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Development of an effective sampling strategy for infrared-temperature of cows' body parts

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Statement of the Problem: Infra-Red Temperature (IRT) of the external body parts of cattle is being used in contemporary research as a non-invasive, remote, practical and proxy of core body and or peripheral temperature to improve animal health, production and welfare. However, there is no research on on-farm cattle to justify effective sampling strategy of IRT through robust comparisons of maximum, average and minimum IRT of each and all relevant body parts due to a different number of replicates of thermogram in a given day, number of days and cows of evaluation. The purpose of this study is to determine any effect of them on the measurement of cow's heads and forelimbs IRT during milking in the well-shaded rapid exit herringbone parlour.

Methodology: Thermograms of 31 cow heads and forelimbs were captured during afternoon milking in the parlour for 6 days, four replication of each thermogram in a given day. Maximum, average and minimum IRT of both eyes, right eye, left eye, right ear, left ear and muzzle, were determined from the head thermograms and coronary band of right and left forelimb from the forelimb thermograms.

Findings: Histogram and Pearson correlation suggested, out of each of the eight regions of interest, IRT of both eyes was most the representative and relevant body part to measure in this context without distracting the milking process. Calculated probability suggested, IRT of ten cows for three days and four replication of thermogram in a given day are essential to evaluate, to represent all cows in a herd to improve their health, production and welfare.

Conclusion & Significance: Sampling strategy for IRT of on-farm cow body parts is proposed. It is recommended to carry out similar research considering seasonal and environmental variation.

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