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Monitoring liveweight in Sarda dairy sheep using a walk-over-weighing system

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Live weight (**LW**) monitoring is important in livestock management to check nutritional, reproduction and welfare status of animals. In dairy sheep system LW measurement is less frequent because it is time and labour consuming. The use of automated weighing system could facilitate this practice. Within the H2020 Techcare project, aiming to use innovative technologies to improve welfare management for small ruminant systems, a short-test was run to evaluate the precision and accuracy of LW measures carried out using an automated walk-over-weighing (**WoW**) scale in comparison with a static scale. Thirty-six dry Sarda dairy ewes (LW, mean ± SE 55.49±0.92) were used in a 3-day session. Ewes were daily weighed 3 times following the same circuit, which included a first static LW measurement; once a static position was achieved and LW recorded, the animals continued and traversed the WoW scale for the WoW LW recording. The ewes were previously accustomed to the circuit during a pre-experimental week. Raw static and automatic LW data were first filtered for removing misbehaviours and outlier with Kalman filter algorithm. The concordance correlation coefficient (CCC) has been then calculated (Model Evaluation System) to simultaneously account for precision and accuracy. The two component of CCC (=0.98), correlation coefficient estimate (r, that measure precision) and the bias correction factor (Cb, that indicates the accuracy) were respectively 0.98 and 0.99 indicating high agreement between measures. The WoW system evaluated here is an alternative to the static scales conventionally used on dairy sheep farms. If sound filtration of raw data is applied, WoW could contribute to the close (daily) monitoring of individual LW without operator intervention (i.e. voluntary weighing), taking animal welfare into account (i.e. no stress related to the weighing session on static scales), and potentially detecting nutrition issues highlighted by LW changes.

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