USING CALIBRATIONS DEVELOPED FOR FINE-GROUND MEAT AND BONE MEAL SAMPLES ON SPECTRA RECORDED FROM NON-MILLED SAMPLES

M.J. De la Haba[2], A. Garrido-Varo[1*], N. Núñez[2], D.C. Pérez-Marín[1] and J.E. Guerrero[1]

1. Dpto. Producción Animal, ETSIAM, Universidad de Córdoba. Apdo.14071. Córdoba (SPAIN). e-mail: pa1gavaa@uco.es
2. NIRSoluciones, S.L. http://www.nirsoluciones.com

INTRODUCTION AND MAIN GOAL

- The rendering and animal feed industries are doing great efforts to implement NIRS quality controls systems to ensure a better traceability of theirs products.
- Many industries have already implemented NIRS for fine milling products using standard cups. They have inverted time and money for developing robust calibrations for many years.
- To avoid milling, and at the same time, to increase sampling by using largest optical windows it is now possible and very much desirable

To evaluate the ability to use calibrations developed using fine milled samples to predict crude protein and ash percentages in processed animal proteins (PAP) analysed in their intact form.

MATERIALS AND METHODS

STANDARDIZATION AND VALIDATION SETS (N=21)

Samples analysed in ground form (1/4 cup) and in intact form (natural cup) and in the same instrument.

STD 1: The closest sample to the centre of the standardisation set.

STD 2: The mean spectrum of 10 spectrally selected samples from the standardization set.

Validation set: The remaining 10 samples.

INSTRUMENT

Foss NIRSystems 6500, equipped with a transport module.

CALIBRATION STATISTICS for the equations to be transferred (N=316):

r^2=0.96, SECV=1.31, RPD=5.05 for CP and
r^2=0.94, SECV=0.91, RPD=4.08 for Ashes.

CLONING ALGORITHM proposed by Shenk and Westerhaus (1989).

RESULTS AND CONCLUSIONS

Validation statistics (laboratory *versus* predicted) for crude protein and ash content predictions before and after standardisation

		% Crude Protein						% Ash							
		Mean	SD	SEP	SEP(c)	Bias	r^2	Mean	SD	SEP	SEP(c)	Bias	r^2	GH	NH
Master		61.46	2.89	1.28	1.34	0.13	0.81	17.09	2.10	1.11	1.01	-0.57*	0.87	**1.07**	**0.35**
Satellite before standardisation		60.59	2.86	1.42	1.05	1.01*	0.88	16.39	2.47	0.88	0.92	0.13	0.88	1.72	0.84*
Satellite after standardisation	STD1	62.10	2.54	1.20	1.15	-0.50	0.87	16.72	2.33	0.88	0.90	-0.20	0.88	1.14	0.52
	STD2	61.00	2.60	1.20	1.10	0.60	0.88	16.77	2.30	0.90	0.91	-0.25	0.88	**1.18**	**0.49**

- **Many studies confirm the viability of *"NIRS instrument cloning"*. The results presented here demonstrate that *"NIRS analysis mode cloning"*, it is also possible.**
- **This study suggests that NIRS networks already using calibrations for milling products may be up-graded and or enlarged with instruments analysing non-milled products.**