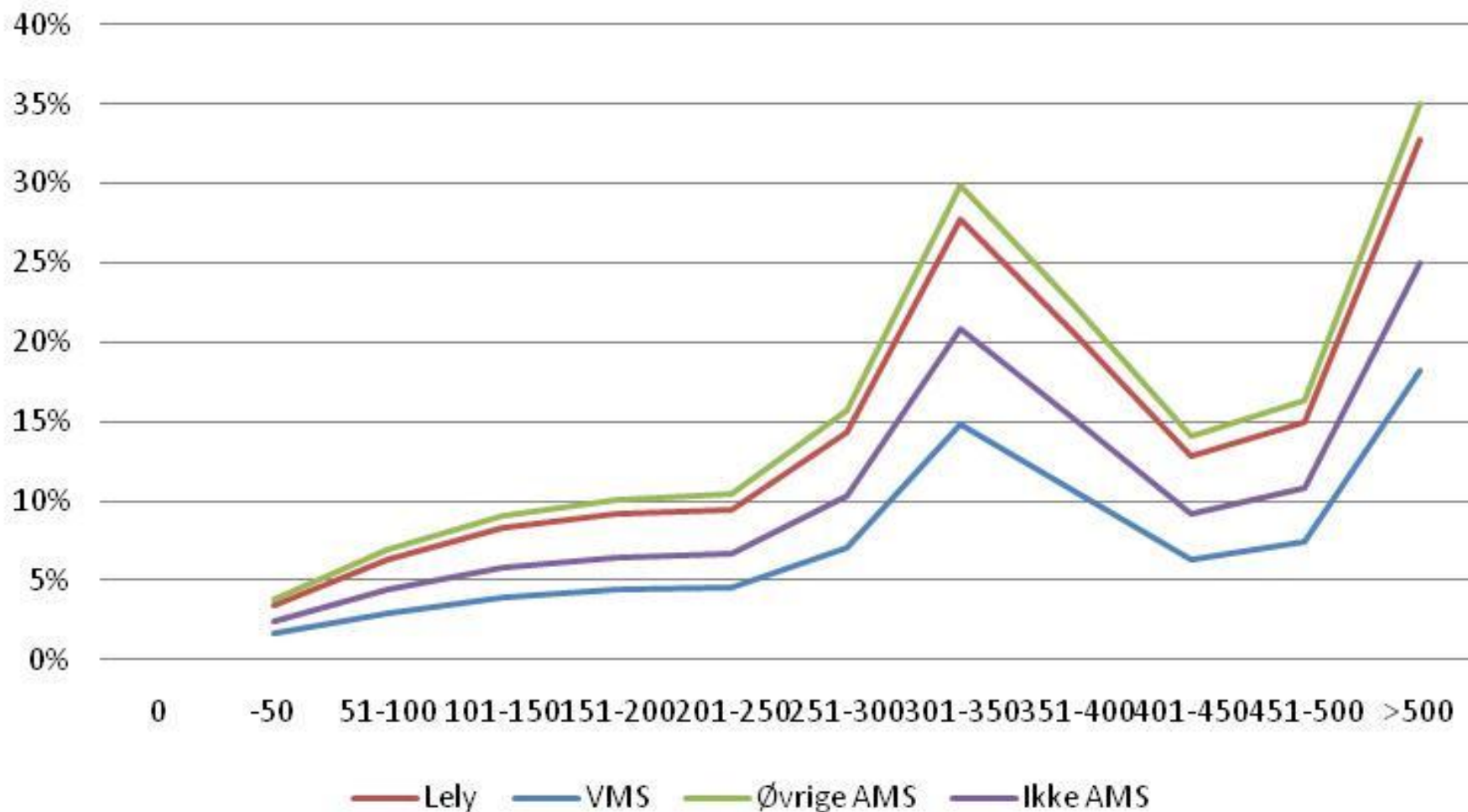


Procent besætninger i B registeret opdelt efter malkesystem og AMS fabrikat

| Herd type | Number of herds | % herds in B register |
|--------------|-----------------|-----------------------|
| Lely | 401 | 10.2% |
| DeLaval | 392 | 4.6% |
| Other AMS | 67 | 9.0% |
| Konventional | 3391 | 5.7% |
| Total | 4251 | 6.1% |

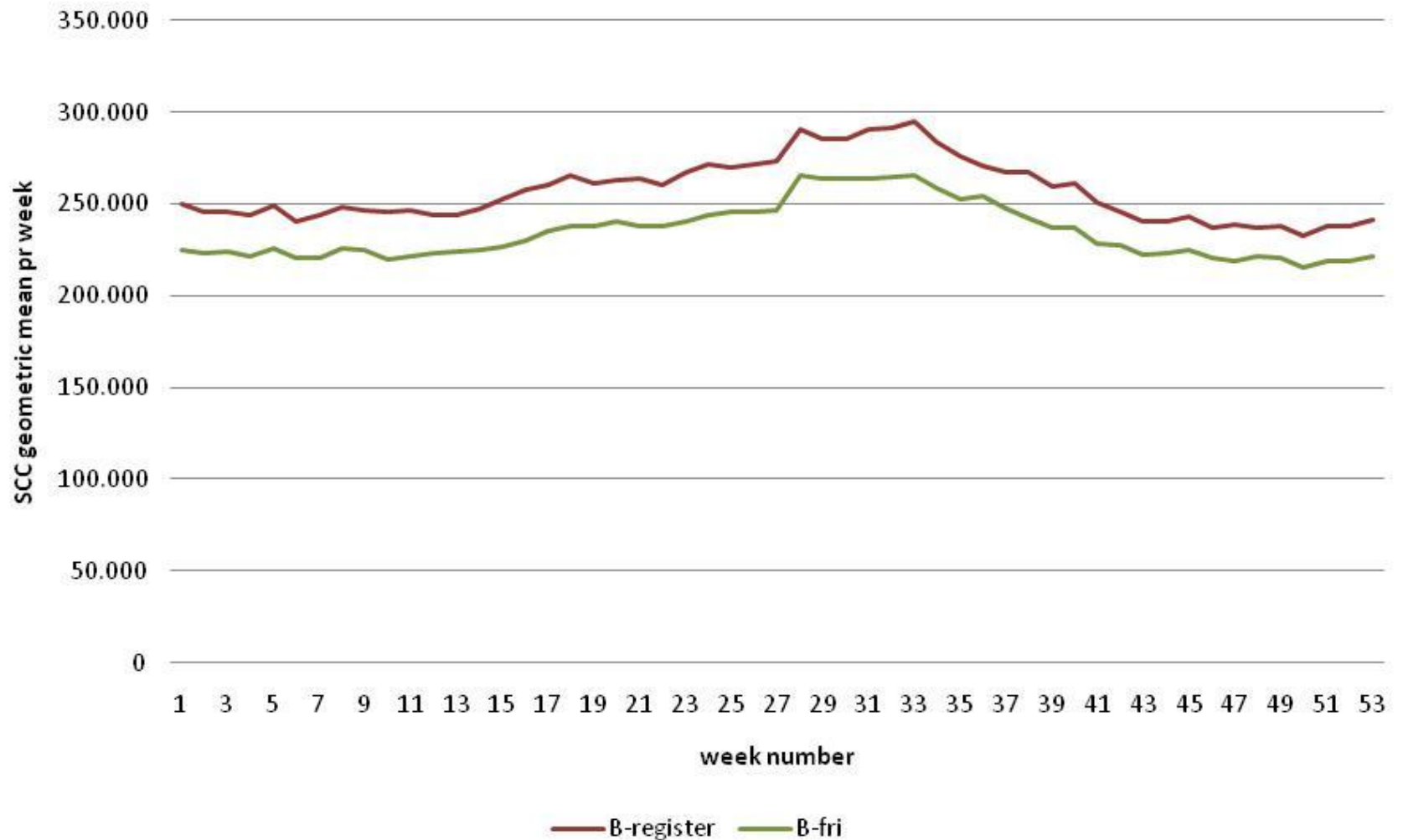
Data on the 21 december 2009

Estimated possibility for beeing in B - register - related to number of cows and AMS producer



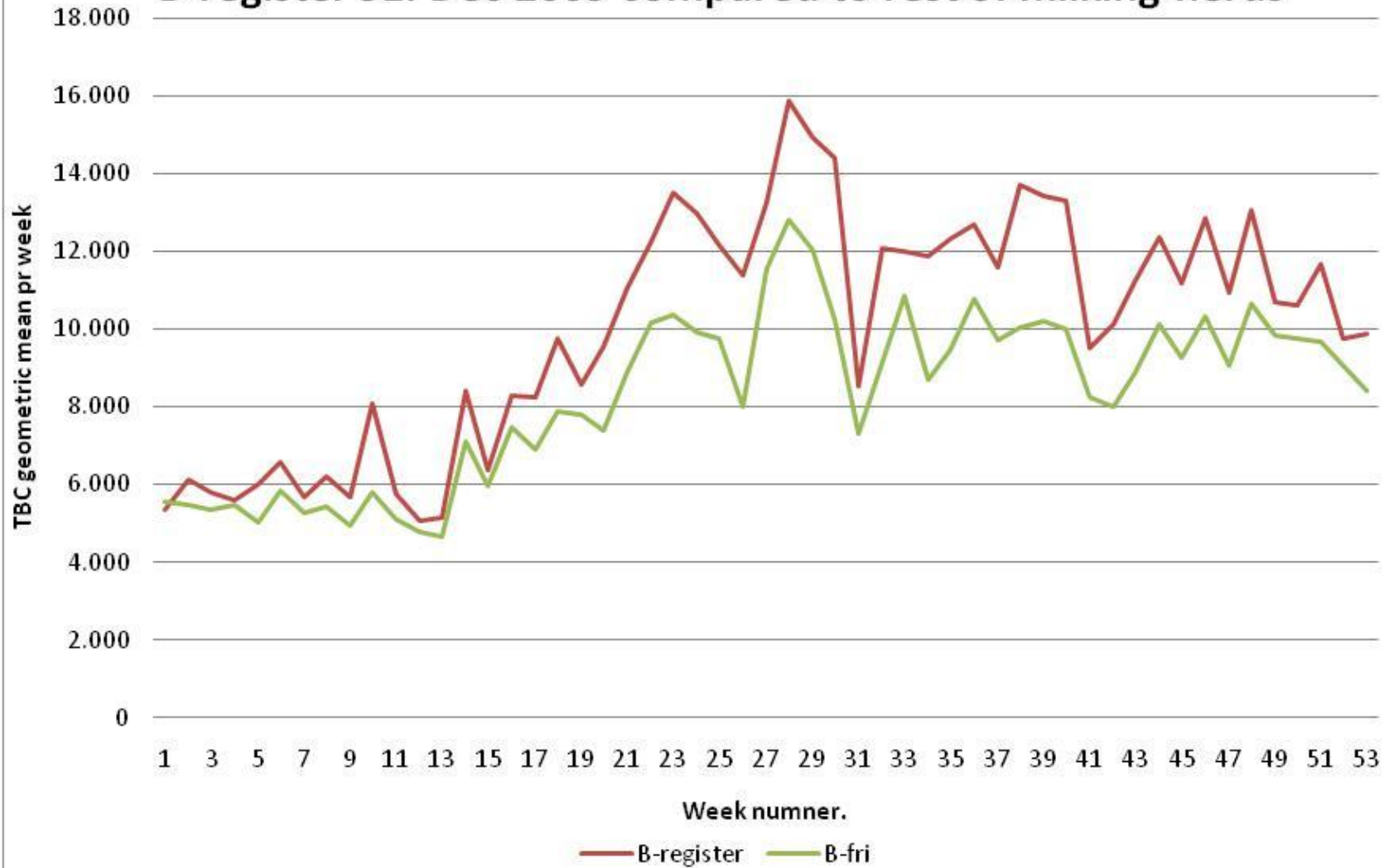
Number of cows and producer of AMS is taken into account in this logistic regression with the two factors in an additive model

SCC geometric mean each week for 261 milking herds in B-register 31. Dec 2009 compared to rest of milking herds



Based on 1 – 7 observations pr herd pr. week

TBC geometric mean each week for 261 milking herds in B-register 31. Dec 2009 compared to rest of milking herds



Based on 1 - 2 observations pr herd pr. 2 weeks

Ability of bulk milk culture for estimating *Streptococcus agalactiae* prevalence in Danish dairy herds

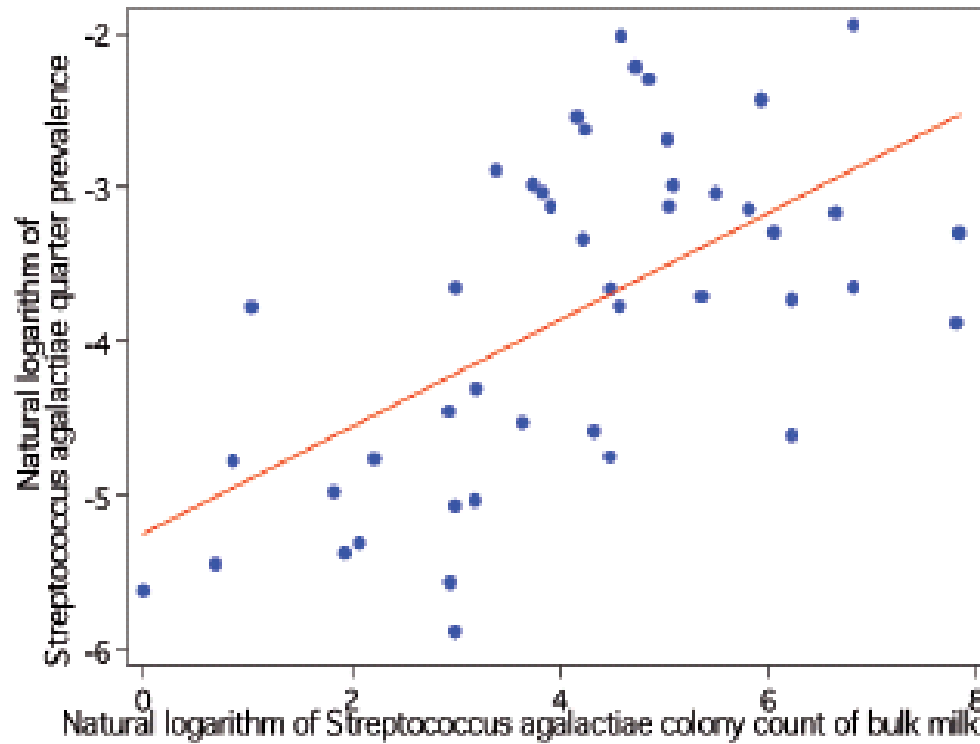
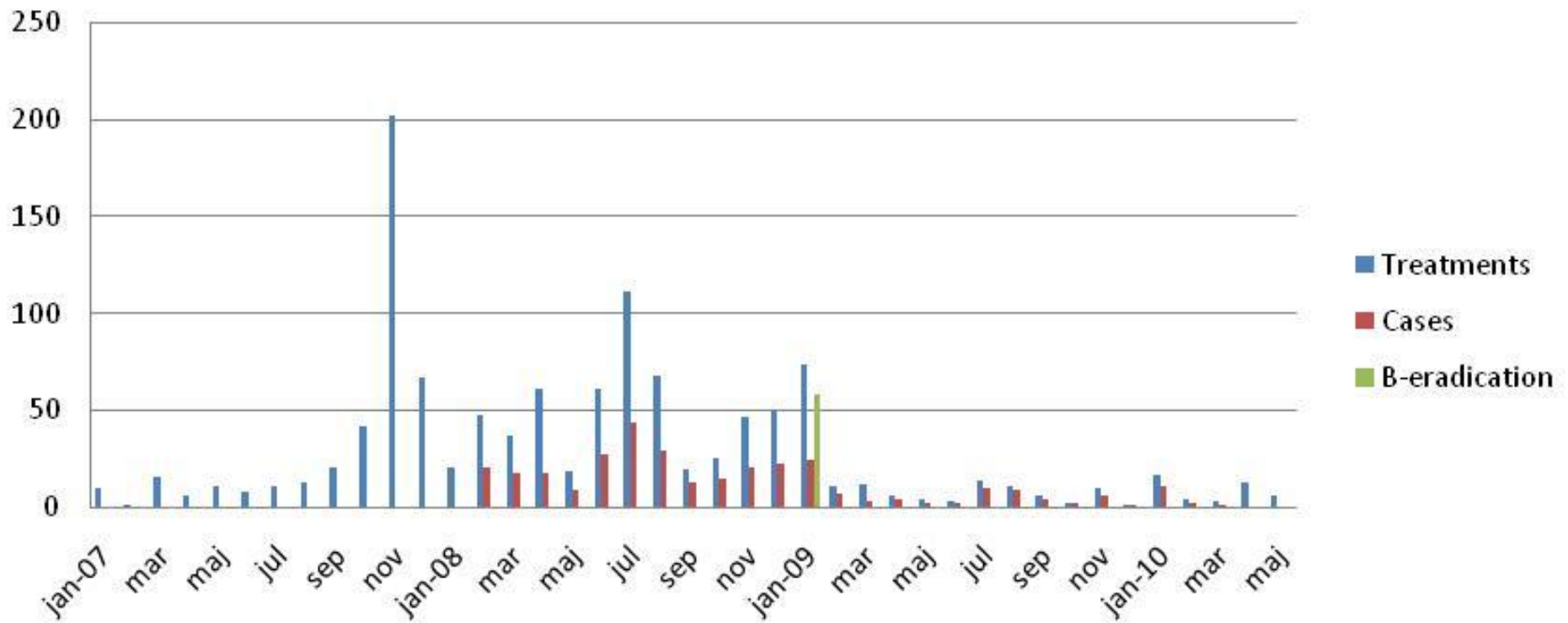


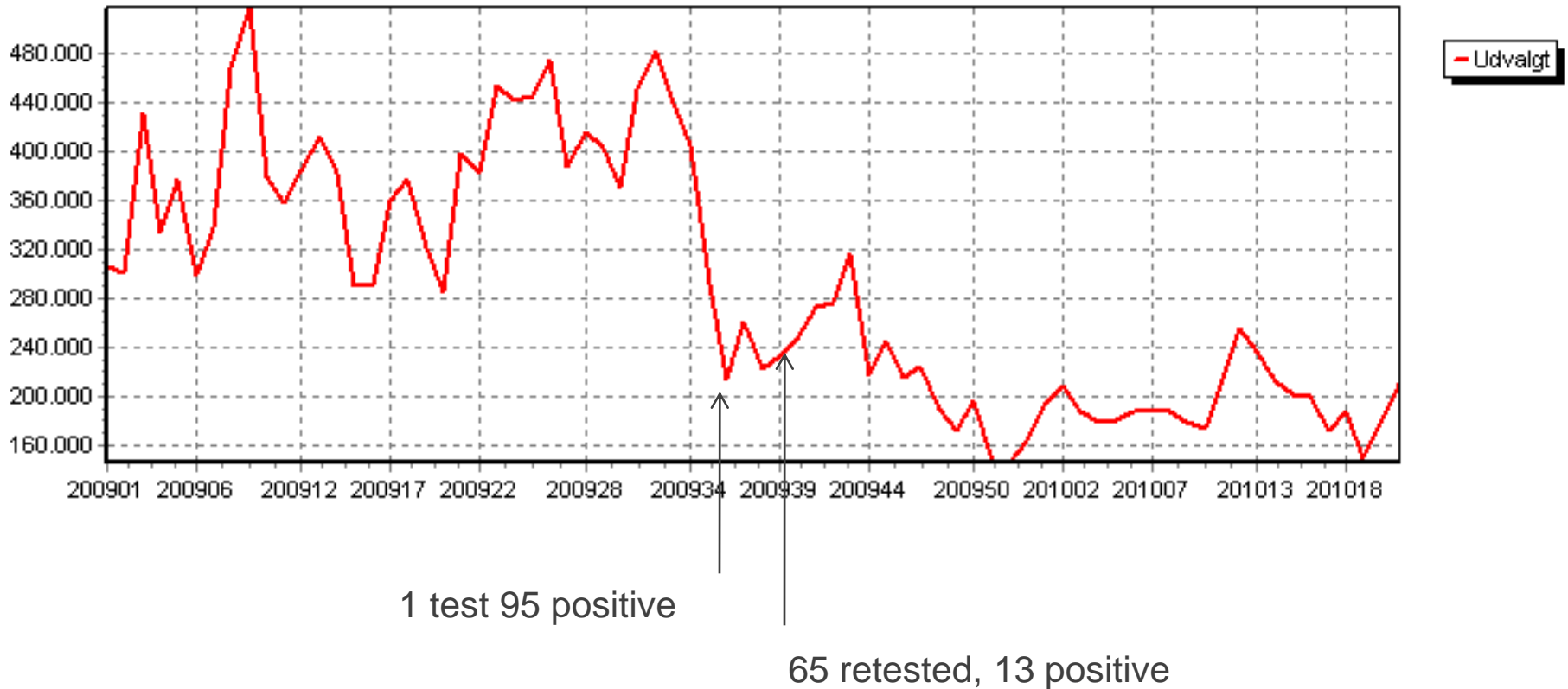
Figure 2. *Streptococcus agalactiae* quarter prevalence against colony count in bulk milk.

Mastitis, cases and treatments herd 1. Segregation 19 jan 2009



Infected beginning of 2009 after expansion
After around 6 months prevalence 34% (I/S T)

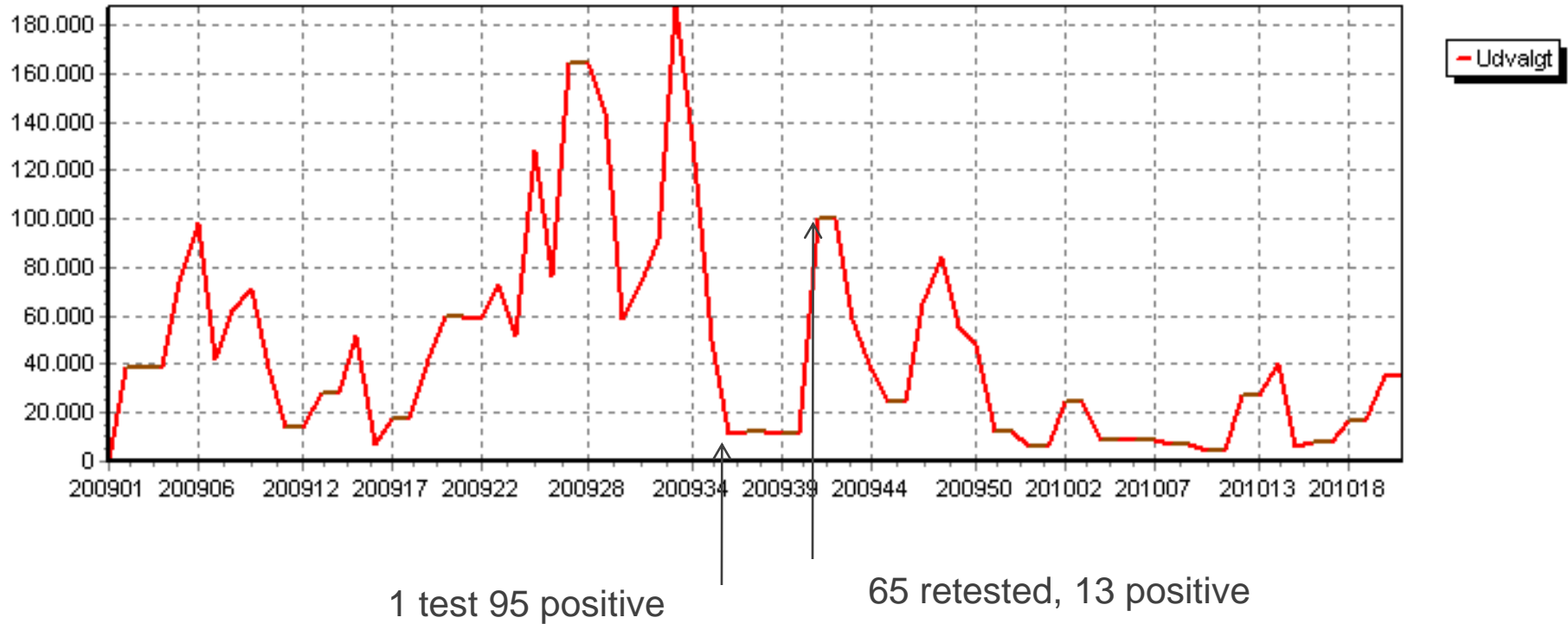
SCC



Infected beginning of 2009 after expansion

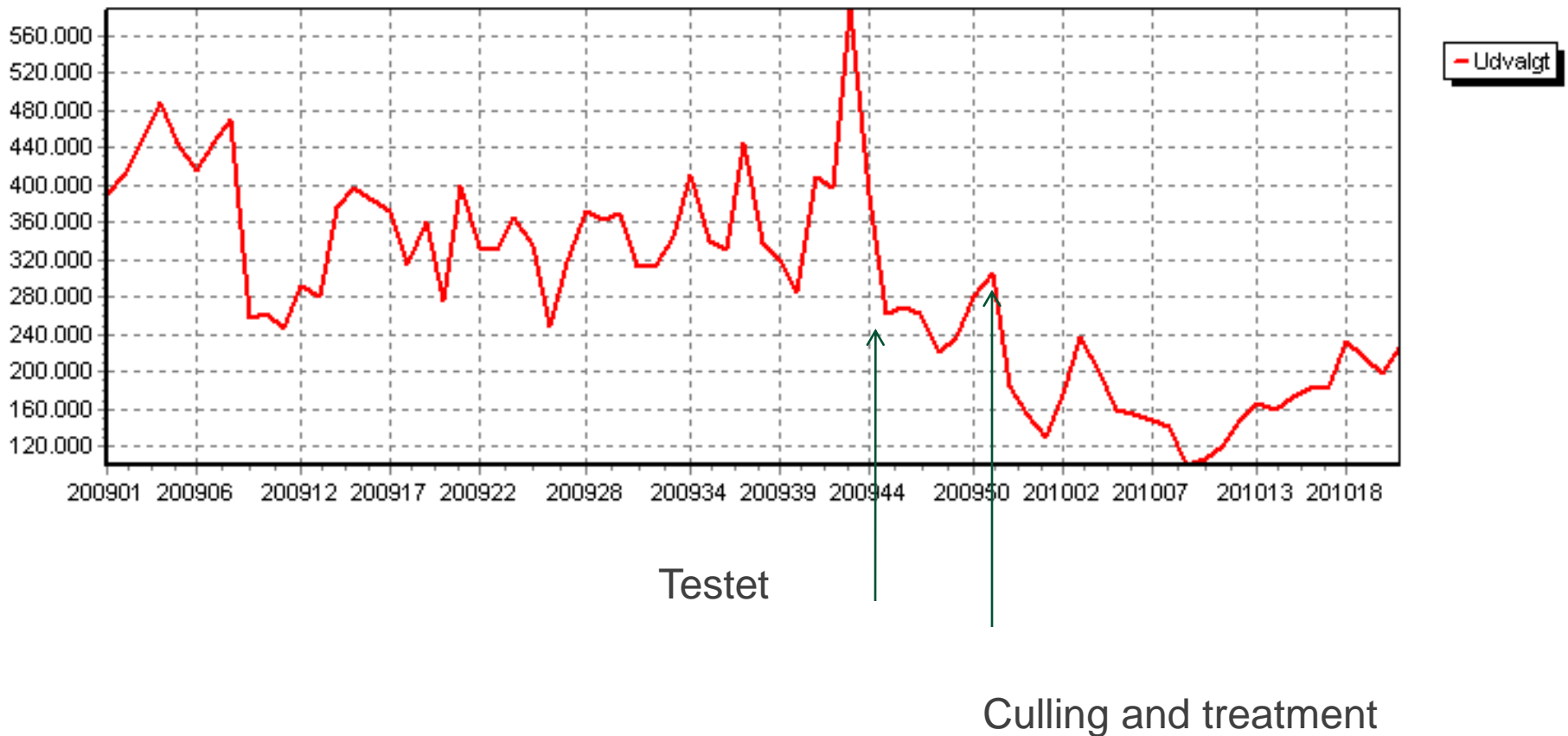
After around 6 months prevalence 34% (I/S T)

TBC



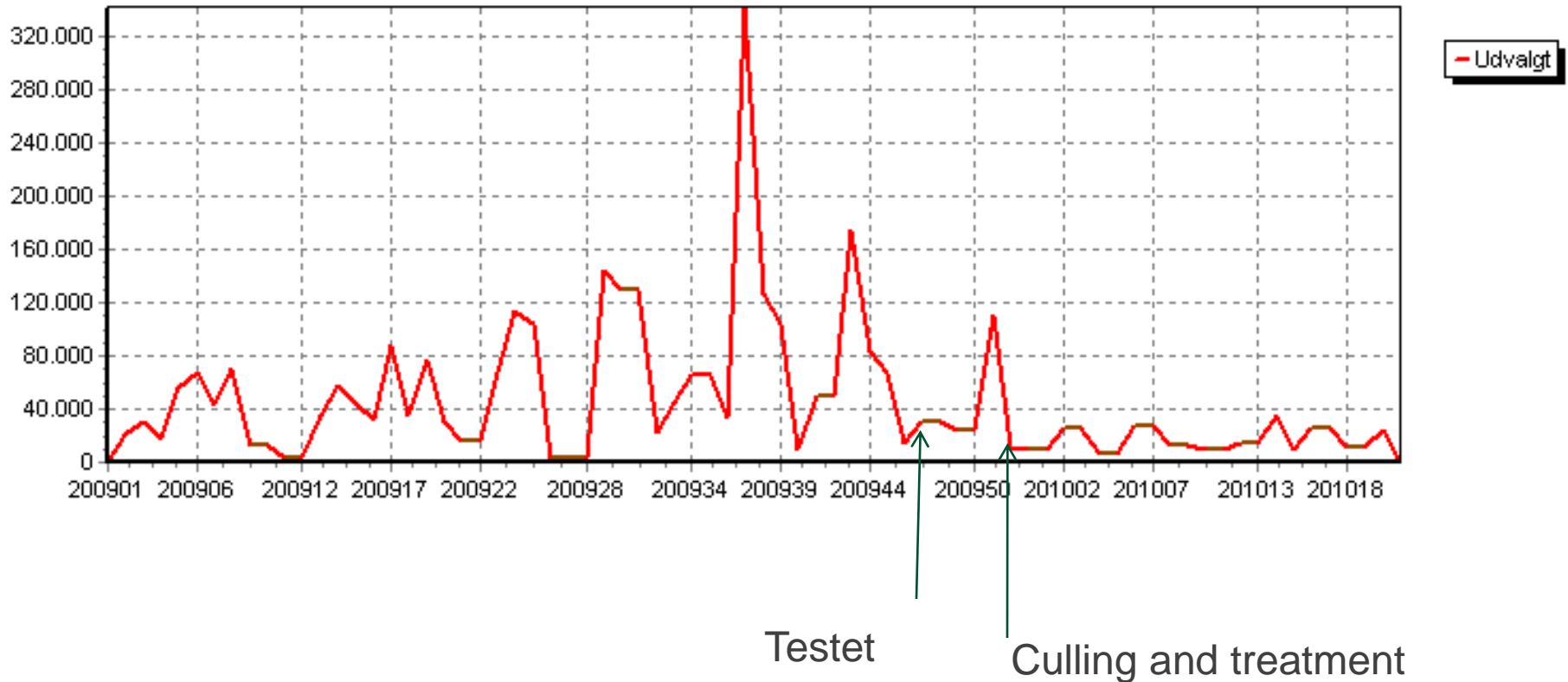
KJ at the edge of giving up (prevalence 61%)

SCC

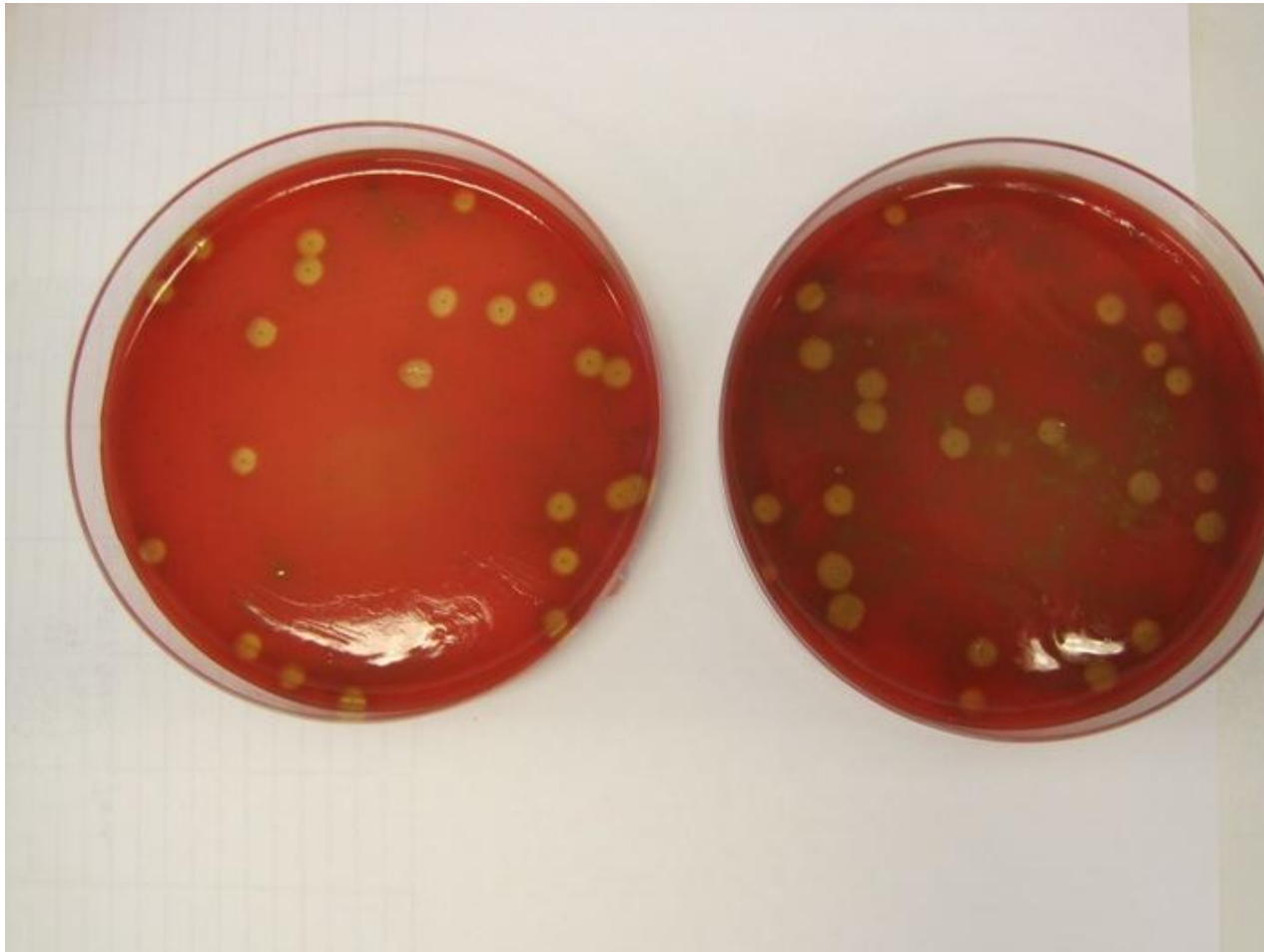


KJ at the edge of giving up (prevalence 61%)

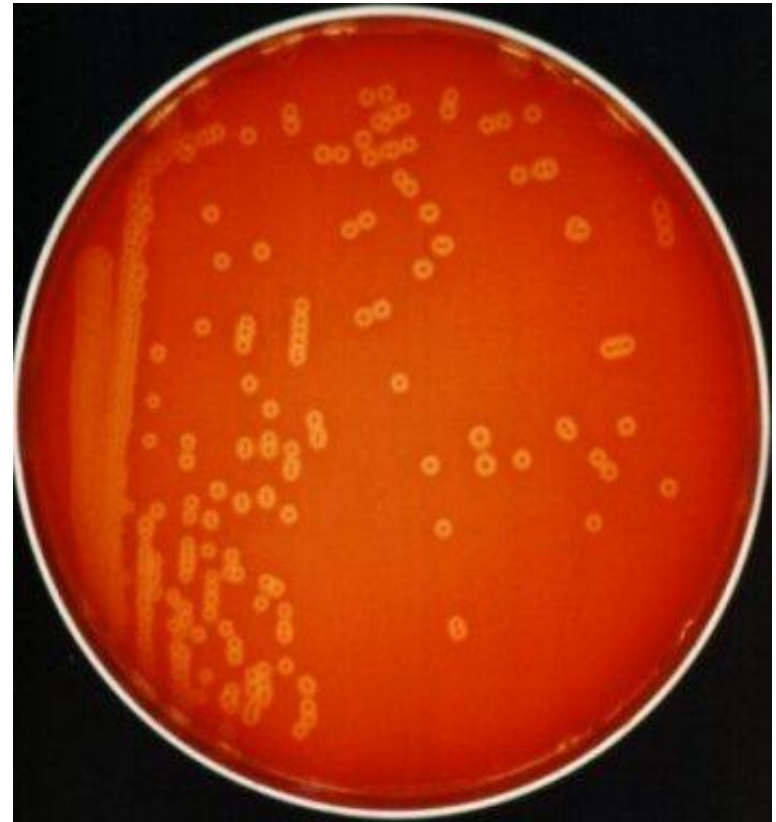
TBC



Blodagar + Stafylokok β - Toxin



Streptococcus agalactiae





Vores Mælk
- en ren fornøjelse