The Welfare Quality® broiler welfare assessment protocol: possibilities for simplification

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The Welfare Quality® project developed a standardized welfare assessment method for broiler chickens. Stakeholders suggested that a reduction in assessment time might improve the probability of adoption in practice. The aim of the project was to determine whether or not there is scope for simplification of the protocol to reduce assessment time. In total 180 broiler flocks in 4 countries were assessed (134 in 2011, 46 in 2008). Additional slaughter plant visits were performed for 150 flocks. End scores were calculated for all flocks according to the full WQ assessment protocol. Potential strategies for simplification were analysed using (a) prediction calculations of criterion scores for each simplification strategy from prevalence for individual measures, (b) comparison of the gold standard (full protocol) with simplification strategies at final flock score level, and (c) at principal and criteria level. Analysis of correlations between animal-based measurements on-farm showed one correlation of interest with regard to further potential for simplification, this was the relationship between severe hock burn and high gait scores (r=0.615 overall; r=0.448 standard broilers; r=0.443 slower growing birds; P<0.01). High correlations were also found for slaughter plant measures and clinical scores on-farm (e.g. foot pad dermatitis r=0.732 overall; r=0.609 standard broilers; r=0.723 slower growing birds; P<0.001). Two simplification strategies were analysed further: (1) prediction of gait scores from hock burn measures on-farm; (2) replacement of on-farm measures with slaughter plant measures (predicting clinical scores and gait score on-farm from slaughter plant measurements of foot pad dermatitis and hock burn). Analysis of the possible simplifications showed close agreement for flock scores, as well as scores at both principle and criterion level. Additionally, there was a high correlation (r≥0.75) between the full assessment protocol and the simplified model at principal and criterion level. Both simplification strategies appear to have potential for reduction in performance time. Further study will be required to validate the results of the data-based simplification strategies, in flocks displaying more variation in end score categories. The current findings provide a step forward towards practical implementation of a broiler welfare assessment protocol.

Keywords: broiler welfare assessment implementation simplification
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Introduction
The Welfare Quality® project developed a standardized welfare assessment method for broiler chickens. Stakeholders suggested that a reduction in assessment time might improve the probability of adoption in practice. The aim of the project was to determine whether or not there is scope for simplification of the protocol to reduce assessment time.

Methods
180 Broiler flocks in 4 countries were assessed (134 in 2011, 46 in 2009). Additional slaughter plant visits were performed for 150 flocks. End scores were calculated for all flocks according to the full WQ assessment protocol (Welfare Quality®, 2009).

Potential strategies for simplification were analysed using:

a) Prediction of key characters (for each simplification strategy) from prevalence for individual measures,
b) Comparison of the full standard (full protocol) versus simplification strategies at flock level, and
c) At principle and criteria level.

Results
Analysis of correlations between animal-based measurements on-farm showed one correlation of interest with regard to further potential for simplification. This was the relationship between severe hock burn and high gait scores (r=0.615 overall; r=0.448 standard broilers; r=0.443 slower growing birds; P<0.01). High correlations were also found for slaughter plant measures and clinical scores on-farm (e.g. foot pad dermatitis r=0.732 overall; r=0.609 standard broilers; r=0.723 slower growing birds; P<0.001).

Two simplification strategies were analysed further: (1) prediction of gait score from hock burn measures on-farm; (2) replacement of on-farm measures with slaughter plant measures (predicting clinical scores and gait score on-farm from slaughter plant measurements of foot pad dermatitis and hock burn). Analysis of the possible simplifications showed close agreement for flock scores, as well as scores at both principle and criterion level. Additionally, there was a high correlation (r=0.75) between the full assessment protocol and the simplified model at principle and criterion level. As an example the correlations between the golden standard and the simplified model where gait scores are predicted from hock burn on farm are shown in figure 1 and 2.

Conclusions
Both simplification strategies appear to have potential for reduction in performance time. Further study will be required to validate the results of the data-based simplification strategies, in flocks displaying more variation in end score categories. The current findings provide a step forward towards practical implementation of a broiler welfare assessment protocol.

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