

Selective dry cow therapy

PhD study

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Online Udder health and dry period seminar
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KØBENHAVNS UNIVERSITET



STØTTET AF

Mælkeafgiftsfonden

SEGES
INNOVATION

Nadja Alsted

- Middle of Jutland
- Husband and 2 boys

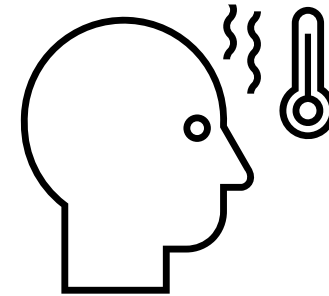


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- January 2021: Graduated as a veterinarian from University of Copenhagen
- March-May 2021: Research assistant DTU
- Maternity leave
- June 2022-Autumn 2026: PhD student at University of Copenhagen

Antimicrobial resistance

- How big is the problem?
 - 1.27 (→5) million deaths in 2019
- Status in EU and DK?
 - 35.000 deaths each year in EU
 - 0.5 tonnes intramammary in 2024 in DK



*<https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>

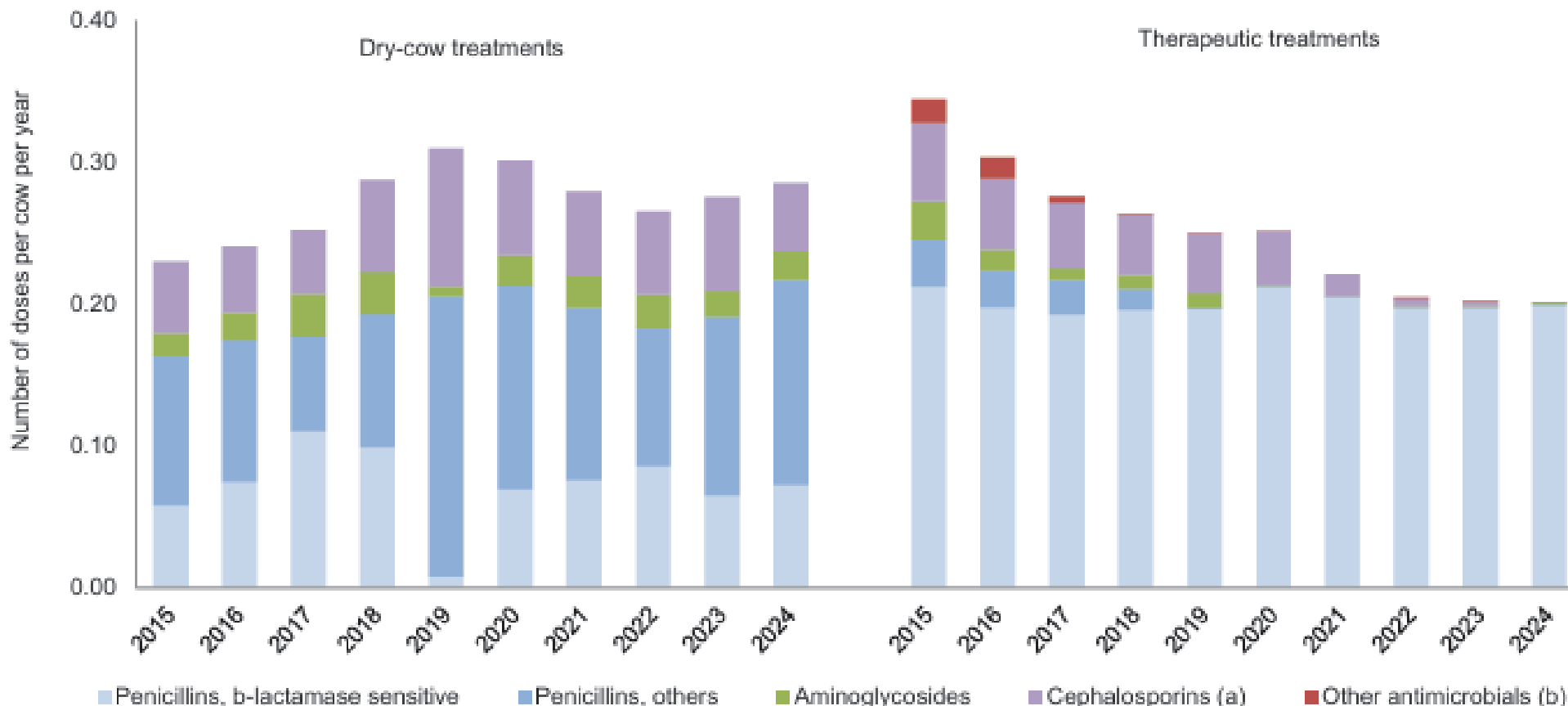
*[Trends-in-Animal-Antibiotic-Use-Europe.pdf](#)

* [Antimicrobial resistance in veterinary medicine | European Medicines Agency \(EMA\)](#)

* https://ec.europa.eu/commission/presscorner/api/files/attachment/875387/Factsheet%20Pharma%20AMR_EN.pdf

Antimicrobial resistance

Figure 4.6 Consumption of antimicrobials for intramammary application in cattle, treatments per cow per year, Denmark DANMAP 2024



For intramammary treatment, the consumption has been estimated as the number of doses divided by the estimated live biomass in the age group

Data for 2024 were extracted from VetStat on 20 May 2025

Combination products are split into active compounds

a) 1st generation cephalosporins only

b) Includes lincomycin for dry-cow treatments. For therapeutic treatment, mainly sulfonamides-trimethoprim, but also lincomycin and bacitracin

Antimicrobial resistance

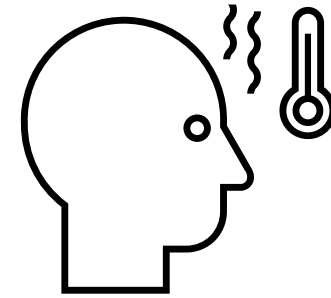
Antimicrobial usage and resistance

Goal

- 50% ↓: 2018-2030
- No BDCT

What can we do?

- Research



*<https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>

*[Analysis of antimicrobial consumption and resistance \('JIACRA' reports\) | European Medicines Agency \(EMA\)](#)

*[https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023H0622\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023H0622(01))

Selective dry cow therapy with a responsible use of antimicrobials

- Review
- Dry cow therapy with or without antimicrobials
- Quarter-based vs cow-based dry cow therapy



Research question - Review

What are the currently reported differences in outcomes for AMU and udder health comparing Q-SDCT to C-SDCT within clinical trials?

Quarter- or Cow-based Selective Dry Cow Therapy: A Scoping Review

5 studies – 7
papers

Australia,
New Zealand,
USA, UK

1990-2022

Comparison difficult

- Treatment criteria
 - C-SDCT: bacterial culture, clinical mastitis or SCC
 - Q-SDCT: bacterial culture, CMT, Minnesota Easy 4Cast Plate
- Major pathogen vs all pathogens
- Different definitions of udder health outcomes

Results - Review

	Q-SDCT	C-SCDCT
Bacteriological cure*	66-98.3 %	66-94 %
New intramammary infection (NIMI)*	3.2-21 %	3.9-19.8 %
Clinical mastitis in dry period	0.34-6.8 %	0.91-5.5 %
Clinical mastitis in next lactation	4.4-15.4 %	6.4-13.5 %
Antimicrobial usage – proportion of treated quarters	29.2-63.9 %	26.7-50 %
Antimicrobial usage – tubes per bacteriological cure	3.2-4.3	6.4

*1 paper: significantly higher risk in Q-SDCT

Conclusion of the different studies - review

- Study 1: C-SDCT > Q-SDCT
- Study 2: BDCT > SDCT
- Study 3: SDCT > BDCT
- Study 4: Q-SDCT or C-SDCT – depending on different factors
- Study 5: C-SDCT > Q-SDCT → Q-SDCT as alternative

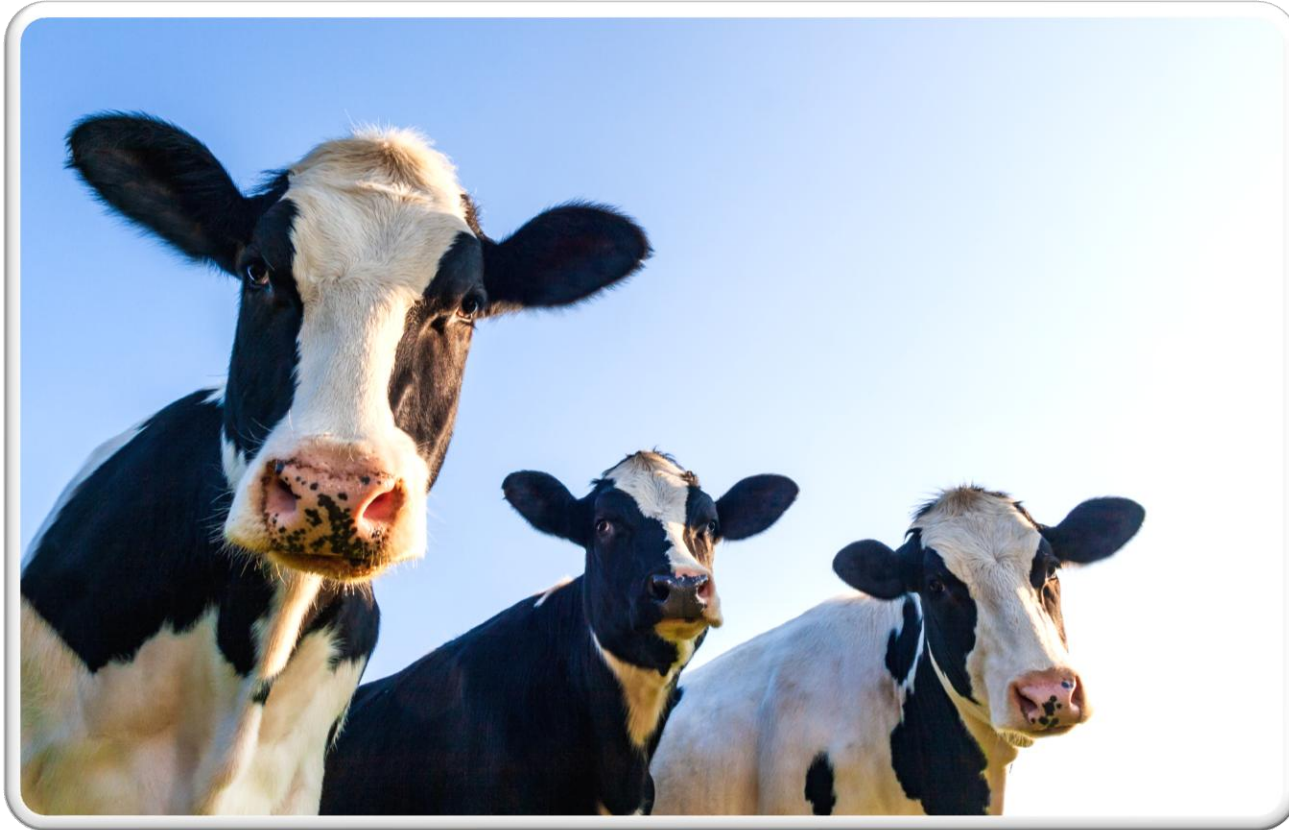
Research question and conclusion – Review

What are the currently reported differences in outcomes for AMU and udder health comparing Q-SDCT to C-SDCT within clinical trials?

Research question and conclusion – Review

- **Increase in NIMI (1 study)**
- **Increase in bacteriological cure (1 study)**
- **No reported significant difference in antimicrobial usage**

How do you do dry cow therapy?



[Click to download as image](#)

Dry cow therapy in Denmark

Legislation

- 2 x DHI recordings of SCC >200,000 cells/mL in the last 4 months, or
- 1-2 pathogens detected in bacterial culture (NOT on-farm tests), or
- 1 or more treatment-required pathogens detected in PCR

Selection of cows for treatment in practice

- High SCC cows
- Risk cows with low SCC are tested by: bacterial culture

OR

- PCR – from DHI recordings

Research question - Cure with or without dry cow therapy

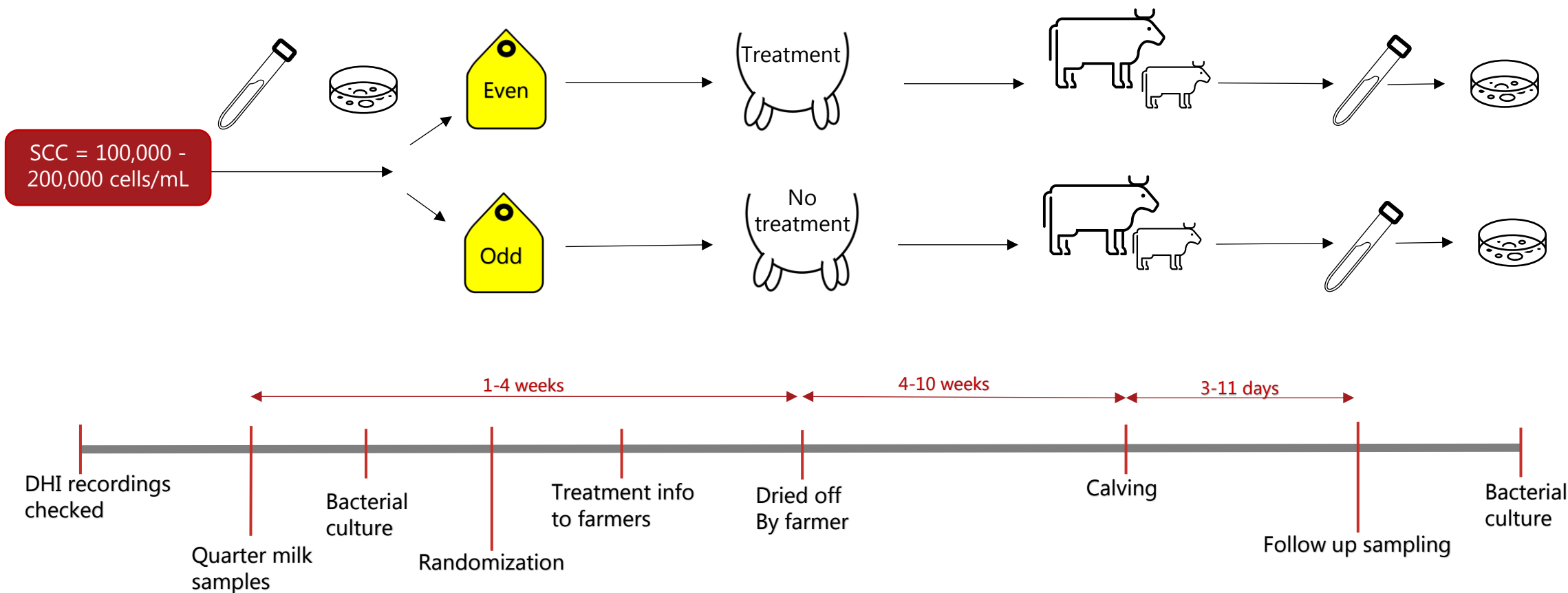
What is the impact of bacteriological cure when drying off with or without antimicrobials in cows with moderate SCC?

Comparison of antimicrobial vs no dry cow therapy for bacteriological cure in dairy cows with moderate SCC – A non-inferiority randomized controlled trial

- Reduce antimicrobial usage
- Compare bacteriological cure in treated and non-treated cows



Cure with or without dry cow therapy - Design



Cure with or without dry cow therapy - Results

- 301 quarters
- Treatment: 99.4%
- No treatment: 78.9%
- Difference of 20.5% points
- Antimicrobial usage
- Treatment: 100%
- No treatment: 0%

Research question - Cure with or without dry cow therapy

What is the impact of bacteriological cure when drying off with or without antimicrobials in cows with moderate SCC?

Research question - Cure with or without dry cow therapy

99.4% bacteriologically cured in the treatment group

78.9% bacteriologically cured in the no treatment group

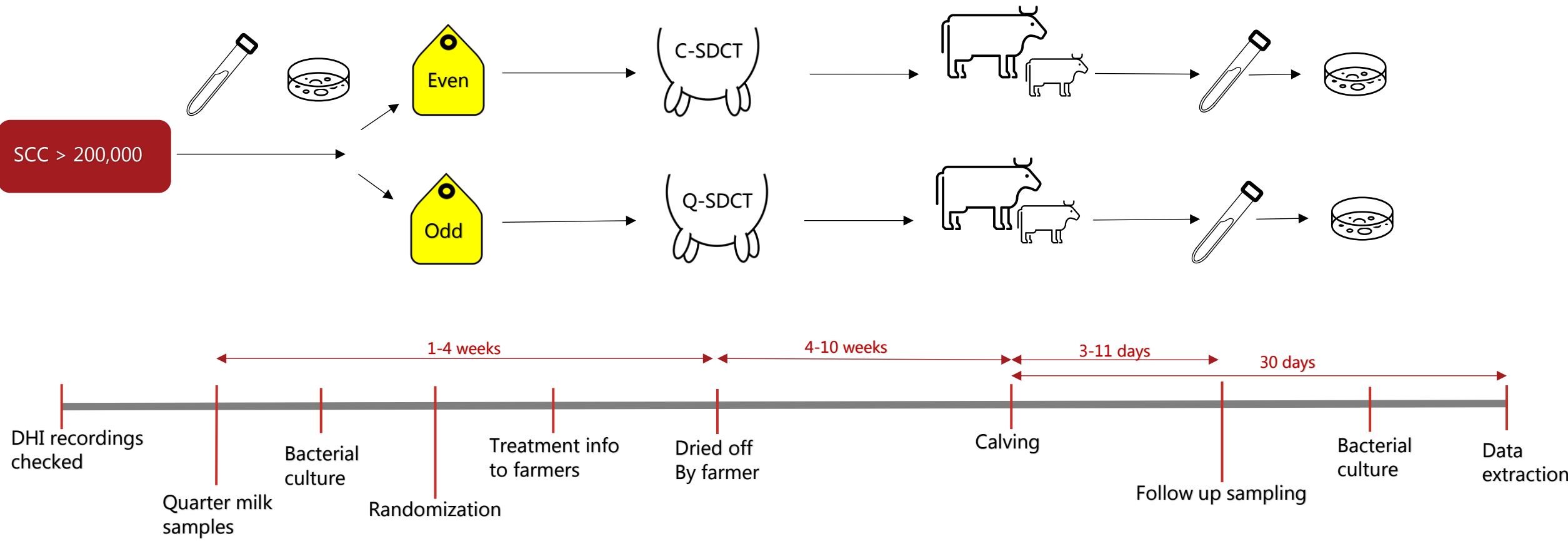
Research question – Q-SDCT vs C-SDCT

What is the impact of udder health outcomes and the reduction in AMU, when using Q-SDCT compared to C-SDCT?

Comparison of the effect of cow-based vs quarter-based selective dry cow therapy on udder health

- New intramammary infection (NIMI)
 - Pathogen present after calving, not present before dry-off
- Bacteriological cure
 - Pathogen present before dry-off, not present post-calving
- Clinical mastitis (CM) treatment
 - A cow having at least 1 CM treatment during dry period and 30 DIM
- Antimicrobial usage (AMU)
 - Proportion of treated quarters at dry-off

C-SDCT vs Q-SDCT - Design



C-SDCT vs Q-SDCT - Crude udder health outcomes

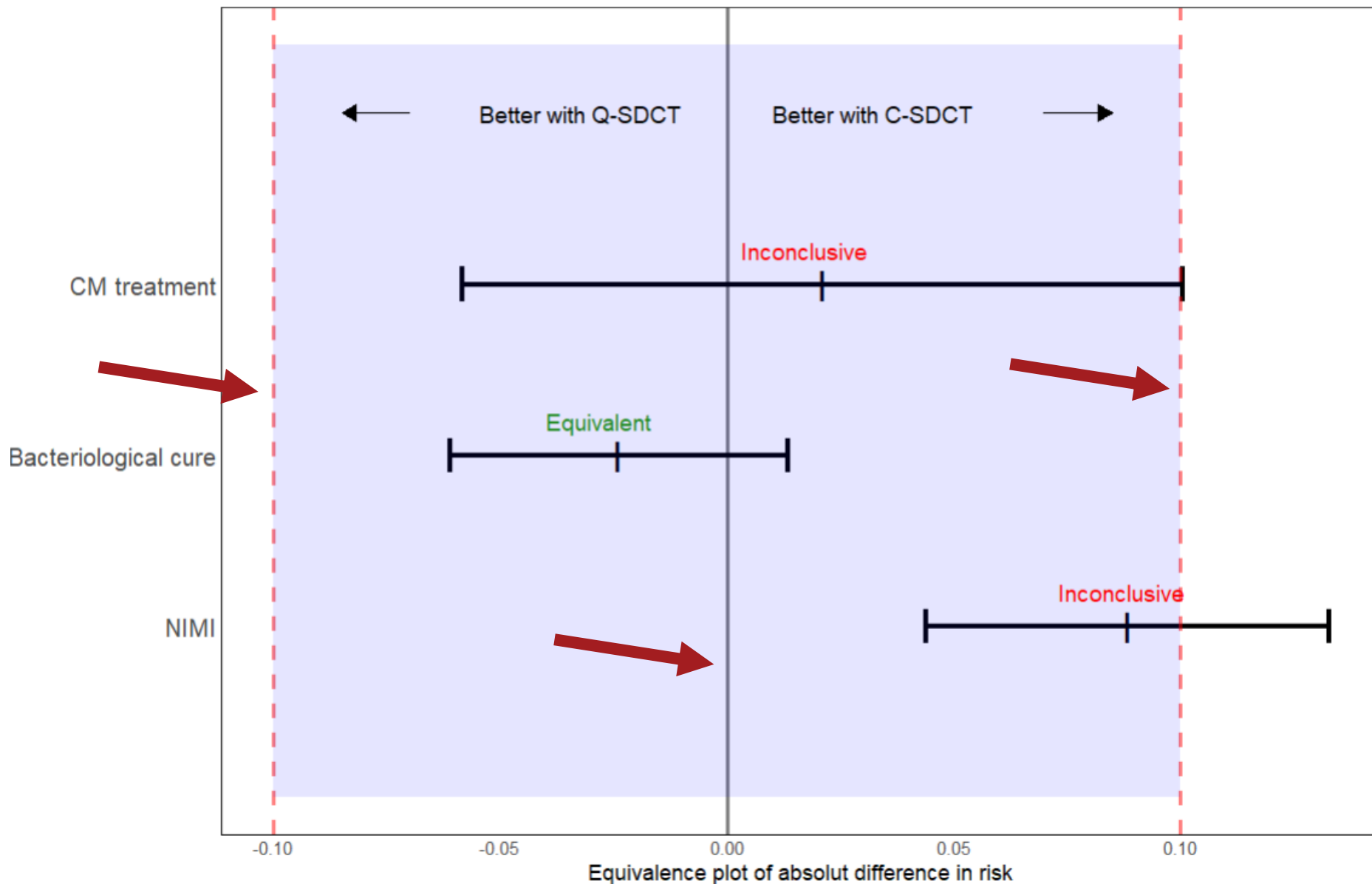
Outcome	Q-SDCT	C-SDCT
New intramammary infection* (N = 669 quarters)	18.0%	8.8%
Bacteriological cure (N = 363 quarters)	97.1%	94.7%
Clinical mastitis treatment (N = 197 cows)	10.4%	8.3%
Antimicrobial usage* (N = 888 quarters)	57.3%	100%

* Significant ($P < 0.05$) difference between groups

C-SDCT vs Q-SDCT – Multivariable model results

	Adjusted OR for Q-SDCT (ref. C-SDCT)	<i>P</i> -value	Other significant (<i>P</i> <0.05) factors
NIMI	2.3	<0.001	CMT ≥ 2 : ↓ risk Milk yield↑ : ↑ risk Cow SCC↑ : ↓ risk
Bacteriological cure	1.8	0.287	Primiparous cow: ↑ "risk"
CM treatment	1.3	0.615	Primiparous cow: ↓ risk

C-SDCT vs Q-SDCT – Equivalence



Research question – Q-SDCT vs C-SDCT

What is the impact of udder health outcomes and the reduction in AMU, when using Q-SDCT compared to C-SDCT?

Research question – Q-SDCT vs C-SDCT

- **A significant increase in NIMI = ~9% points difference**
- **Equivalence within a margin of 10% for bacteriological cure**
- **No significant difference in CM treatment**
- **A significant reduction in antimicrobial usage of >40%**

Summary

Review

- Low amount of papers
- Newer studies: Q-SDCT ~ C-SDCT

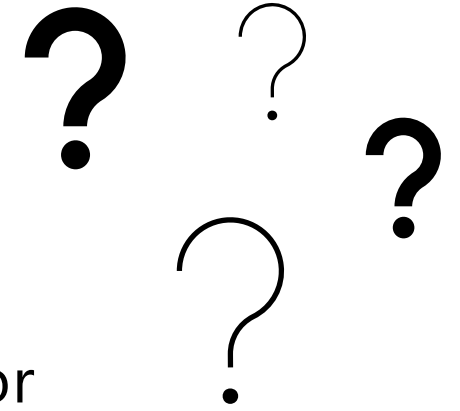
Treatment vs no treatment

- Bacteriological cure ↓ if cows with moderate SCC is not treated at dry-off
- 78.9% self cure in No treatment group

Q-SDCT vs C-SDCT

- ↑ in NIMI risk for Q-SDCT
- ↓ in antimicrobial usage for Q-SDCT
- Equivalence for bacteriological cure
- No significant difference for treatment of clinical mastitis

How can this be used in practice



- Farm-tailored solutions
- Q-SDCT in well-managed farms with low NIMI
- For cows with moderate SCC - only test and possibly treat specific cows (risk cows, valuable cows)
- More samples
- Increased risk of error
- More trials
- Implementing Q-SDCT
- Udder health vs antimicrobial usage

STØTTET AF

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