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Lowering crude protein and supplementing rumen protected methionine and lysine in dairy ewes

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In several dairy sheep systems, crude protein (CP) overfeeding has been documented leading to lower nitrogen (N) use efficiency (NUE) and increased N excretion into the environment. This study investigated the effect of lowering the dietary CP level by supplementing rumen protected methionine (RPM; KESSENT® Me) and rumen protected lysine (RPL; LysiGEM®) at a constant ratio on milk yield and composition. A total of fifty-four (54) Lacaune ewes were involved in a randomized block design with five treatments: a basal diet with CP at 19.3%DM (CTR), a diet with lower CP at 15.1% DM (NEG), and three treatments with decreasing CP compared with CTR, supplemented with RPM and RPL at a fixed ration, namely AA1, AA2 and AA3. The AA1 treatment consisted on the NEG, supplemented with 3 g/d RPM and 5 g/d RPL, AA2 had a CP level at 16.2%DM supplemented with 3 g/d RPM and 4 g/d RPL, and AA3 had a CP level at 16.9%DM supplemented with 3 g/d RPM and 3 g/d RPL. The study lasted for 12 weeks. Each week, for two consecutive days, milk yield, composition and dry matter intake were measured. Dry matter intake was on average 3,26 kg. Lowering CP levels without adding rumen protected amino acids, reduced milk yield by 12.2% (2.36 vs 2.07 kg/d for CTR and NEG respectively; $P < 0.001$), but when NEG was supplemented with RPM and RPL milk yield differences were not significant compared with CTR. The AA3 had the highest milk yield but was not different than CTR (2.51 kg/d). However, milk fat composition was significantly higher (6.69 vs 6.25 for AA3 vs CTR, respectively) without affecting milk protein composition. When protein and fat composition were considered calculating fat and protein corrected milk yield (FPCMY), differences between AA3 and CTR became clear leading to improved FPCMY for AA3. In conclusion, lowering CP levels and supplementing rumen protected amino acids is a valid strategy to improve NUE and increase ewes' productivity.