



**Animal Welfare Indicators Project
2nd Annual Conference
Vitoria-Gasteiz, Spain
May 13th to 16th 2013**



On-farm broiler welfare assessment; Individual versus transect sampling

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Current European animal welfare legislation for meat chickens requires standard science-based protocols to assess on-farm welfare. Animal sampling approach has been widely used, but it implies stressful and time demanding catching and handling the birds. A novel transect approach for welfare assessment has advantages as does not require animal handling and is less time consuming. Our objective was to compare both methods based on validated welfare indicators for broilers. We assessed six identically managed commercial houses in Northern Spain, with flock size ranging from 13,220 to 27,540. For sampling we collected measures on 25 birds, at five locations within the house, by gentle pushing them to portable pen. Measures included: body weight, breast dirtiness, hock and footpad dermatitis, lameness and immobility. Transect observations were conducted by slow walking on randomized paths within each house and recording in a tablet birds showing: immobility, lameness, back dirtiness, sickness, agony and dead. Both methods differed in results, with higher levels of immobility ($4\% \pm 2.3$ vs. $0.2\% \pm 0.02$) and lameness, ($24.2\% \pm 4.7$ vs. $0.8\% \pm 0.07$) for samplings than for transect observations. Breast dirtiness accounted for $17.8\% \pm 4.9$ in sampling, while back dirtiness in transects was $0.2\% \pm 0.05$. We found $35.4\% \pm 4$ of birds with advanced footpad dermatitis and $3.6\% \pm 1.5$ with severe hock burns. In transects sick, agonizing and dead birds accounted for $0.2 \pm 0.04\%$ of the population. Variable reduction procedure (PCA) revealed lameness and immobility with agony loaded on first component in transect-specific, and breast dirtiness on the second component in sampling-specific analysis, explaining 42.4% and 26.7% of variation. Hock burns with footpad dermatitis created strongest component (30.7% of variation) from sampling indicators indicating the need for complimentary slaughterhouse checks for transects. Major discrepancies among two assessment methods may be due to a possible biased sampling of less mobile birds being more likely caught. In addition, the handling procedure may produce fatigue and fear reactions making the birds less likely to move for gait evaluation. It is likely that transect methodology needs further adjustments and refinement to assure that lameness is not overlooked. Current study provided new insights into constraints and advantages of broiler on-farm evaluation.