NIRS ANALYSIS OF MOLASSES AND FATS USED AT THE ANIMAL FEEDS INDUSTRY

ANA GARRIDO-VARO[1*]; MARÍA DOLORES PÉREZ-MARÍN[1]; AUGUSTO GÓMEZ-CABRERA[1]; JOSE EMILIO GUERRERO-GINEL[1]; FÉLIX DE PAZ[2] AND NATIVIDAD. DELGADO[2]

[1] *Faculty of Agriculture and Forestry Engineering. ETSIAM. University of Córdoba. Apdo. 3048. 14080 Córdoba. Spain. palgavaa@uco.es*
[2] *SAPROGAL, S.A.*

Fats and molasses are used, at the present time, in a considerable proportion as ingredients for the animal feed industry. They are mainly used as energy sources, but also they provide other characteristics of technological and nutritional interest (dust reduction, increase in palatability, etc). Both semi-liquid ingredients have numerous aspects in common from the point of view of their use in livestock feeds, as well as of their analytical control. Feed manufacturers use several criteria to evaluate the quality of fat and molasses. Furthermore, the traditional methods currently used, for their evaluation (eg. fatty acids, sugars, etc) are expensive and more sophisticated that the traditionally used for solid ingredients.

The objective of the present work is to carry out a viability study to evaluate the ability of NIRS technology for the quality control of fat and molasses. Samples of liquid molasses (n = 42) and liquid fat (n = 61), provided by a feed manufacturer, were scanned in a FOSS-NIRSystems 6500 monochromator equipped with a spinning module. The samples were analysed by folded transmission, using a sample cup of 0.1mm pathlength and gold surface reflector.

For molasses, calibration equations were developed for the prediction of moisture (SECV=1.69%; r^2=0,42), gross protein (SECV=0,14%; r^2=0,99), ashy (SECV=0,60%; r^2=0,84), NaCl (SECV=0,05%; r^2=0,99) and sugars (SECV=1,04%; r^2=0,86).

For animal fats calibrations were obtained for the prediction of moisture (SECV=0,14%, r^2=0,88), acidity index (SECV=0,83%, r^2=0,82), MIU (SECV=0,38%, r^2=0,94) and unsaponifiables (SECV=0,45%, r^2=0,87). High accuracy calibration equations were also obtained for the prediction of the fatty acid profile. The equations have r^2 values around 0.9 or highest. The results showed that NIRS technology could provide rapid and accurate results and reduce analytical costs associated to the quality control of two important feed ingredients of a well known chemical variability.