(DM) intake (g/kg live weight (LW)^{0.75}) of hay A was 0.2 lower ($P < 0.01$) and that of hay B was 0.12 lower ($P > 0.05$) in camelids than in sheep. With the poor quality hay B, sheep were able to select a diet higher in nitrogen and lower in modified acid detergent fibre (MADF) than the food offered. The diet consumed by camelids was similar in composition to the food offered. DM digestibility of hay A was slightly greater in sheep than in camelids (0.614 v. 0.580). Conversely, with hay B DM digestibility was higher in camelids (0.533 v. 0.510) but these differences were not statistically significant. Digestibility of organic matter (OM) and MADF in hay B however, was significantly greater ($P < 0.05$) in camelids than in sheep (OM, 0.557 v. 0.527; MADF, 0.577 v. 0.511). A recording of jaw movements in two llama × guanaco at the end of the trial showed patterns of eating and ruminating similar to those expected in true ruminants. In conclusion, voluntary intake is greater in sheep than in camelids. Differences in digestibility were small, with the exception of the MADF fraction of the poor hay B which showed a higher digestibility in camelids despite lack of dietary selection in this species.

185. Effect of basal diet on sheep rumen degradability of different foodstuffs

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The objective of the current research is to evaluate the effect of basal diet on ruminal degradability using a factorial design $2 \times 3 \times 3$ defined by two basal diets, lucerne hay (H) or lucerne hay plus barley (40:60; HB), three foodstuffs — soya-bean meal (SBM), lucerne hay (LH) and barley straw (BS) — and three Churra ewes (39.5 (s.e. 0.13) kg) fitted with ruminal cannula. The level of intake was 58 g dry matter (DM) per kg live weight^{0.75} per day and the diet was offered at 09.00 and 21.00 h. Food samples were incubated in nylon bags for 2, 4, 8, 16, 32, 64 and 128 h and DM degradation parameters were determined by fitting the exponential model $y = a + b(1 - e^{-cy})$ for SBM and LH and $y = a + b(1 - e^{-c(1-t)})$ for BS. Ruminal pH and NH₃-N also were recorded at 9, 10, 12, 15, 21, 22, 24 and 3 h. DM losses of SBM, LH and BS were affected by basal diet due to a lower fractional rate of degradation (c) when animals received a HB diet ($P < 0.05$). The values of c for H and HB diets were 0.085 v. 0.055, 0.111 v. 0.068 and 0.040 v. 0.027 for SB, LH and BS, respectively. There was no significant differences in the other kinetics parameters and the values for soluble and potentially degradable fractions were 0.328 and 0.668 for SBM, 0.358 and 0.382 for LH and 0.252 and 0.453 for BS. The value of ruminal pH was lower and ruminal NH₃-N was higher when HB diet was used and both parameters varied between hours. Ruminal pH varied from 7.73 to 6.60 and from 6.82 to 6.33 for H and HB diets, respectively. However, NH₃-N varied from 22.49 to 6.56 mg/100 ml for H diet and 30.36 to 8.94 mg/100 ml for the HB diet and with both diets ruminal pH decreased and NH₃-N increased immediately in the post-meal period.

186. Purine derivatives excretion in sheep urine in relation to metabolizable energy and rumen degradable protein intake

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The objective of this work was to study the effect of different rumen degradable protein (RDP): metabolizable energy (ME) ratios in the diet on urinary excretion of purine derivatives and to achieve this objective five levels of ME: 190 (s.e. 2), 280 (s.e. 4), 350 (s.e. 4), 410 (s.e. 5) and 490 (s.e. 10) KJ/kg live weight (LW)^{0.75} per day, and five levels of RDP: 1.37 (s.e. 0.058), 1.79 (s.e. 0.029), 2.29 (s.e. 0.37), 2.84 (s.e. 0.054) and 3.41 (s.e. 0.061) g/kg LW^{0.75} per day,

were supplied to 75 Merino ewes according to a 5×5 factorial design. The formulation of the experimental diets was made combining two forages — low quality meadow hay and barley straw — with a pelleted concentrate, including tapioc meal, gluten meal, sodium caseinate, sunflower oil and mineral vitamin supplement. The variability between animals within groups in the amount of purine derivatives excreted in the urine was very high (0.242 for allantoin, 0.349 for uric acid, 0.336 for hypoxanthine, 0.957 for xanthine and 0.229 for total purine derivatives). This variability is not reduced when excretion of purine derivatives is expressed in relation to creatinine output. Total purine derivatives output (TPD) was not affected by either ME ($P > 0.10$) nor RDP ($P > 0.10$) intakes. Nevertheless, a tendency to decrease the TPD excretion was observed in the groups of animals with the two higher levels of ME intake (410 and 490 KJ/kg LW^{0.75}) when reducing RDP supply. The values of TPD varied from 88 to 58.2 and from 73.5 to 52.7 mg/kg LW^{0.75}, respectively. On the other hand, allantoin excretion explained most of the variation observed in the total output of purine derivatives ($R^2 = 0.935$).

187. Effects of sustained release boluses providing selenium and vitamin E on blood glutathione levels of cows and their calves

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Giving trace elements to cattle by a sustained-release bolus system could provide more uniform supplementation than free-access minerals. In-calf cows (June/July calving) with a history of selenium inadequacy were given on 5 February two sustained-release multi-trace element/vitamin boluses (Alltrace, Agrimin Ltd) providing 2 mg Se and 9 i.u. vitamin E per day (with Cu 138, Mn 71, Zn 113, Co 2.0, I 2.1 mg/day and vitamin A 4644 and vitamin D 929 i.u./day). The selenium concentrations in the dry matter (DM) of the foods given during housing to 12 April were variously: grass silage 0.013, hay 0.022, straw 0.009, barley 0.014, swedes 0.021, dark distillers' grains 0.100 mg Se per kg DM. The subsequent grazing (mean eight samples) contained 0.042 (s.e. 0.009) mg Se per kg DM. The mean blood glutathione levels (GSHPx units per ml red blood cells) for 22 bolused cows and nine untreated cows were respectively: 5 February, 31 (s.e. 3.2) and 24 (s.e. 4.2); 12 April, 93 (s.e. 4.9) and 30 (s.e. 5.6) ($P < 0.001$); 14 August, 70 (s.e. 4.9) and 6 (s.e. 2.3) ($P < 0.001$); and 18 October, 50 (s.e. 3.8) and 11 (s.e. 1.0) ($P < 0.001$). In a second experiment, suckler cows which had grazed herbage containing 0.03 mg Se per kg DM were housed in October and given hay, silage and pea straw (all with 0.01 mg Se per kg DM) with 1 kg concentrate (0.35 mg Se per kg DM). On 22 December (when the overall mean GSHPx level was 15 (s.e. 1.3) units) 18 cows were given two Alltrace boluses and 10 cows were untreated. By 1 February the respective mean GSHPx levels were 77 (s.e. 3.1) and 18 (s.e. 2.3) units ($P < 0.001$). The cows calved indoors from 3 to 14 weeks later. The mean calf blood GSHPx levels at birth were respectively 92 (s.e. 6.9) and 32 (s.e. 8.5). It is concluded that giving two boluses significantly increased blood GSHPx levels in cows for 8 months and of their calves at birth.

188. Overestimation of solubility by polyester bag methodology

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In polyester bag methodology solubility value forms a major proportion of extent of degradation calculations as it is assumed to