



1. Animal Welfare Workshop

Title presentation

Identification of dairy cows chronic stress biomarkers

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Abstract

Stress in dairy herds can occur from multiples sources. When stress becomes chronic because of a long duration and inability of animals to adapt, it is likely to affect emotional state, health, immunity, fertility and milk production of cows. Therefore, it has a negative impact on welfare, economics and social acceptability of dairy farms. Measuring and assessing chronic stress in herds would be beneficial, however, no real consensus emerge from the literature regarding the biomarkers of interest.

The goal of this study is to compare and evaluate potential chronic stress biomarkers after inducing 4 weeks stress, with the final objective to predict the highlighted ones using milk MIR spectra. During this period, 15 cows constituting a stress group were housed under overstocking condition, with 4.6 m² per cow. Only 7 feed bunks were available to generate competition for feed access. Once weekly, an additional stress was induced by moving cows to an unfamiliar barn and diffusion of stressing noises. Meanwhile, the 15 cows of the control group stayed in the original barn, with more than 10 m² per cow and more feed bunks than cow number. On a weekly basis, following variables were recorded: general production variables, behaviour, heart rate variability, biochemical biomarkers and leucocyte profile. The results were analyzed using linear mixed models.

No differences were observed regarding milk yield, bodyweight or body condition score but the milk loss was more pronounced in the stress group. Rumination was lower and a higher number of chasing/head-butt was observed in the stress group. The heart rate was lower in the stress group and shown more heterogeneity. No differences were observed regarding salivary cortisol, blood glucose, β -endorphin, thyroxine and leucocyte profile while a higher level of hair cortisol and blood fructosamine were observed in the stress group. Among the variables highlighted, the hair cortisol content seems to be the most promising indicator to practically assess chronic stress at a large scale.