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Effectiveness of selection for lower somatic cell count (SCC) in herds with different levels of SCC

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Conclusions

- Considerable GxE exists for SCC (and SCS) across levels of BMSCC
- Breeding values for SCC might be reassessed as they appear better predictors of average daughter performance and random regression models might help to adjust for heterogeneous variances

Objective

To enable selection for reduced SCC and improve genetic resistance for mastitis breeding values are estimated based on log-transformations of somatic cell count (SCS). The aim of this work was to examine i) whether SCC is genetically the same trait across herd levels of bulk milk somatic cell count (BMSCC) and days in milking (DIM), and ii) the predictive value of SCC and SCS breeding values.

Data

379 887 test day records of 25 715 cows in 461 Dutch dairy herds

Model

- Genetic parameters and breeding values for SCS and SCC came from a model that included simultaneously a third order random regression on days in milking (DIM) and a first order random regression on bulk milk somatic cell count (BMSCC), and residual variances across DIM and BMSCC, on 50% of the data
- Daughter performance, in herds with low and high BMSCC in the other 50% of the data, was regressed on sire breeding values i) for an average herd, or ii) sire breeding values for high or low BMSCC herd (sires had more than 100 test day records)

Results

Genetic correlations across DIM (d) and BMSCC (kcount)

table 1

		SCS[1]		SCC[2]	
	BMSCC	360	360	360	360
BMSCC	DIM	40	315	40	315
85	40	**0.88**	0.63	**0.54**	0.54
85	315	0.33	**0.88**	0.20	**0.38**

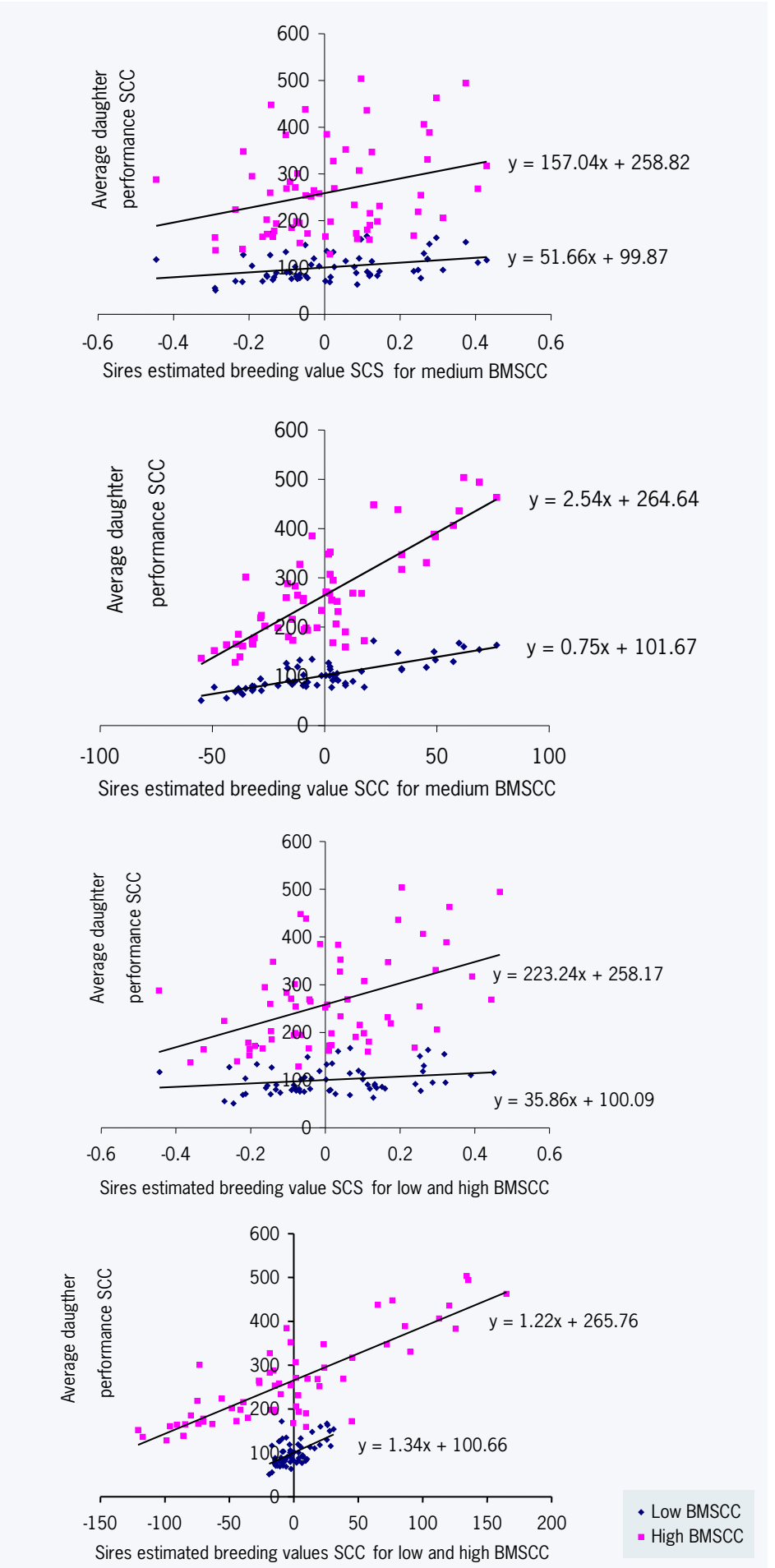
[1] SE ranged from 0.04 to 0.12
[2] SE ranged from 0.12 to 0.18

- Across BMSCC correlations were high for SCS (0.88), but low for SCC (0.54 & 0.38)
- SCS and SCC during early lactation in high BMSCC herds seem different traits than SCS and SCC during late lactation in low BMSCC herds

table 2

BMSCC	Correlation between breeding values for SCC and SCS
Low	0.77
Medium	0.58
High	0.64

- Estimated from the same data, different EBV for SCS and SCC



- Breeding values for SCS seem to under predict some of the bad bulls, especially in high BMSCC herds
- Even when GxE is taken into account in the EBV, i.e. herd specific breeding values, predictive value for SCC seems to be better

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