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Udder health indicators – which is most useful in finding cows with IMI?

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Conclusion
Cow factors were associated with the inflammatory indicators investigated, but IMI status affected SCC more than the other indicators and SCC as explanatory variable to IMI status had the best predictive mean values. Thus, the SCC still seems to be the most useful tool for finding cows with IMI.

Aim
To investigate if and how different cow factors and IMI are associated with SCC, NAGase, LDH and AP and estimate the predictabilities of these udder health indicators in identifying cows with infectious subclinical mastitis.

M&M
Twenty-five dairy herds were visited twice and quarter milk samples were taken for bacteriological culturing from 20 cows on three consecutive days in connection with the monthly test-milking. Whole udder test-day milk samples were taken according to normal routines, and analyzed for SCC, LDH, NAGase and AP. A cow was considered IMI-negative if all 12 udder quarter samples were bacteriologically negative, and IMI-positive if one or more udder quarter samples were bacteriologically positive. Associations between the dependent variables SCC, LDH, NAGase and AP, and the independent variables parity, breed, DIM, milk yield, percentage of milk-fat and milk-protein, milk-urea and IMI were investigated using linear regression models. Predictive mean values were obtained from univariable multilevel mixed logistic regression models of association between IMI status and each of the udder health indicators. Milk samples from 976 cows were analyzed, and 522 of those cows were considered IMI-negative.

Results
The results showed that all cow factors investigated were significantly associated with one or more of the inflammatory indicators, but the amount of variation explained varied much (Figure 1). Predictive mean values are presented in table 1.

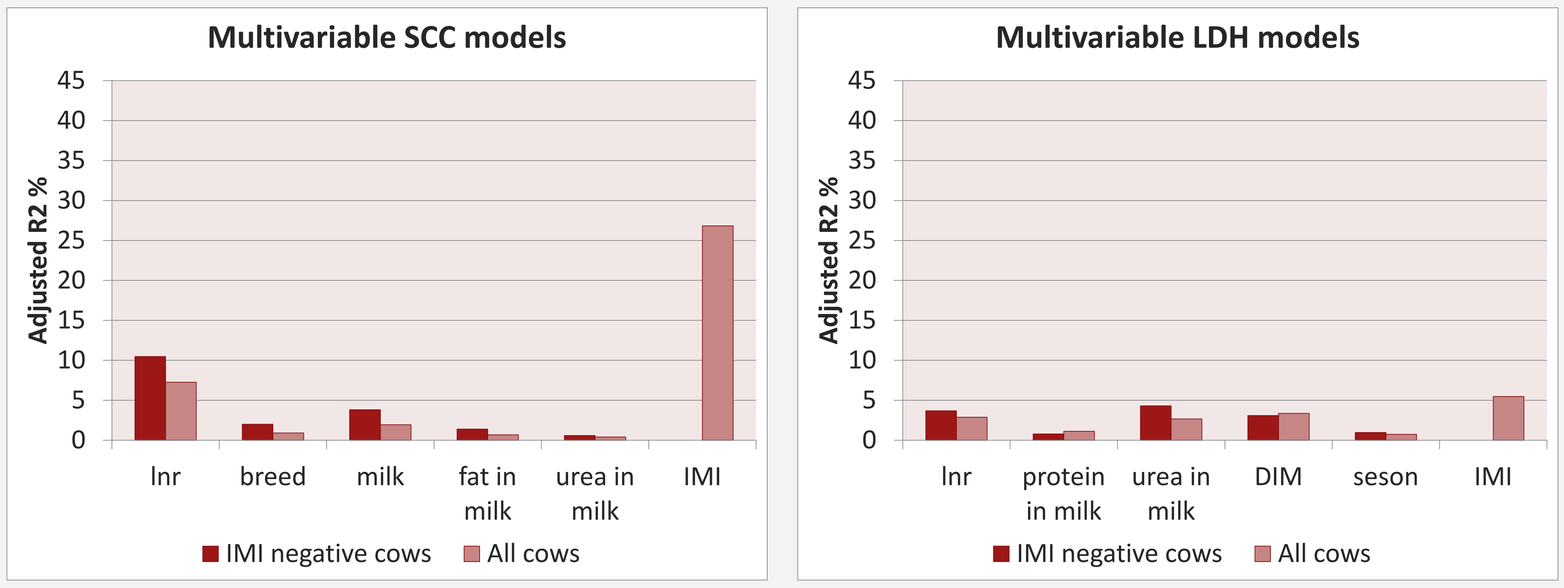

Figure 1. Adjusted R^2 values (%), showing amount of variation explained of each explanatory variable (significantly associated with the outcome), from multivariable linear regression models of associations between four udder health indicators and cow factors of IMI negative cows and multivariable linear regression models of associations between the indicators, cow factors and IMI status of all cows in the study.

Table 1. Predicted mean values from four univariable logistic regression models of association between IMI status and four different udder health indicators

	SCC	LDH	NAGase	AP
Predicted mean value for IMI negative cows	0.12	0.23	0.26	0.29
Predicted mean value for IMI positive cows	0.53	0.36	0.34	0.31

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