

USE OF FRONT-FACE FLUORESCENCE SPECTROSCOPY TO DIFFERENTIATE SHEEP MILKS FROM DIFFERENT GENOTYPES AND FEEDING SYSTEMS

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The objective of the present study was to assess the potential of front-face fluorescence spectroscopy coupled with chemometric tools for the evaluation of the quality of milk samples according to the feeding system and genotype. Fifty (n = 50) ewe's milk samples were scanned after excitation set at 250, 290, 322, and 380 nm and emission set at 410 nm. Thirty out of the 50 samples composed the first trial and were obtained from two different genotypes (i.e., Comisana versus Sicilo-Sarde); the second trial was composed of 20 samples obtained from the Sicilo-Sarde genotype with two different feeding systems in pen (soybean versus scotch bean). Milk samples were divided into four groups named Sicilo-Sarde with pasture feeding (Spas), Comisana with pasture feeding (Cpas), Sicilo-Sarde feeding on scotch bean (Ssco), and Sicilo-Sarde feeding on soybean (Ssoy). The factorial discriminant analysis was applied to the: (i) four groups (i.e., Spas, Ssco, Ssoy, and Cpas) and (ii) three groups composed only of Sicilo-Sarde genotype (i.e., Spas, Ssco, and Ssoy). Considering the four groups, the best result was obtained with the excitation vitamin A spectra since correct classification amounting to 76% was observed. When the factorial discriminant analysis was performed with the three groups belonging to the Sicilo-Sarde genotype, the best result was obtained again with vitamin A spectra (i.e., emission and excitation spectra) since 88.6% of correct classification was observed. Concatenation technique applied to the five fluorescence spectra improved the rate of classification between the four groups since 44 out of 50 samples were correctly classified. No misclassification was observed between milk samples collected from ewes with pasture feeding from the pen feeding. It was concluded from the obtained results that fluorescence spectroscopy could be considered as a powerful tool for differentiating between raw milks according to both genotype and feeding system.

Keywords: Ewe's milk, Feeding, Genotype, Fluorescence, Chemometric.