

Title: Automated phenotyping of health, welfare and performance traits in broilers

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Abstract: Health and welfare traits are of great importance in broiler breeding programs. However, the individual records that are required for adequate selection, such as gait score or walking ability, are often collected manually and there is a need for automated approaches. In earlier work, radio frequency identification (RFID) technology was implemented to track individual broiler locomotor activity throughout life, using RFID leg tags (<1 gram) and antennas in a grid underneath the pen. This setup was successfully validated for recording relative activity, and results indicated that broilers with reduced walking ability walk shorter distances in a day. Earlier work has also successfully implemented computer vision (CV) approaches to characterize walking in broilers, through pose estimation. However, up to now, both approaches have only been implemented in small groups. In the current project, similar RFID and CV technologies will be implemented, to automatically and continuously record locomotor activity and leg health in groups of 200-500 birds. A larger pen (~40 m²) will be fitted with RFID antennas and top-view cameras to record birds' positions and movements, and with side-view cameras for key point detection for walking characterization. Using the collected data, it will be investigated how the poses correlate with manual gait scores as gold standard. Preliminary results indicate that, among other things, step height is linked to manual gait scores. Furthermore, it will be studied when gait problems arise, how these are linked to activity levels and whether we can predict the onset of gait problems, allowing for early intervention. Overall, the results of this project will aid in objective phenotypic scoring of broilers throughout life.