

85. Effect of supplementation level and sheep breed on hay intake and diet digestibility

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Voluntary food intake (VFI) of hay (crude protein (CP) 97.4 and neutral detergent fibre (NDF) 618.9 g/kg dry matter (DM)) and DM digestibility were studied in nine non-productive adult ewes supplemented with three levels of barley grain (105.3 g/kg CP; low (L): 0, medium (M): 400, high (H): 800 g per head per day). A Latin-square design trial (3 × 3 × 3) involving three sheep breeds and three levels of concentrate in three periods was used. The breeds compared were Merino (MER), Assaf (ASS) and Churra (CHR) using three animals of each breed. All ewes were individually penned. Hay *ad libitum* and concentrate were independently offered at 10.00 and 18.00 h. The average live weights were 55.8 (s.e. 7.6), 44.3 (s.e. 9.9) and 39.8 (s.e. 10.1) kg for ASS, CHR and MER respectively. Daily voluntary food intake (VFI) of hay was lower ($P < 0.05$) for the higher supplementation level (H: 426.85; M: 567.37; L: 668.66 (s.e. 36.89) g DM). There were no differences in VFI of hay between breeds ($P > 0.05$). There were significant ($P < 0.01$) differences in total daily DM intake (hay plus concentrate) expressed in g/kg metabolic body weight ($M^{0.75}$) among diets, so increasing the level of concentrate supplementation increased total daily DM intake (H: 63.82; M: 56.72; L: 39.04 (s.e. 2.99) g/kg $M^{0.75}$), but increased ($P < 0.001$) DM digestibility of the diet (H: 0.71; M: 0.64; L: 0.53 (s.e. 0.01)). Total daily DM intake was lower ($P < 0.01$) for the Assaf breed as compared with Merino breed, while there were no differences among Churra and the other two breeds (ASS: 45.41; MER: 59.77; CHR: 54.39 (s.e. 2.99) g/kg $M^{0.75}$). DM digestibility did not vary significantly among breeds ($P > 0.05$). In conclusion, the breed could affect the total DM intake expressed per unit of $M^{0.75}$, but did not affect VFI and digestibility, and the concentrate level clearly affected VFI of hay and DM digestibility of the diet.

86. Digestive utilization during post-weaning period in Churra lambs: effect of previous level of milk intake and protein content in the diet

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A previous study showed changes in dimensions of the digestive tract in response to pattern of nutrient supply during lamb growth. These changes could affect diet utilization. The objective of this work was to study the effect of two levels of intake (1.5 and 0.9 MJ gross energy (GE) per kg $M^{0.75}$ per day) during the milk-fed period (4 weeks) and two post-weaning concentrate supplements in the diet (HP: barley plus 200 g fish meal per kg and LP: barley) on the apparent digestibility of the post-weaning diet. A 2 × 2 factorial design, with three lambs per cell, was used to provide digestibility data. During the post-weaning period, low-quality hay and concentrate were offered *ad libitum*. After weaning (P1) the lambs were fitted with harnesses. Intake and faecal output of each lamb was measured daily during the collection period (4 days). The apparent digestibility of dry matter (DMD), organic matter (OMD) and crude protein (CPD) was calculated. This was repeated when the live weight of the lambs was 20 kg (P2). At P1, only CPD of the HP diet was higher ($P < 0.001$) than that of the LP diet (0.831 v. 0.715). At P2, higher ($P < 0.001$) DMD (0.840 v. 0.780), OMD (0.852 v. 0.770) and CPD (0.879 v. 0.666) for the HP diet were observed. The OMD (0.797 v. 0.825) and CPD (0.744 v. 0.799) was lower ($P < 0.05$) for the lambs with a high level of milk intake. There was

no significant interaction between the two factors considered. There was an effect of pre-weaning level of intake on digestive utilization after a period of adaptation to the post-weaning diet and not immediately at weaning. Undegradable protein content in the diet has a positive effect on DMD, OMD and CPD at the end of the post-weaning period considered. Consequently, both factors can help in developing strategies to optimize the use of foodstuffs by growing lambs.

87. Influence of weaning on carcass, fatty acid composition and meat quality in intensive lamb production systems

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In Mediterranean countries weaning is an important decision both in meat and milk production systems, and in previous work, using the Lacune milk breed, unweaned lambs produced meat of better eating quality. In this study, 40 lambs of the Rasa Aragonesa local meat breed, both males (M) and females (F), were divided into two feeding treatments: weaned at 35 days (W) and unweaned (UW). The slaughter weight was 22.1 kg (78.3 (s.e. 1.3) days) and feeding was, in both, *ad libitum* with access to a concentrate (180 g/kg crude protein (CP) from birth to 12 kg live weight and then 165 g/kg CP until slaughter) and cereal straw. Production, carcass quality, meat quality (instrumental and taste panel) and meat and subcutaneous fat composition (fatty acids) were studied. Live-weight gain was significantly ($P < 0.05$) different between sexes (M 244 (s.e. 6.3) v. F 210 (s.e. 6.1) g/day) but not treatments. Dressing proportion was higher in UW ($P < 0.01$). Only small differences in conformation and wholesale cuts were observed. Significant differences in fatness were found due to feeding treatment ($P < 0.01$) and sex ($P < 0.01$): kidney fat (FUW 38.2 (s.e. 3.4), MUW 27.9 (s.e. 1.5), FW 25.4 (s.e. 2.3), MW 20.0 (s.e. 1.7) g/kg) and shoulder fat trim (FUW 203.1 (s.e. 19.1), FW 187.6 (s.e. 7.3), MUW 176.7 (s.e. 5.2), MW 169.6 (s.e. 8.6) g/kg). Among the meat quality traits, W had redder meat ($P < 0.05$) judged by colour and haem pigments. No statistical differences were found in the other traits except flavour intensity ($P < 0.05$), which was higher in UW 66.8 (s.e. 0.9) than W 63.6 (s.e. 0.8), on a 1 to 100 scale. All other aspects of eating quality, in grilled *m. longissimus dorsi* slices, tended to be higher in UW. The fatty acid composition of subcutaneous and intramuscular (IF) fat depots differed (generally more unsaturated and polyunsaturated in IF, $P < 0.01$), and there were differences between W and UW (unsaturated higher, saturated lower in W, indicating softer fat). Palatability characteristics were not closely associated with fatty acid composition and could be more related to total fat content.

88. Cut-and-carry feeding of indigenous grass in Indonesian sheep production: effect of amount of grass offered and wilting on intake and yield of compost

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On small holdings in West Java, indigenous grass, cut-and-carried from roadsides, is the main food for sheep and flocks (*ca.* five head) are permanently housed on slats over composting pits. Before offering at 50 to 60 g dry matter (DM) per kg live weight (M) daily, grass may be wilted for up to 24 h in baskets or hessian sacks. During this period the grass heats up. This could reduce