

THE NEW COMBIFOSS™ 7 DC – AN UPDATE ON DIFFERENTIAL SOMATIC CELL COUNT AND OTHER ADVANCEMENTS IN MILK TESTING

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DR. DANIEL SCHWARZ, FOSS, DENMARK



THE GLOBAL STANDARD
FOR LIVESTOCK DATA

Annual Conference
ICAR2018.NZ

7 – 11 February 2018

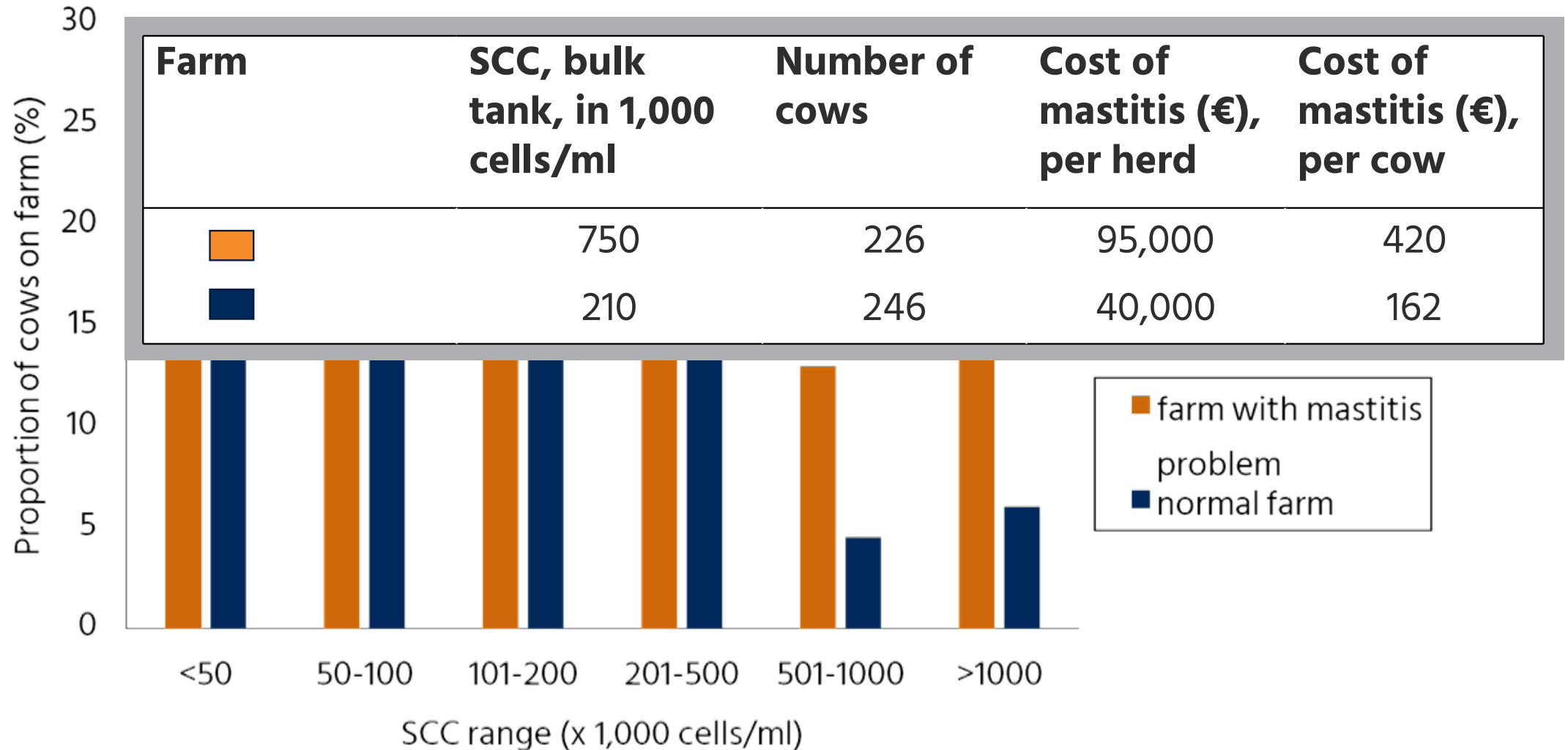
Aotea Centre
Auckland,
New Zealand



ANALYTICS BEYOND MEASURE

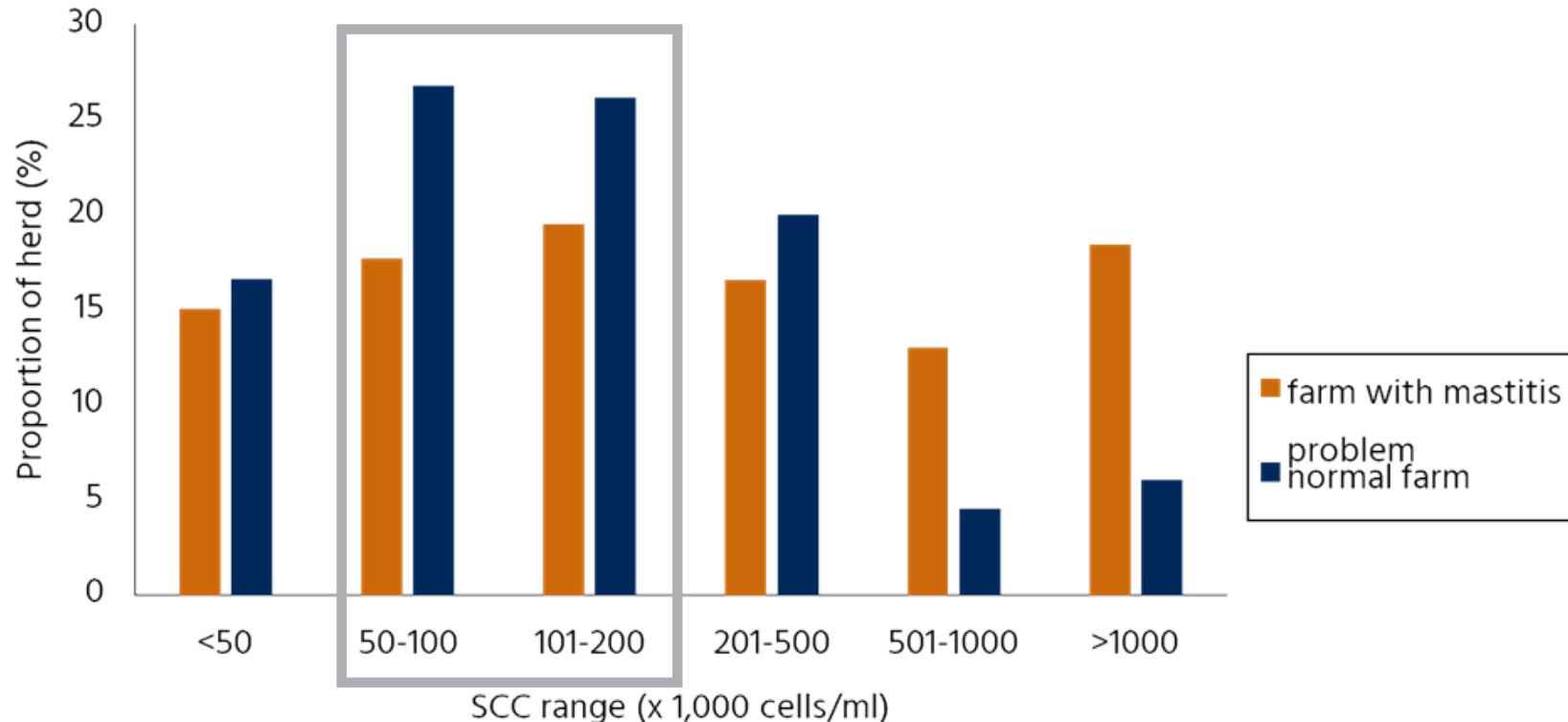
THE VALUE OF WORKING WITH SCC

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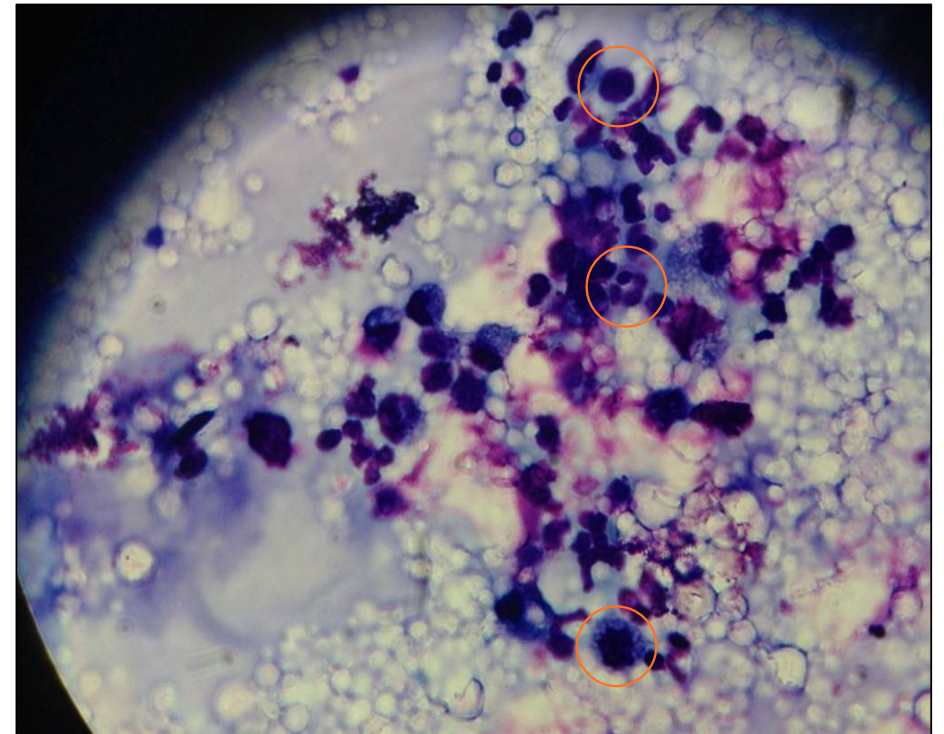
DAIRY HERD IMPROVEMENT TESTING – THE FUTURE

- “We need to provide dairy farmers with more information for improved decision making through DHI testing.”
- Mastitis: Differential Somatic Cell Count (DSCC) as a new, additional indicator



THE CONCEPT AND TECHNOLOGY BEHIND DSCC

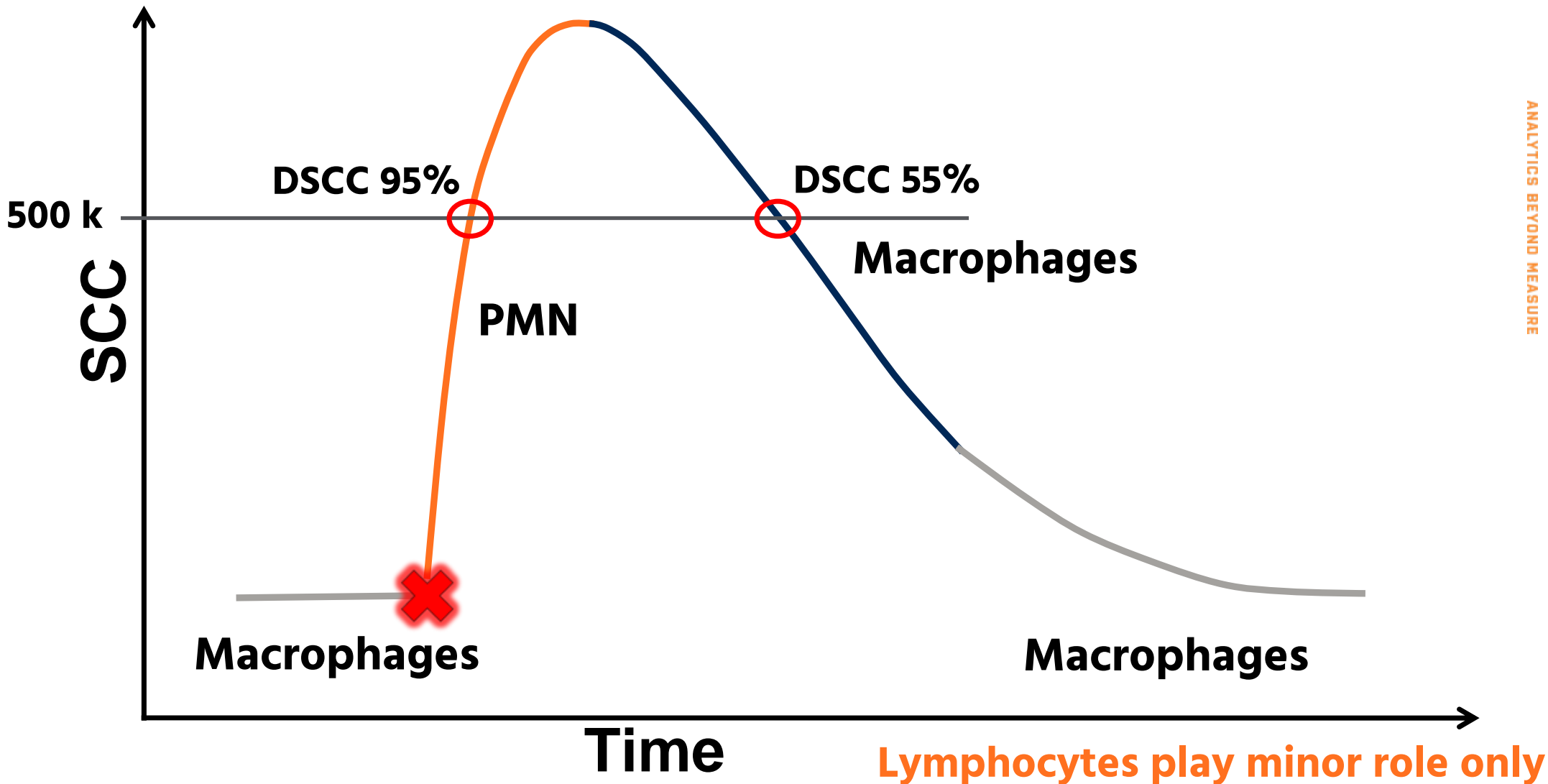
1. Lymphocytes
2. Polymorphonuclear neutrophils (PMN)
3. Macrophages



Microscope spot, milk slide

MASTITIS CASCADE

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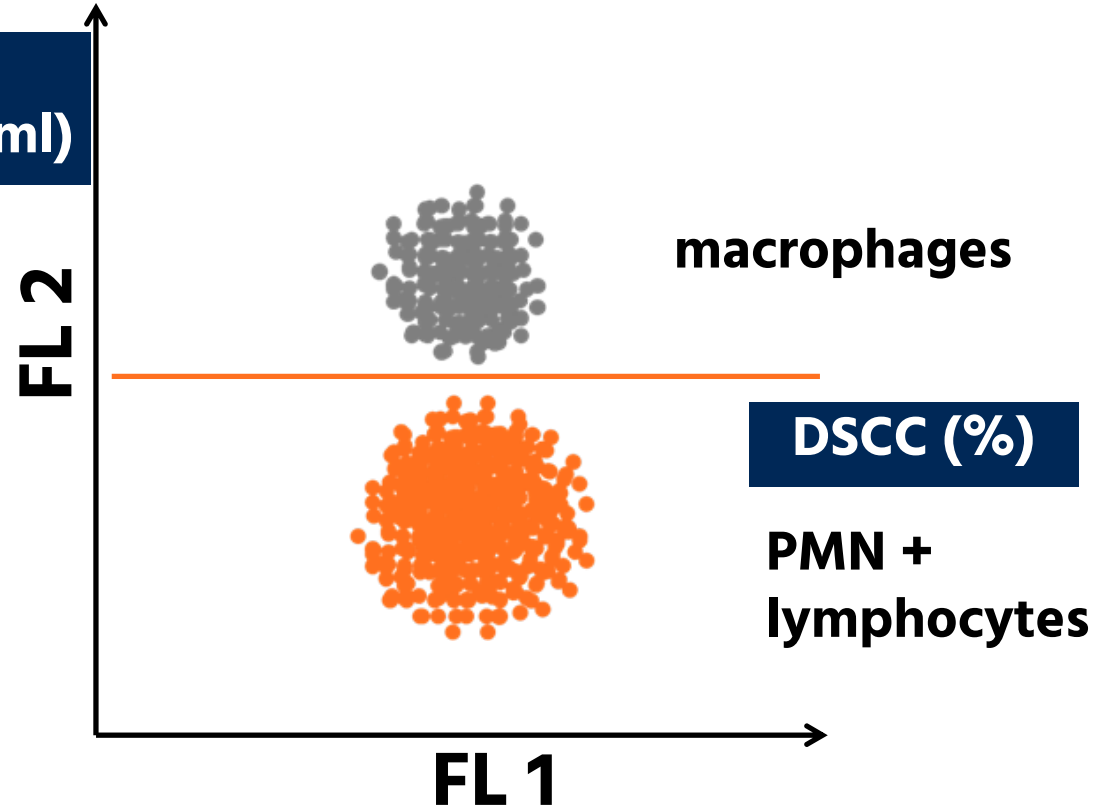
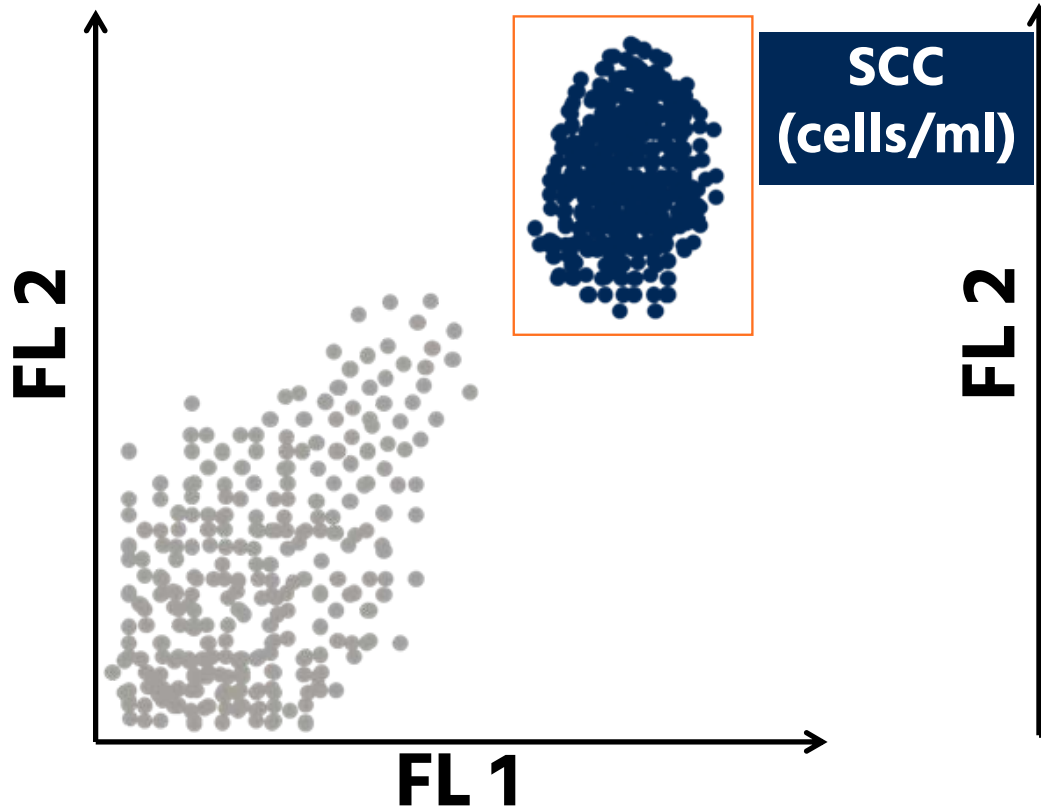


THE FOSS DSCC METHOD

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Analysis of SCC

Analysis of DSCC



ANALYTICS BEYOND MEASURE

EVOLUTION OF DSCC

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Differentiation of cells...

...valuable

...scientific method

...not feasible in connection with DHI programmes

New Fossomatic 7 DC with DSCC capability (600 samples/hour)

Focus on practical application of DSCC

2014 and before

2017

2018

**DSCC AS ADDITIONAL
INDICATOR FOR UDDER
HEALTH/MASTITIS
MONITORING**

DEVELOPMENT OF DSCC AND SCC DURING CONTROLLED MASTITIS

STUDY PLAN

- 8 healthy cows recruited

Sampling scheme:

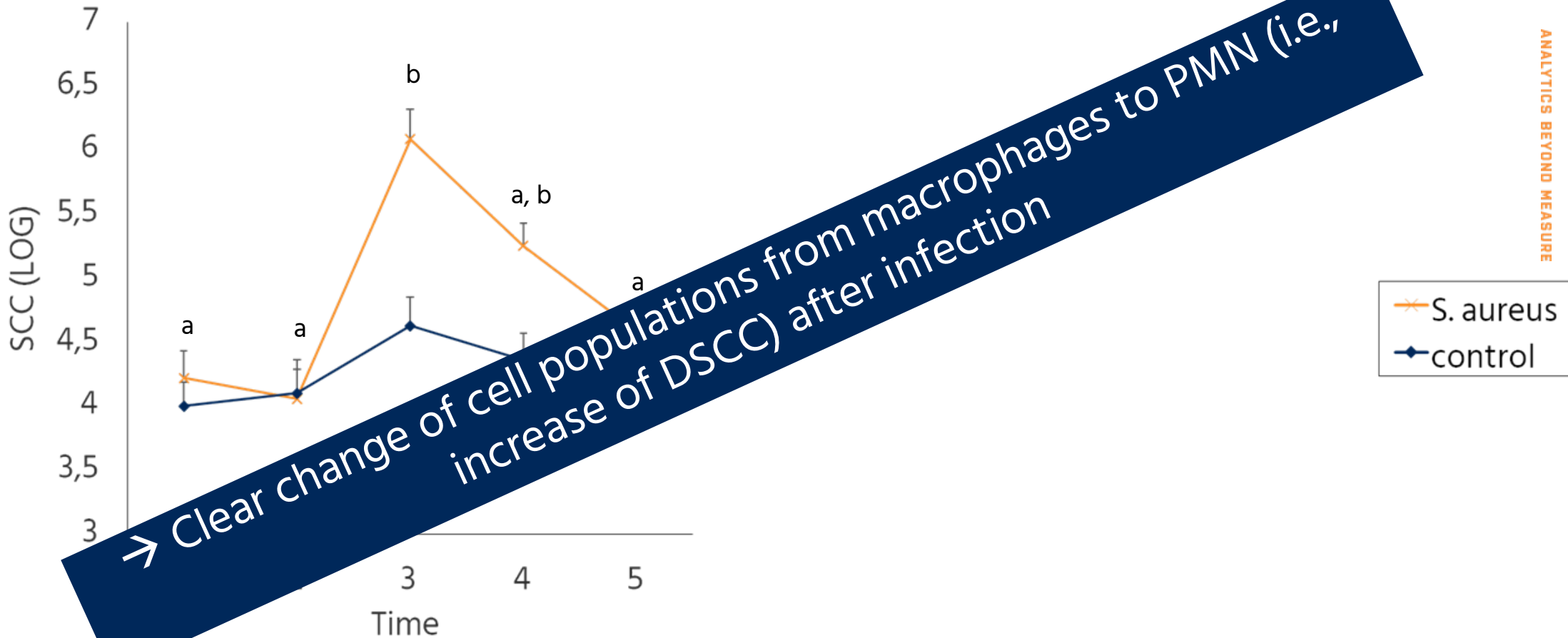
Days post infection	-3	-2	-1	0	0.5	1	1.5	2	2.5	3	4	5	6	7	14
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- Sample types: quarter foremilk, cow-composite
- Parameters: SCC, DSCC, bacteriological examination

S. AUREUS – SCC AND DSCC RESULTS

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ANALYTICS BEYOND MEASURE



→ Clear change of cell populations from macrophages to PMN (i.e., increase of DSCC) after infection

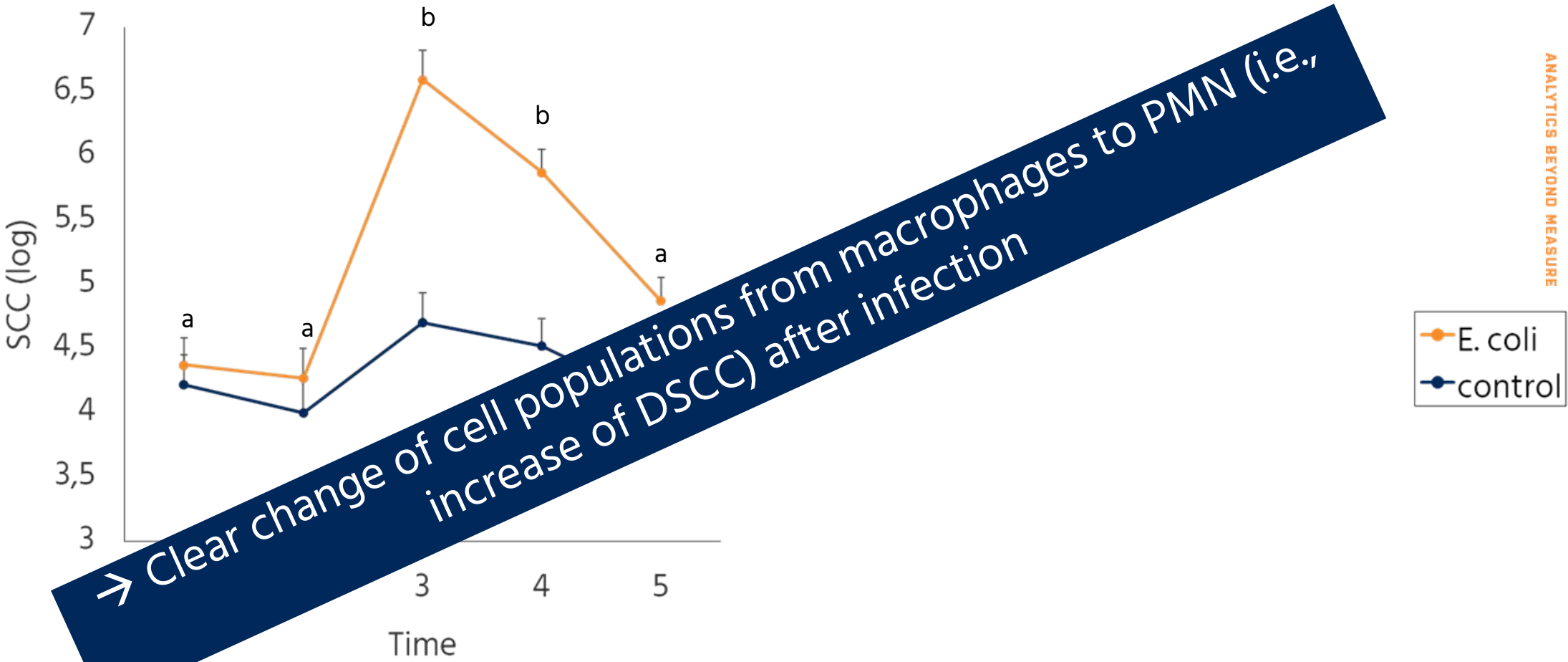
Wall et al., 2018 (submitted)

a, b: indicate significant differences (P < 0.05)

E. COLI – SCC AND DSCC RESULTS

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ANALYTICS BEYOND MEASURE

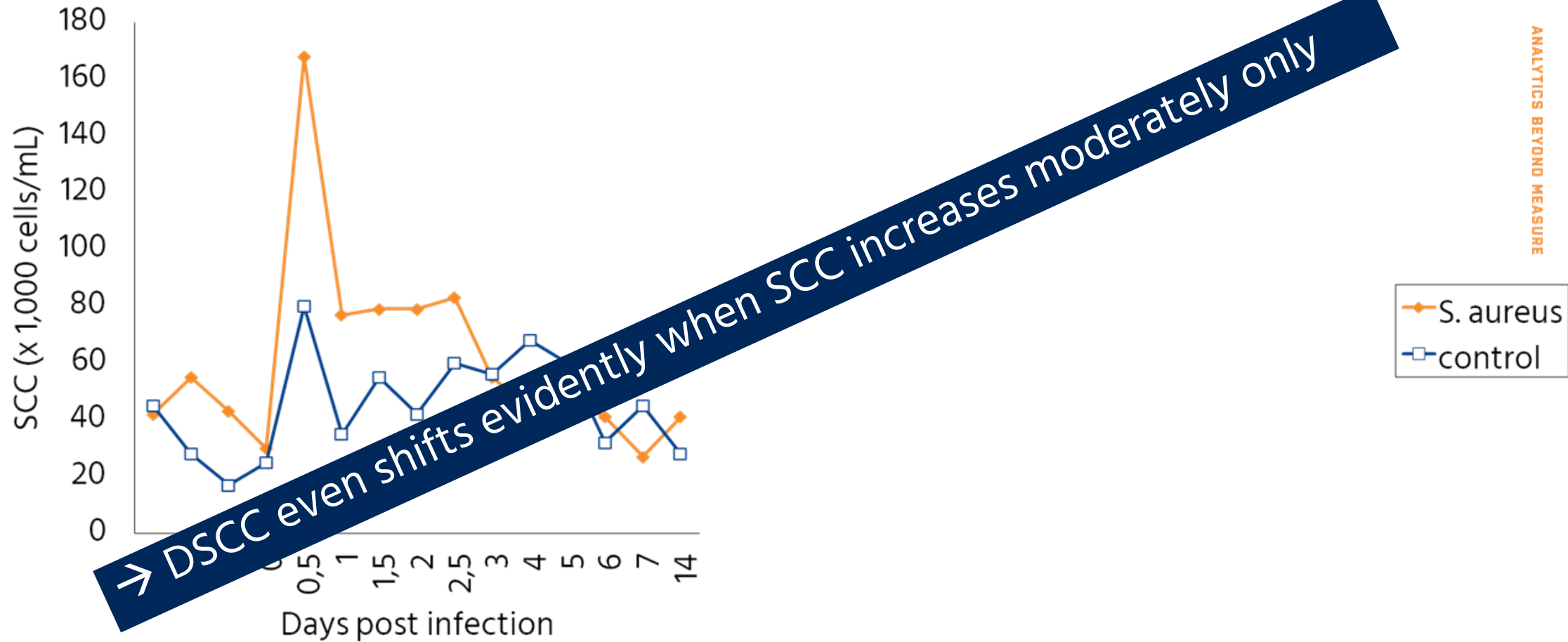


Wall et al., 2018 (submitted)

a, b: indicate significant differences (P < 0.05)

S. AUREUS INFECTION – INDIVIDUAL COW RESULTS

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Wall et al., 2018 (submitted)



- Determination of the stage of mastitis using combination of SCC and DSCC:
 - Early stage: High SCC (>200,000 cells/ml), high DSCC values (>86%)
 - Late stage: High SCC (>200,000 cells/ml), low DSCC values (<86%)
- Clearer reflection of an individual quarter in a cow-composite sample → not only SCC increase but also the shift of cell populations (DSCC) reflected

ON-GOING DSCC PROJECTS

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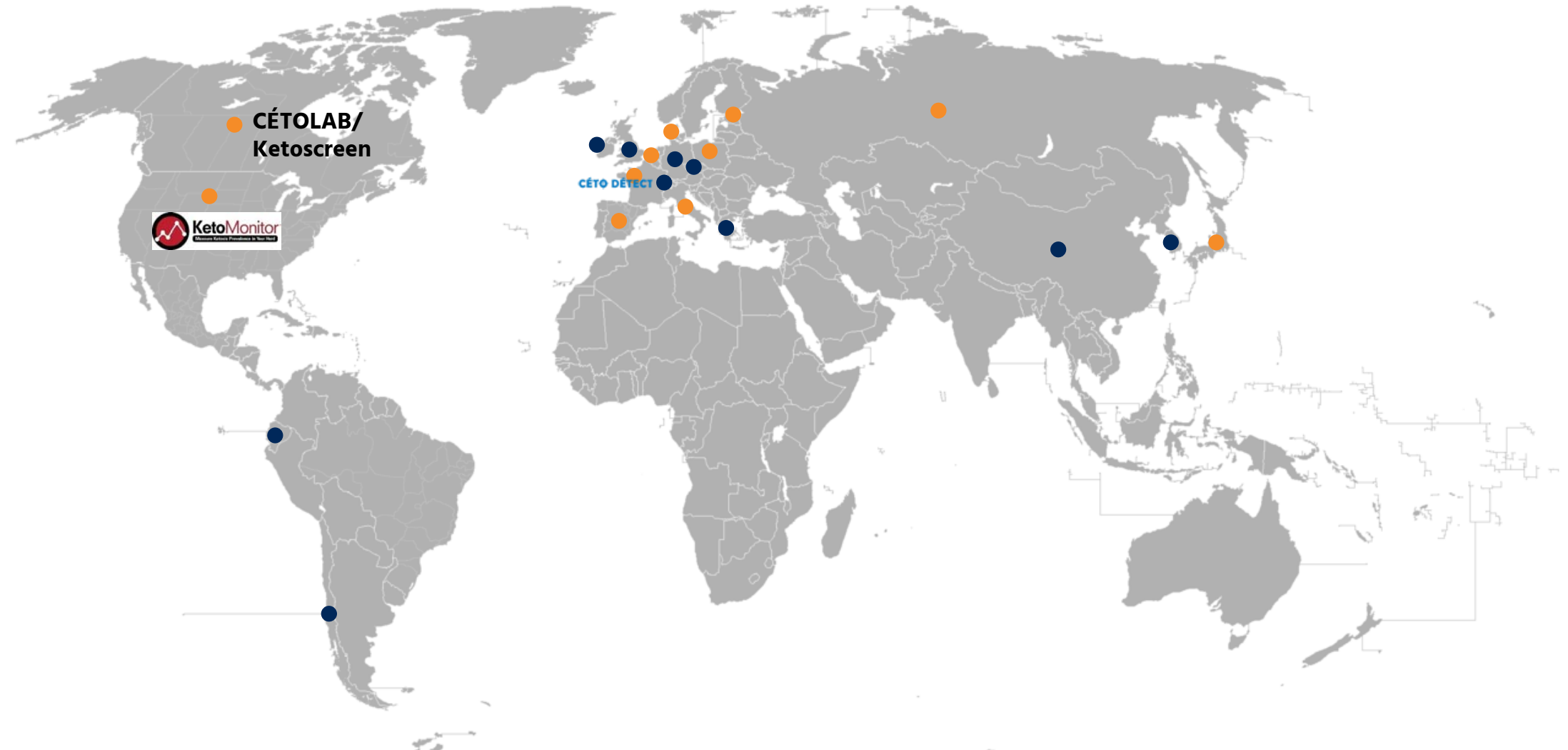
Project	Objective	Status
Denmark	Longitudinal study to develop general guidelines for application of DSCC in practise	In progress

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KETOSIS SCREENING

FOSS'S KETOSIS SCREENING AROUND THE WORLD

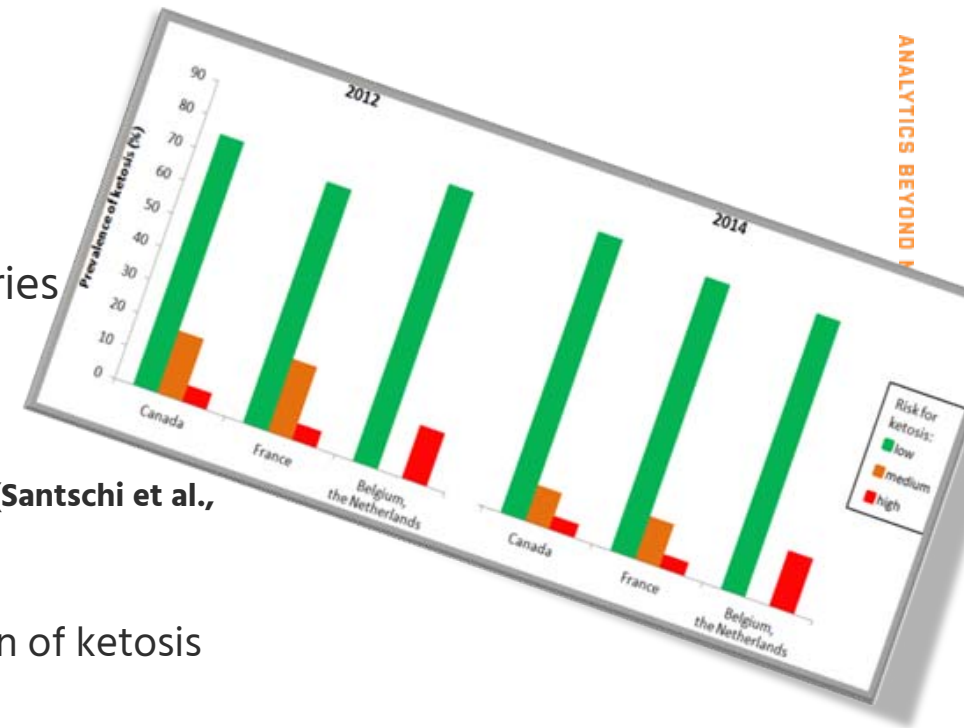
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KETOSIS SCREENING – A HIGHLY VALUABLE SERVICE

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- Simple, practical, rapid, and inexpensive tool
- Evidence of success of ketosis screening in various countries
- Latest developments:
 - Milk BHB and effects of ketosis on dairy cow performance (**Santschi et al., 2016**)
 - Risk factors associated with ketosis (**Tatone et al., 2017**)
 - Logistic and multiple linear regression models for prediction of ketosis (**Chandler et al., 2018**)



De Roos et al., 2007; Schwarz et al., 2015; Coburn et al., 2017; Schwarz, 2017

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FATTY ACID ANALYSIS

FATTY ACID ANALYSIS

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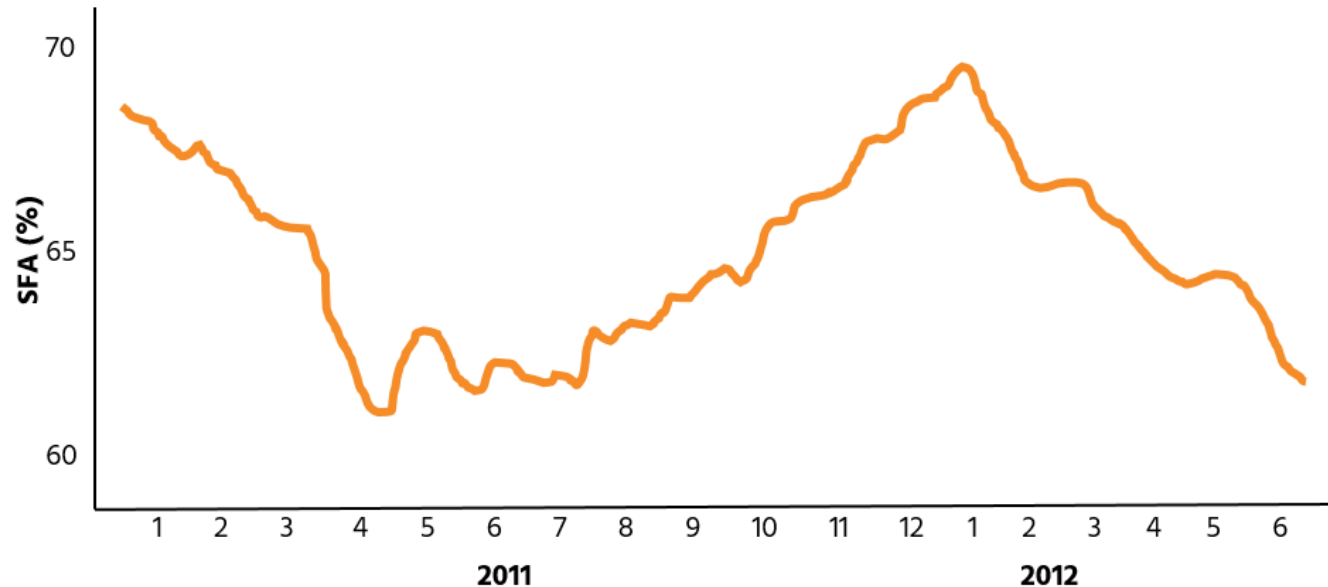
- Visiolait – optimisation of feeding:
 - Energy and protein efficiency
 - Rumen activity
 - Health and fertility

→ Used successfully in France and Germany



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- National milk laboratories, UK:
 - Fatty acid profiling as basis for production of value-added dairy products



A MESSAGE TO TAKE HOME

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- Mastitis still most costly disease on dairy farms
- SCC and DSCC as a new tool to improve mastitis management
 - First indications: e.g., differentiation of early vs. late stage of mastitis
 - Various practical applications in development
- Other value-added services: Ketosis screening and fatty acid analysis successfully used in many countries around the world

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das@foss.dk



@SchwarzD123
@FOSSAnalytical



www.linkedin.com/in/daniel-schwarz84
www.linkedin.com/company/6750/