

Cheap and large scale analysis methods to quantify milk fatty acids and proteins content

F. Faucon^{1,2}, B. Huquet¹, F. Barillet³, M. Brochard¹, H. Larroque³, O. Leray⁴, I. Palhière³,
J.L. Peyraud³, P. Martin³ and M. Ferrand¹

¹*Institut de l'Elevage, France;* ²*CNIEL, France;*

³*INRA;* ⁴*Actilait*

felicie.faucon@inst-elevage.asso.fr

Fine milk composition analysis for proteins and fatty acids (FA) brings information on nutritional value of milk, animal health and herd management. Therefore, it is essential to develop cheap and easy analytical methods to characterize fine milk composition. In France, a national R&D project called *PhenoFinlait* is ongoing. The first objective of this program is to develop a cheap and large scale phenotyping system for determination of milk FA and individual proteins content.

The first year of this project has allowed the development of equations to estimate milk FA composition from MIR (Mid Infra-Red) spectra usually obtained by milk recording laboratory to determinate milk fat and protein content. First results on these equations show that 15 to 20 FA and ratios of FA could be well estimated in the milk of the three ruminant species (cow, sheep and goat). Statistical research is ongoing to improve estimation for other FA and normalize this method.

For protein separation and identification, we have chosen a liquid chromatography system coupled with mass spectrometry. We are looking for improving this method in order to be able to separate and identify genetic and isomeric variants of 12 major proteins. Analysis method is actually setting up and the database to identify these variants is almost ready.

This study receives financial support from ANR, Apis-Gène, CNIEL, France Génétique Elevage and Ministry of Agriculture. Milk samples come from INRA experimental farm (Bourges, La Fage, Le Pin and Mirecourt) and one commercial farm.