Reducing assessment time of the Welfare Quality® protocol for dairy cattle

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The Welfare Quality® (WQ) protocols are becoming a standard for assessing welfare of farm animals in the European Union. A disadvantage of these protocols is that they are time consuming (about one day per farm) and, thus, costly. Aim of this study was to predict some of the welfare indicators in the protocol instead of measuring them all, in order to reduce assessment time of the WQ protocol for dairy cattle. Seven trained observers quantified indicators of the WQ protocol in 181 loose housed and 13 tied Dutch dairy herds (herds size: 10 to 211 cows), using six assessments methods: (1) avoidance distance (AD); (2) qualitative behaviour assessment (QBA); (3) behavioural observations (BO); (4) clinical observations (CO); (5) interview (I); and (6) resources checklist (RC). Herds were selected based on stratified sampling, using a combined health score of mortality, udder health, and milk production. Based on the data collected on-farm, herds were attributed an overall welfare classification using the WQ multicriteria evaluation model. Indicators of each assessment method were predicted using the indicators of the other five assessment methods as independent variables in linear and logistic regression models. For each assessment method, predicted and observed values were compared, and the effect of using predicted values on classification of herds was evaluated. The correlation between predicted and observed values was low for each assessment method (R^2 between 0.01 and 0.33). When using predicted values for indicators of AD, QBA, BO, CO, I, and RC, still 94, 90, 79, 88, 86, and 86% of the herds were correctly classified, leading to an estimated reduction in assessment time of 37, 25, 150, 111, 15, and 15 min for a herd of 83 cows. It was concluded that dependence between welfare indicators of the different assessment methods in the WQ protocol for dairy cattle was low. However, replacing them with predictions did not lead to many incorrectly classified herds.