



EVALUATION ON SHEEP OF THE INRA-SYSTALI MODEL OF DIGESTIVE INTERACTIONS

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OBJECTIVES Renewing feeding systems to better predict animal responses to diets requires a more precise representation of digestive interactions. An aggregated model of digestion, mainly developed from data in cattle, has been developed under the INRA "Systali" project (Sauvant et al., EAAP 2013). It accounts for the effects of feeding level (FL), proportion of concentrate (PCO) and rumen protein balance (RPB), on digestive processes, and allows predictions of the main digestive events involved in the renewed calculation of feed units. We aimed to evaluate the direct application of this model on sheep .

METHODS

- Database with total tract and ruminal digestion measurements in sheep, encoded according to experimental factors (Ovidig, 110 pub., 510 trts; FL = 2,4 ± 0,9 g DM / 100 g BW; PCO = 0,40 ± 0,30; CP = 130 ± 39 g/kg DM).
- Characterization of treatments with INRA feed tables, for prediction of OM digestibility (OMd), OM true digestion in the rumen (OMtDR), rumen protein balance (RPB), microbial and total non-NH3 N at duodenum, using "Systool" (Chapoutot et al., EAAP 2013).
- Comparison between predicted and observed values according to FL, PCO, and RPB, taking into account within- and between-experiment variations.

RESULTS Figure 1. Within-experiment relationships between predicted (Systali model) and observed values.

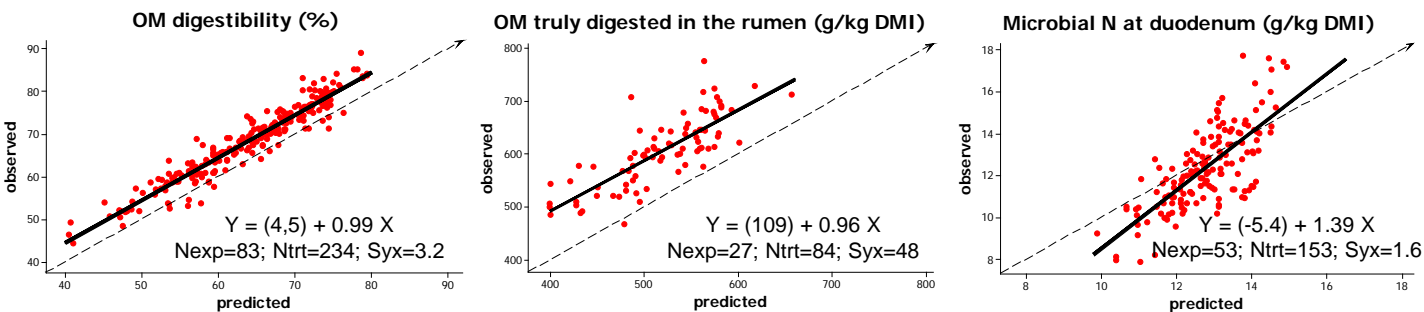
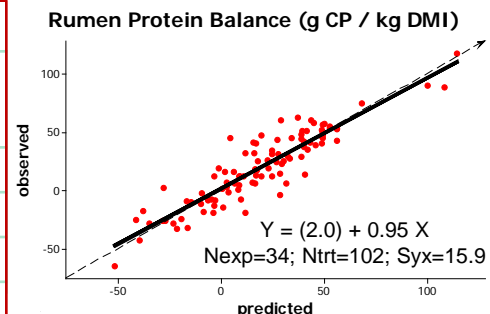


Table 1. Observed and predicted mean (SD) values.

	N trt	Observed	Predicted with interaction (Systali)	Predicted without interaction (INRA 2007)
OMD (%)	234	69.2 (9.5)	64.2 (8.4)	69.4 (9.2)
OMtDR (g/kg DM)	84	606 (87)	519 (55)	568 (72)
Microbial N (g/kg DM)	153	12.4 (3.8)	12.8 (1.0)	12.2 (2.4)
Non NH3 N (g/kg DM)	85	21.2 (3.9)	22.6 (2.8)	22.4 (4.4)



- **OMd and OMtDR** : underestimated ; difference « observed - predicted » positively related to PCO
- **Duodenal microbial and total non-NH3 N and Rumen Protein Balance** : mean prediction comparable to INRA 2007
- **Within-experiment variations** : better predicted for all parameters (slopes not ` 1).

CONCLUSION The Systali model gives a satisfactory prediction of within-experiment variations of the main digestive events involved in protein and energy valorization of diets. The influence of concentrate on digestive interactions needs to be slightly attenuated for its application on sheep.

