Use of somatic cell count patterns for selection against mastitis

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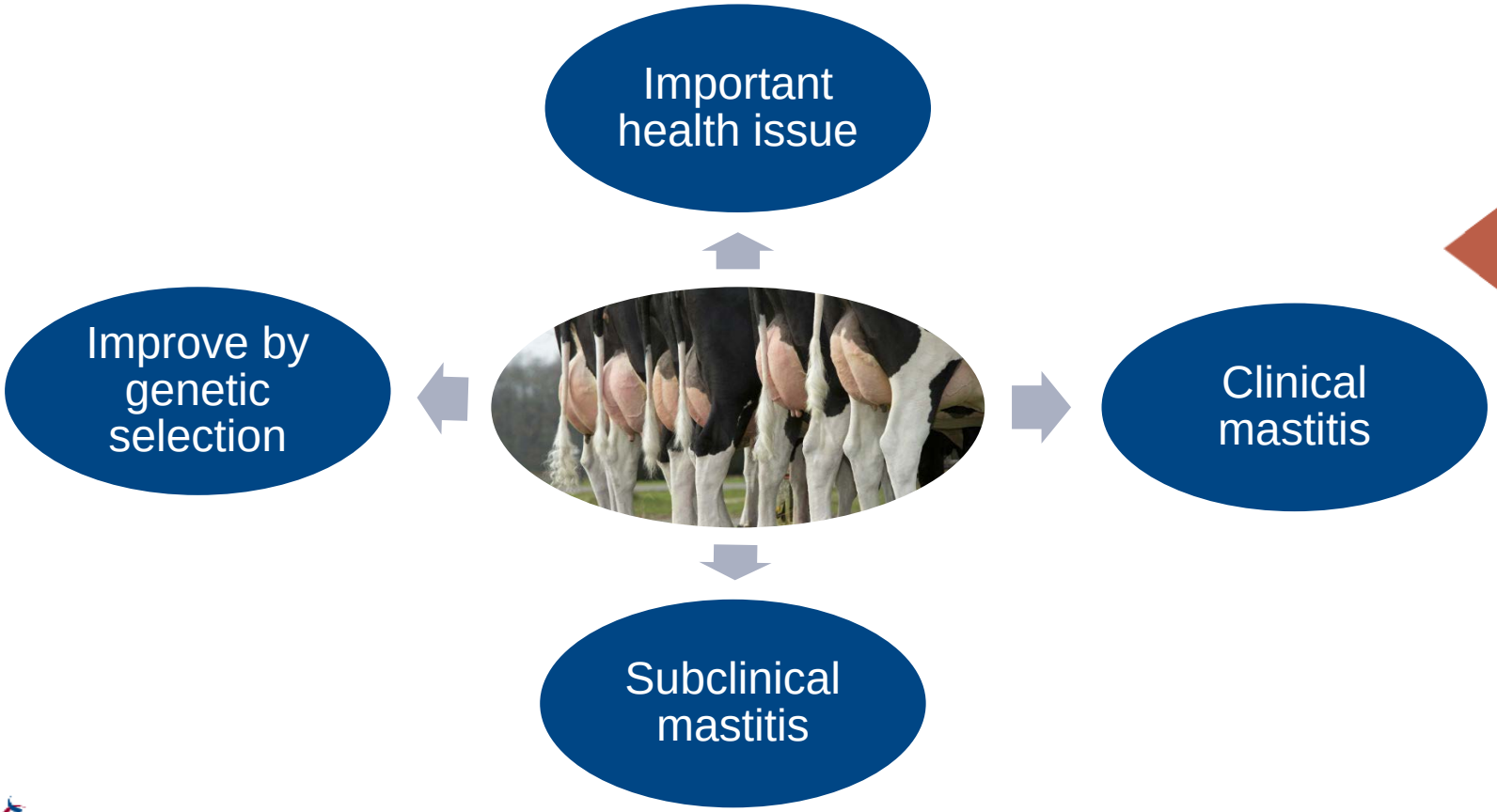
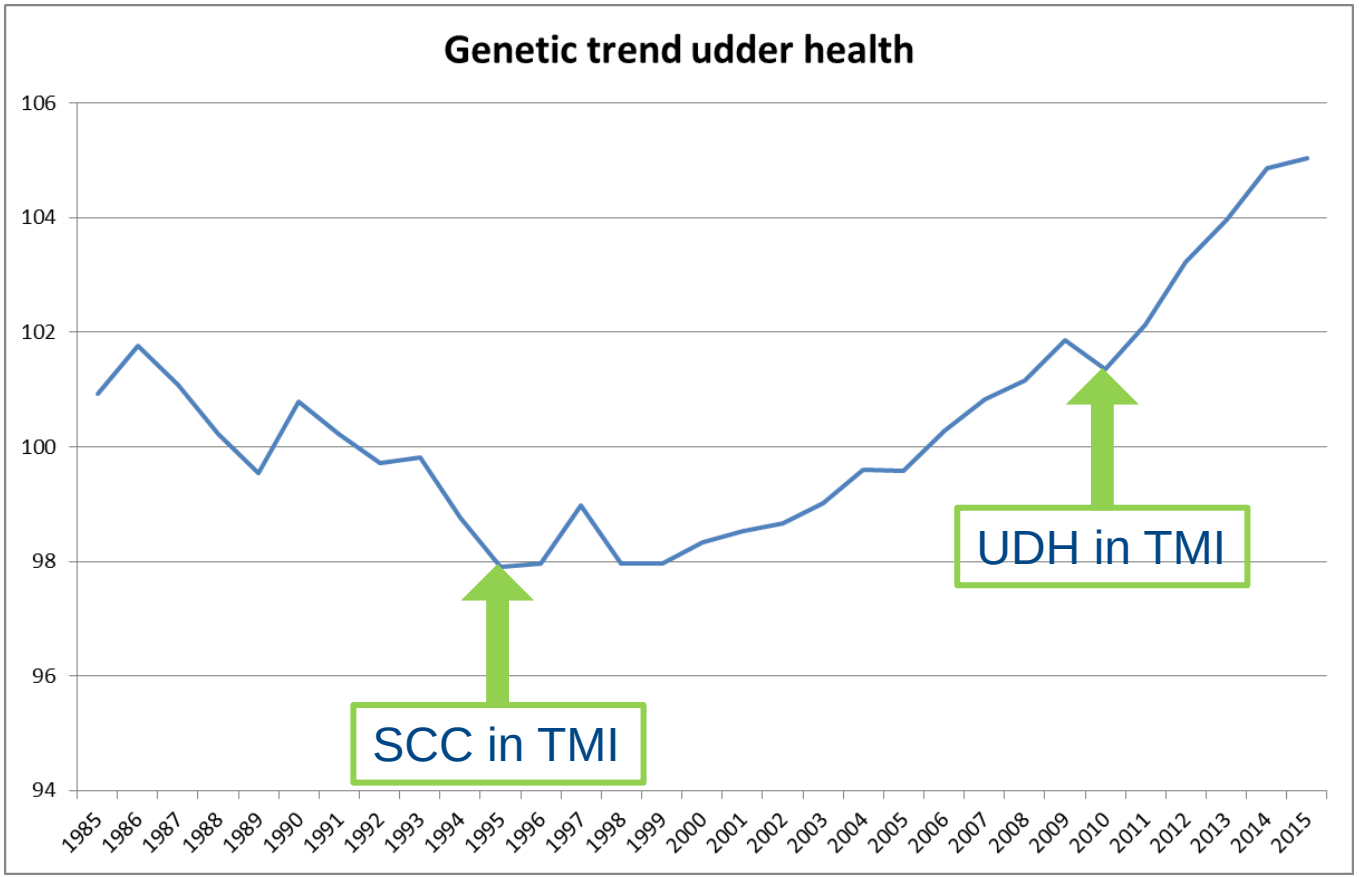
Animal Evaluation Unit

EAAP 2016 – August 31, Theatre Session 36

Introduction



Introduction



Trait definition

Udder health index consists of breeding goal traits:

- **Subclinical mastitis (SCM)** based on SCC pattern
- **Clinical mastitis (CM)** based on correlation with SCM and 5 indicator traits + *observations on CM*

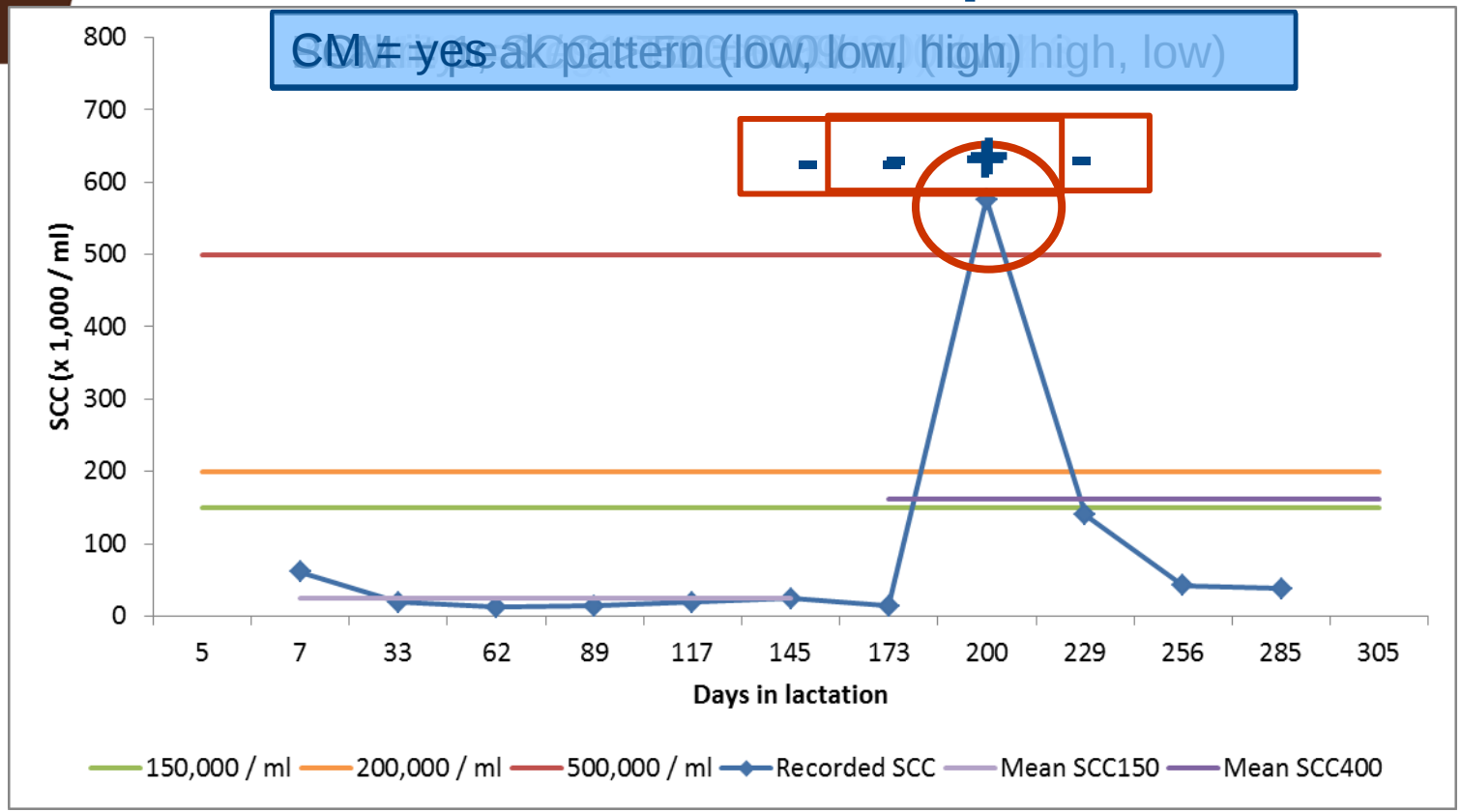
Index based on average economic damage of 1 case of each:

$FW_{UDH} = 100 + \mathbf{0,477} * [FW_{SCM} - 100] + \mathbf{0,641} * [FW_{CM} - 100]$

Trait definition

Trait	Description	h^2	$\tilde{A}_g$
SCS150	Mean 2log(somatic cell count) day 5 - 150 lactation	0.17	43.26
SCS400	Mean 2log(somatic cell count) day 151 - 400 lactation	0.17	38.79
Infection	Absence/presence of SCC > 150,000 cells/ml	0.12	0.11
Intensity	Proportion SCC > 150,000 cells/ml	0.16	8.86
Peak	Total number of peaks in SCC	0.11	0.11
SCM	Absence/presence of SCC > 150,000 cells/ml in 3 consecutive measurements	0.06	0.07
CM	Correlations and CM registrations	0.06	0.04
UHI	**Combination of BV SCM and BV CM**	**0.09**	**0.05**

Method based on SCC patterns



SCS150 = 14.6

SCS400 = 17.3

Infection = Yes

Severity = 0.09

Peak = 1

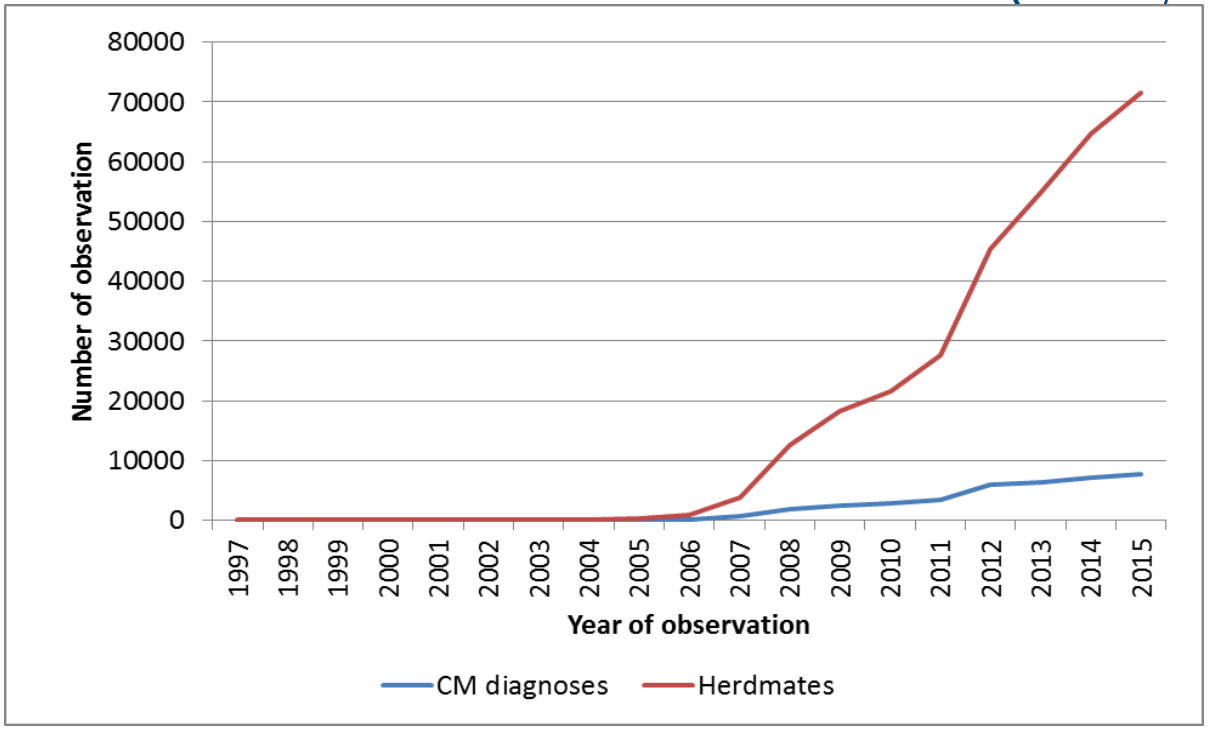
SCM = Yes

CM = Yes

Update breeding value CM

Adding observations of CM

- Direct observations on animals with CM (# 38,851)
- Information of herd mates at time of infection (# 322,379)



Practical validation of the method

Changes in reliability after adding CM observations

	Number of daughters with CM observations						
Rel[1]	0	1 - 10	11 - 25	26 - 50	51 - 100	> 100	Overall
0 - 50	0.1	0.5	2.0				0.4
51 - 70	0.0	0.4	0.8	2.5			0.4
71 - 80	0.0	0.3	0.6	0.9			0.3
81 - 90	0.0	0.1	0.3	0.5	0.7	1.2	0.2
91 - 95		0.0	0.0	0.1	0.3	0.7	0.3
96 - 99				0.0	0.2	0.2	0.2
Overall	0.0	0.3	0.5	0.5	0.4	0.4	**0.3**

Rel[1] = reliability of BV without CM observations

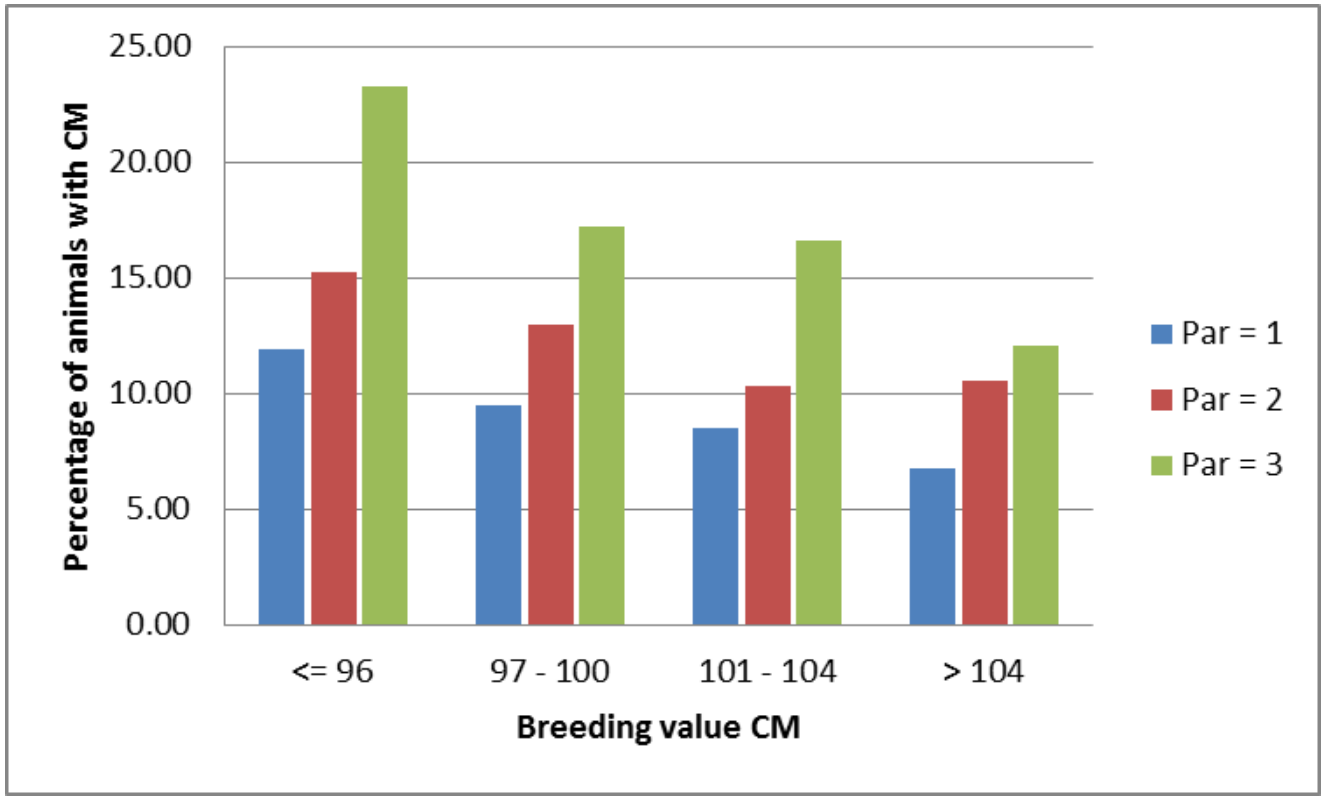
Practical validation of the method

Changes in breeding value after adding CM observations

	Number of daughters with CM observations						
Rel[1]	0	1 - 10	11 - 25	26 - 50	51 - 100	> 100	Overall
0 - 50	0.0	-0.1	0.0				0.0
51 - 70	0.0	0.0	-0.1	0.0			0.0
71 - 80	0.0	0.0	-0.1	-0.1	0.0		0.0
81 - 90	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
91 - 95		0.0	0.0	0.0	0.0	0.0	0.0
96 - 99				0.0	-0.1	0.0	0.0
Overall	0.0	0.0	-0.1	0.0	0.0	0.0	**0.0**

Rel[1] = reliability of BV without CM observations

Practical validation of the method



Conclusions

- SCC patterns is a basis for an accurate method to predict CM breeding values
  - Breeding values stay the same
  - Reliability increases slightly

- CM (+SCM) breeding values can be used to select against mastitis and improve udder health