The research was conducted in 13 commercial dairy farms located in Calabria (Italy). Of the 13 herds, 8 fed TMR with hay (TMR-H) and 5 fed TMR with silage (TMR-S), all provided fresh feed once a day. In each herd, 6 TMRs were screened by the PSPS in order to determine the PSD and to compare it with the one recommended by the Penn State and Bologna Universities; furthermore, homogeneity was assessed by comparing the PSD at the midpoint of three equal segments along the face of the feed, while the level of diet selection was assessed by comparing the PSD in two timepoints (at fresh feed delivery, t0; 24 h after feed delivery, tf). Diet selection was considered tolerable if differences between t0 and tf samples were less than 3–5% for each class of particles; this threshold was set also to evaluate the homogeneity of TMR along the feed face.

None of the evaluated diet respected the recommended PSD showing an excess of the long fraction (11 TMR), of the very short fraction (7 TMR), or of both these fractions (5 TMR). Homogeneity was good except for 3 diets, but particle selection raised some concerns in 85% of the farms due to preferential consumption of the very short fraction by cows. A decrease in the proportion of this more palatable component was associated with the selective refuse of the coarser fraction which reached high levels in 6 TMR. This research shows that the proportion of the long fraction of TMR in Calabrian dairy herds is often higher than that recommended by current guidelines. This finding, together with the high incidence of cases of diet selection, seems to suggest the need for a more accentuated cut of the forage fraction to prevent the feed sorting.

## P132

## NIRs calibration model for chemical composition and digestibility of total mixed rations for Parmigiano Reggiano ration

Giovanni Buonaiuto, Francesca Ghiaccio, Damiano Cavallini, Alberto Palmonari, Ludovica Mammi, Luca Campidonico, Giorgia Canestrari, Giulio Visentin, Andrea Formigoni

*Dipartimento di Scienze Mediche Veterinarie, Alma Mater Studiorum University of Bologna, Bologna, Italy*
*Contact giovanni.buonaiuto@unibo.it*

The quantification of feed composition parameters, as well as feed digestibility, requires time-consuming and expensive laboratory reference methodologies. In the context of precision livestock feeding, fast, accurate and on-line methods to quantify at a cost-effective the composition and characteristics of total mixed ration (TMR) are desired tools. Therefore, the aim of the present study was to develop prediction models using near infrared spectroscopy (NIRS) for a plethora of TMR compositional traits and digestibility. A total of 205 TMR samples were collected in herds located in the Parmigiano Reggiano area in different experimental trials. Samples were analysed, using reference methodologies, for crude protein (CP), starch, amylase-treated ash-corrected neutral detergent fiber with addition of sodium sulfite (aNDFom), acid detergent fiber (ADF), acid detergent lignin (ADL) and ash. Moreover, the fiber undegradable fractions (uNDF) of TMR was quantified in vitro at different timepoints (24 h, 30 h, 120 h, 240 h). Spectral data in the range from 900 to 2500 nm were collected for all these samples using a TANGO FT-NIR spectrometer. Partial least squares regression was employed to calibrate NIRS prediction models through a cross-validation, but also to validate such models on a subset including a random 30% of the total observations which were excluded from the calibration set. Different mathematical pre-treatments were also applied to the spectra data in order to identify the transformation which provided the most accurate NIRS prediction model (in terms of maximised explained variance and minimised root mean square error of prediction). The coefficient of determination in external validation (R2P) was >0.80 only for starch, between 0.60 and 0.80 for CP, aNDFom, ADF and ADL, while <0.50 for ash content. The R2P for uNDF prediction models at different timepoints ranged between 0.56 (uNDF30) and uNDF240 (0.68). The residual prediction deviation (RPD) in external validation was <2 for all NIRS prediction models, with the exception of ADF model (RPD =2.20). In conclusion, NIRS can be a feasible and rapid method for the prediction of different TMR chemical components and digestibility measures, although large samples size and variability would be desired and could contribute to increase models accuracies.

## P133

## Analysis of feeding behaviour in pigs fed ad libitum in an automatic management system

Alberto Cesarani[a], Roberto Steri[b], Manolo Cappelloni[c], Emanuele Sfrisi[d], Nicolo' Pietro Paolo Macciotta[a], Gianni Battacone[a]

*[a]Dipartimento di Agraria, Università di Sassari, Sassari, Italy*
*[b]Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria, (CREA-ZA), Centro di Ricerca Zootecnia e Acquacoltura, Monterotondo, Italy*
*[c]Associazione Nazionale Allevatori Suini, (ANAS), Roma, Italy*
*[d]Bompieri Allevamenti, S.S. soc.agr, Piubega, Italy*
*Contact roberto.steri@crea.gov.it*

Feeding behavior in pigs during the fattening phase has been extensively studied under experimental conditions. However, the diffusion of automatic feeding systems, coupled with the technology of animal recognition, allows, today, to study feeding behavior also in groups of animals housed in the same box. This provides the opportunity to assess social influences and competition for access to the feed station. Our aim was to define normal