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QUALITY ASSESSMENT OF CALIFORNIA MASTITIS TEST AS A DIAGNOSTIC TOOL IN QUARTER SOMATIC CELL COUNT ESTIMATION

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It is shown that the CMT-scores of the other quarters in a cow can affect the judgement of the quarter of interest, and that the predictive linear regression model allows a rather reliable prediction of the effective SCC by using the CMT method. Sensitivity / specificity calculations lead to the conclusion that CMT-scoring is most reliable for extreme values of SCC which is supported by the results of the ROC curve: the only reliable CMT cutoff point of practical relevance is at "negative CMT" versus" any positive CMT-score".

MATERIALS AND METHODS

2331 quarter milk samples from 298 lactating cows were collected (1). CMT was evaluated at the moment of sampling in the barn, SCC in the laboratory with a fluoro-opto-electronic cell counter (Fossomatic^{R}). CMT-scores and corresponding SCC were compared to assess sensitivity and specificity of CMT. Diagnostic bias, intraclass correlation and a regression model were calculated, and a ROC -curve was constructed to display graphically the trade-off between sensitivity and specificity at several SCC values (3).

RESULTS

It could be shown that some *diagnostic bias* is introduced by the fact that CMT-scores of the surrounding quarters in a cow influence the (subjective) scoring of the quarter of interest significantly. *Intraclass correlation* Rho as a measure for the independence of quarter CMT-scores within a cow was found to be high (0.218). Therefore the p-values of the regression model had to be adjusted to avoid overdispersion and possible missinterpretations. *Regression results* show that CMT-scores allow a rather reliable prediction of SCC; the estimated coefficients of the linear regression model (R^2 = .57) as well as *sensitivity and specificity* of CMT-scoring at three cutoff levels for SCC were calculated:
Sensitivity increases with decreasing SCC-cutoff level: the lower SCC, the better the ability of CMT-scoring to detect these quarters correctly. On the other hand, specificity is best at a high SCC-cutoff level: quarters with high SCC are distinguished best from quarters with low SCC. As SCC is especially critical around $250x10^3$ somatic cells/ml, beeing then a good predictor of infection of the mammary gland (2), only the *ROC curve* covering this range was considered in the evaluation of the results.

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