The interpretation of the degradation kinetics of compound feeds and hay. P Susmel, P Spanghero, CR Mills (*Department of Animal Production Science, via S Mauro, 2, Pagnacco, Udine, Italy)*

The aim of the experiment was to interpret rumen degradability data including or excluding washing losses (WL) as 'zero time' with 2 models. Samples of compound feeds containing 60% cereals, 30% beet pulp, molasses, minerals and 0 or 2% urea (U0 and U2, respectively) and a hay (H) were incubated in the rumen of 4 Simmental cows receiving the same basal diet (75:25 hay/concentrate, intake 10 gkg^{-1} LW). Bags (10 x 16 cm, 40-μm pore Ø) contained 2.1 ± 0.1 g of air-dried sample and were incubated for 2, 6, 10, 24 and 48 h (and 72 h for hay) and then washed in the cold rinse cycle of a washing machine; WL were measured by rinsing additional bags in the machine without prior rumen incubation. Bags were dried, weighed and residues analysed for N-Kjeldhal to calculate crude protein degradability *(dg)*.

The interpolations were performed with 2 models (M1 = Ørskov and McDonald, 1979; M2 = McDonald, 1981):

M1: $dg = a + b\,(1-\exp(-ct))$;
$DG = a + (bc)/(c + k)$;

M2: $dg = a + b\,(1-\exp(-ct))$;
$B = (a + b) - WL$;
$L = (1/c)\,\ln(b/B)$;
$DG = WL + (bc)/(c + k)\exp(-(c + k)L))$;

(a = soluble fraction; b = potentially degradable fraction; c = rate of degradation of b; L = lag time, k = rumen turn-over rate = 0.06/h for the concentrates and 0.03/h for the hay; DG = effective degradability).

Each model was interpolated by including or excluding the WL data as 'zero time'.

WL differed ($P < 0.01$) between feeds (60.4, 35.1 and 24.4% for U2, U0 and H respectively). On average WL was higher than both the interpolated *a* values without 'zero time' and the interpolated *a* values with 'zero time' (39.9%, 29.5% and 34.8% respectively, $p < 0.01$).

Including 'zero time' reduced the degradable fraction *b* and the rate of degradation *c* but the combination of these parameters gave similar DG values (average for the 3 feeds, 60.4 and 60.0%). The interpolation with model M2 allowed the calculation of lag phases of 3.52, 3.38 and 3.36 h respectively for U2, U0 and H, but the DG were similar to those of M1 (60.6 *vs* 59.8%).

In conclusion, for the feeds examined, the application of 2 different models and the inclusion of washing losses in the interpolation of the data led to different degradation parameters but similar calculated effective degradability. It is suggested that the simpler model be used with the WL included as the 'zero time' observation since the latter appears to be a truer representation of the actual immediately soluble *a* fraction.

Influence of pH on lipolysis and biohydrogenation of soybean oil in the rumen *in vitro*. C Van Nevel, D Demeyer* *(Department of Animal Production, University of Ghent, Proefhoevestraat, 10, 9090 Melle, Belgium)*

Diets low in roughage appear to lower lipolysis and biohydrogenation of fatty acids in the rumen. This can be due to the low pH in the rumen obtained with these diets. In this experiment, the influence of different pH values on lipolysis of soybean oil (SO) and hydrogenation of liberated fatty acids was investigated *in vitro*. Rumen contents (10 ml) were incubated (6 h) under CO_2 with Burroughs' solution (40 ml) containing 10 mg of N (NH_4HCO_3) and 40 or 80 mg of SO. Different pH values in different incubation flaks were obtained by acidification (HCl; 5 N) of contents before incubation. Changes of pH during incubation were limited (0.04–0.25) because no other substrate was added. Indeed, our preliminary results suggested that lipolysis and hydrogenation were not or only slightly affected by the presence of substrate (hay). Lipolysis and hydrogenation were determined by separation of triacylglycerols (TG) and free fatty acids by TLC and determination of fatty-acid composition by GC after methylation. Accumulation of mono- or diacylglycerols was never observed and the remaining TG were less unsaturated, indicating specificity of lipolysis for polyunsaturated fatty acids (PUFA). The mean pH values studied were: 6.8, 6.3, 5.9, 5.6, and 5.2. At pH 5.9, liberation of fatty acids was lowered, but inhibition was more pronounced in incubations with 80 mg of SO (33 *versus* 11% with 40 mg). At pH 5.2, inhibition was 52% (40 mg incubation) and 75% (80 mg), again indicating