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Does standardization of ewe milk MIR spectra require specific set of coefficients?

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MIR spectra of individual milk are more and more used to generate new phenotypes about fine milk quality, status of individual animals or technological properties of milk. However, it is necessary to harmonize the spectra from different instruments into a common basis in order to merge spectra into a common dataset, to create common models and to be able to use those common models on different instruments. Such spectral standardization has been developed for cow milk in the frame of the Optimir project. The method is based on the common analysis of standard samples constituted of raw cow milks, to be used to match secondary instruments into a reference instrument. If the use MIR spectra has been mainly developed on the basis of cow milk, actors of ewe milk supply chain are expecting to use this technology to characterize ewe milk. This is the objective of MIROL project, carried by the French National Committee for Dairy Sheep (CNBL). The aim of this work was to test whether this standardization method developed on cow milk could be suitable to standardize individual ewe milk. To answer this question, 2 sets of standard milks were analysed on 6 FT-MIR instruments (1 reference instrument and 5 secondary instruments). The first one was constituted of individual cow milk samples and the second one of individual ewe milk samples. Standardization coefficients have been calculated to match spectra from secondary instruments into spectra from the reference instrument on the basis of those two sets of milks. The following month, a second set of ewe milk samples was analysed on all the previous instruments. Both cow standardization coefficients and ewe standardization coefficients were used to standardize the spectra of this second ewe milk set. Both sets of coefficients were evaluated on their ability to match the secondary instruments into the reference instrument. The differences (RMSE, Root Mean Square Error) between fat predictions obtained on the reference instrument and fat predictions obtained on the secondary instruments after standardization of the spectra using both sets of coefficients have been calculated. During the calculation of standardization coefficients, no difference was observed between the ability of both sets of milks to generate standardization coefficients. In the validation step, no significant difference was observed between ewe milk spectra standardized using cow set of coefficients or ewe set of coefficients ($p=0.859$). Calculated RMSE between the fat predictions from the reference instrument and from secondary instruments ranged from 0.01 to 0.08 when standardized with ewe set of coefficients and from 0.01 to 0.11 when standardized with cow set of coefficient. In conclusion this work shows that similar results have been observed using cow and ewe sets of coefficients to standardize ewe milk spectra. Consequently, it does not seem necessary to use specific ewe standard milks in order to harmonize and use MIR spectra of ewe milk.

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