ABSTRACT

Title of Thesis: A Comparative Study on Energy and Protein Requirement of the Native and Crossbred Lambs.

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An experiment was conducted for 32 weeks to study the performance of native and crossbred weaner lambs under two levels of energy and two levels of protein and to assess the requirement of energy and protein for growth purposes. The period from the start of the experiment up to first shearing is referred as the first period, which was approximately of two months duration. The post shearing period was divided into two periods referred as second and third periods representing 6-9 and 9-12 months of age of the lambs respectively. A total of 120 male weaner lambs of Chokla (C), Rambouillet x Chokla (R x C), Russian Merino x Chokla (M x C), Nali (N), Rambouillet x Nali (R x N) and Russian Merino x Nali (M x N) were used under four feeding regimes. The nutrition treatments consisted of Low energy low protein (LL), Low energy high protein (LH), High energy low protein (HL) and High energy high protein (HH), the TDN and DCP consumption at the low and high levels being approximately 1½ and 2 times the maintenance requirement. Haemoglobin (Hb), Haematocrit (PCV),
total plasma protein, Plasma urea nitrogen (PUN) and blood glucose concentration were measured. Production and quality of wool was also studied.

The average daily gain (ADG) of HH group was significantly higher (83g/day) and in general, remained best followed by LH treatment. R x N lambs gained the highest (84g/day) followed by M x C, R x C and M x N lambs. The crossbred lambs gained higher than the native lambs in each level of nutrition.

During the entire period the average, dry matter (DM) consumption/day varied from 705 g for LL to 779 g for HH feeding regimes respectively. The DM consumption per 100 g body weight during first, second and third period were 4.0, 3.4 and 3.4 kg respectively. A weaner lamb of about 4-6 months having approximately 12 kg body weight required about 455, 311 and 36 g of DM, TDN and DCP respectively for an average daily gain of about 35 g. A lamb 6-9 months of age, weighing about 20 kg required 617, 422 and 48 g of DM, TDN and DCP per day for an ADG of 70 g. Similarly a weaner lamb growing at the rate of 95 g per day and having a body weight of approximately 30 kg, during 9-12 months of age required 939, 631 and 62 g of DM, TDN and DCP respectively. The overall feed conversion per kg gain was 9.87 kg and 6.68 kg for DM and TDN respectively. The crossbreds required less TDN per unit gain than the natives. The digestibility coefficients for DM, EE and NFE were in general, significantly higher and
for CF was lower with high energy levels than with the low energy level. The high protein diets increased the digestibility of CP and CF in the first trial.

Hb, blood glucose and total plasma protein increased with advancing age up to 12 months, whereas PCV and PUN values first increased and then decreased slightly. The values for Hb, PCV, PUN, total plasma protein and blood glucose between periods varied from 9-10g/100 ml, 32-36%, 29-34 mg, 7.3 - 8.1 g and 36-40 mg/100 ml respectively. Low energy groups had higher Hb and lower PCV values. Low protein groups had low plasma protein and PUN levels than high protein groups. The HH group yielded significantly higher grease fleece weight (1545 g), staple length (7.03 cm), fibre diameter (37.35 u) and medullation percentage (32.46%) than the other treatment groups. Crossbreds performed better than the natives and did not differ among themselves in the quality of wool fibres.