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### The application research of near infrared technology in feedstuff quality rapid analysis

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Near infrared technology is one of nondestructive, rapid and green analysis technologies, it is widely used in the feedstuff industry, and provides an efficient quality control method of raw material, intermediate and finished product for factories, bringing with huge economical benefits. A novel domestic analyzer based on near infrared reflectance spectroscopy was used to determinate contents of the moisture, protein, methionine and lysine in the fishmeal and soybean meal. All the corresponding models were built. Take soybean meal as an example, the protein model of soybean meal built in Sanwei in ShanDong Province was used to predict 90 samples scanned by three same pattern instruments from different users who are Yulin in ShanDong, Haida in GuangXi and Zhongfang group, the results exist system bias, That is because the analyzer is made from several key components, such as spectrometer, sensor and light source. The same components are not entirely consistent, which will cause the differences in spectral response. These spectral differences will influence model transfer between analyzers. Experiment results prove that BS (bias/slope, which slope=1) calibration method can eliminate system bias for model transfer, shown as Table 1. The results show

that the prediction ability of model calibrated by BS method in three sub analyzers is equivalent to the master model. The BS method is an effective and simple way for model transfer and model resources share.

Table1 The results of protein model of soybean meal prediction and the bias

Users	Correlation Coefficient	Standard Deviation SEP *	Bias Value
Sanwei	0.98	0.25 **	0.04
Yulin	0.92	0.27	0.49
Haida	0.97	0.34	2.92
Zhongfang	0.96	0.39	-0.12

Notes : \* Means it is calculated according to the formula in national standard GB/T 24895-2010 ;

\*\* Means the value is SECV in 8-fold cross validation.

**Keywords** near infrared analyzer; feedstuff analysis; quality control; model transfer; BS metho