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Automatic classification of measures of lying to assess the lameness of broilers

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Abstract

Leg disorders are a major cause of poor welfare in broilers. Previous studies have shown that at slaughter age at least 90% of chickens experienced some degree of gait problems and approximately 30% were seriously lame. In this study, a new and non-invasive technique was developed to automatically assess the lameness of the birds. For this purpose, video surveillance images of broilers with five different pre-defined gait scores were recorded as they walked along a test corridor. Afterwards, the image-processing algorithm was applied to detect the number of lying events (NOL) and latency to lie down (LTL) of broiler chickens. Then, the results of the algorithm were compared with visually assessed manual labelling data (reference method) and the relation between these measures and lameness was investigated. Eighty-three percent of NOL were correctly classified by the automatic monitoring system when compared to manual labelling using a data set collected from 250 broiler chickens. The results also showed a positive significant correlation between NOL and gait score and a significant negative correlation between LTL and gait-score level of broilers. Since strong correlations were found, on the one hand, between two measures and gait-score level of broiler chickens and, on the other, between the results of algorithm and manual labelling, the results suggest this automatic monitoring system may have the potential to be used as a tool for assessing lameness of broiler chickens.

Keywords: animal welfare, automatic monitoring, broiler chickens, gait score, lameness, latency to lie