

SHEEP AND GOAT NUTRITION
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Energy and protein requirements in milk-fed lambs

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In relation with the energy and protein requirements in milk-fed lambs the effect of the level of energy intake (EI), crude protein content in the diet (CP), age and sex of growing lambs upon the retention of energy (ER) and nitrogen (NR) was studied. Milk diets based on cow's milk supplemented with either calcium caseinate or glucose and fat-filled skim milk were fed to 114 lambs of the Churra breed in a 3 x 3 x 2 x 2 factorial experiment using the comparative slaughter technique. The daily EI were 0.63, 1.05 and 1.46 MJ gross energy per kg metabolic body weight (MBW, kg^{0.75}). The CP were 179, 240 and 349 g/kg dry matter. Males and females between 2 and 16 and between 16 and 30 days old were used. The live weight gain (LWG) and its energy and nitrogen concentration were significantly influenced by the four factors studied and only the nitrogen content of the LWG was independent of the sex of the lambs. The daily ER (MJ/d) and NR (g/d) were estimated from the LWG (kg/d) and the live weight (LW, kg) of the lambs according to the equations:

$$ER = -0.17 + 15.19 LWG - 16.32 LWG/LW - 279.57 (LWG/LW)^2, R=0.965, RSD=0.24$$

$$NR = 0.38 + 31.42 LWG - 72.12 LWG/LW + 559.7 (LWG/LW)^2, R=0.966, RSD=0.52$$

Since the EI and the CP influence the ER and the NR it is possible to estimate the ER (MJ/kg MBW per day) and the NR (g/kg MBW per day) from the intake of metabolizable energy (MEI, MJ/kg MBW per day) and nitrogen (NI, g/kg MBW per day) according to the equations:

$$ER = -0.28 + 0.04 NI + 0.53 MEI, R=0.938, RSD=0.07$$

$$NR = -0.35 + 0.23 NI + 0.79 MEI, R=0.896, RSD=0.11$$

Combining the four equations it is possible to calculate the optimum energy/protein relationship of the diet and the values decrease when the LWG increase and ranged from 130 to 71 and from 155 to 126 kJ ME per g CP for the lambs of 2-16 and 16-30 days old respectively.