

Abstract Submission Form

Title (Mr./Mrs/Dr./Prof.)

Dr

Presenting author

Clément Grelet

Institute

Institute/company: Walloon Agricultural Research Center (CRA-W)

Address: 24 chaussée de Namur

ZIP/Postal code: 5030

City: Gembloux

Country: Belgium

Insert all authors and institutions

C. Grelet(1), H. Simon(1), J. Leblois(2), M.Jattiot(3), C. Lecomte(4), R. Reding(5), J.Wavreille(1), E.J.P. Strang(6), F.J. Auer(7), K. Goossens(8), E. Chevaux(9), HappyMoo consortium, & F. Dehareng(1)

1 Walloon Agricultural Research Center, 5030 Gembloux, Belgium

2 Walloon Breeders Association Group, 5590 Ciney, Belgium

3 Innoval, Noyal-sur-Vilaine, 35530 France

4 Eliance, Pôle données et Elevage, 75795 Paris, France

5 Convis, 9042 Ettelbruck, Luxembourg

6 LKV Baden Württemberg, 70190 Stuttgart, Germany

7 LKV-Austria, 1200 Vienna, Austria

8 ILVO, 9820 Merelbeke, Belgium

9 Lallemand Animal Nutrition, 31702 Blagnac, France

Preferred presentation

Oral

Preferred session

Session 5: SC Milk Analysis – How to relate on farm sustainability and milk analysis?

Email of corresponding author

c.grelet@cra.wallonie.be

Title of your paper

Can we get information on dairy cows chronic stress biomarkers using milk MIR spectra?

Insert ABSTRACT text

Having a possibility to regularly monitor chronic stress of dairy cows would be beneficial regarding several aspects. Indeed, when stress becomes chronic (long duration and inability of animals to cope), it is likely to affect emotional state, health, immunity, fertility and milk production of cows, hence impacting welfare, economics and social acceptability of dairy farms. In a previous step of the HappyMoo project, two molecules were highlighted as chronic stress biomarkers: hair cortisol and blood fructosamine. The aim of this study was therefore to attempt predicting these two chronic stress biomarkers using milk mid-infrared

(MIR) spectra, to enable routine monitoring. For this purpose, approximately 1400 individual dairy cows were sampled for hair, blood and milk in Belgium, Luxembourg, Germany, France and Austria in 72 commercial farms. Herds were selected locally with the objective of gathering cows with various levels of stress. Hair samples were collected at the tail switch and analyzed by ELISA for cortisol concentration, and blood samples analyzed by spectrophotometric method for serum fructosamine concentration. Milk was analysed with MIR and all generated spectra were standardized. Quantitative approach using PLS and qualitative approach using PLS-DA were used. Preliminary results show that quantitative models were not able to accurately predict the chronic stress biomarkers ($R^2_{cv} < 0.3$). However, a qualitative approach might be a possibility to discriminate stressed from non-stressed cows with percentage of good classification (accuracy) of 75% in cross-validation. Further work is needed to better exploit this dataset, however this first study suggests a possibility of using MIR milk spectra to highlight stressed cows. This might enable improvement of welfare, health and production of animals.

comment for chairmans: could probably fit in session 2 as well

Enter keywords

Welfare stress MIR