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Dominique Francois, Frédéric F. Bouvier, Edmond Ricard, Yves Bourdillon,
Jean Louis J. L. Weisbecker, Didier Marcon

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Residual feed intake divergent selection in sheep

Francois, D.¹, Bouvier, F.², Ricard, E.¹, Bourdillon, Y.², Weisbecker, J.L.² and Marcon, D.², ¹INRA, UR 631 SAGA, BP 52627, 31326 Castanet Tolosan, France, ²INRA, UE 332 Domaine de Bourges, la Sapinière, 18390 Osmoy, France; Dominique.Francois@toulouse.inra.fr



Meat sheep selection programmes concern meat traits such as growth and body composition. One way to improve lamb production may be to increase the efficiency of feed transformation by lambs. Measurement of feed intake in sheep has been performed with automatic feeders on young rams as they are submitted to individual test for selection on liveweight (LW), growth and body composition. The test is following a national scheme process and lasts 8 weeks from about 100 to 156 days of age. LW and ultrasound scan (US) are recorded at start (LW only), mid (both LW and US) and end (both LW and US) of the test. Feeders provided detailed data for every meal of the ram (identity, intake, duration) allowing computation of daily feed intake (DFI). Since DFI is strongly correlated with LW, growth and body composition; linear regression of DFI on these traits was performed and residual feed intake (RFI) was expressed as the residue of the regression. A demonstrating one-generation divergent selection was carried on. Sires have been selected among a trial of 151 Romane (INRA-401) rams. The 10 more favorable (FA) with the most negative residual feed intake rams and 10 less favorable (LF) with the most positive residual feed intake ones were selected. 7 of each group were mated to Romane ewes and procreated the next generation. FA sires had a RFI mean of -211 g/day, as LF sires had + 204 g/day. The selection differential was 415 g (=3.7 residual standard deviation). Among the offspring, 160 males entered the individual test protocol, 149 achieved it, 82 from FA sires and 67 from LF sires. They were measured at the same age following the same protocol as the sires. On average the RFI was -21 g/day for FA offspring as + 26 g/day for LF offspring, differential was 47 g/day. Realized heritability was 0.23. Correlated responses on DFI, LW, growth and body composition will be presented.

Effect of mixing grass silage with concentrate on feed intake in ewes and live weight gain in lambs

Helander, C.¹, Nadeau, E.¹, Nørgaard, P.² and Arnesson, A.¹, ¹Swedish University of Agricultural Sciences, Department of Animal Environment and Health, P.O. Box 234, 532 23 Skara, Sweden, ²University of Copenhagen, Faculty of Life Sciences, Department of Basic Animal and Veterinary Sciences, Grønnegårdsvej 3, 1870 Fredriksberg C, Denmark; Carl.Helander@slu.se

The aim was to study the effects of chopping grass silage and of mixing grass silage with concentrate on intake, body weight (BW) and body condition score (BCS) in pregnant and lactating ewes and on LWG of lambs until weaning. Two similar experiments (Exp. 1 and Exp. 2) were carried out over two consecutive years. Each year, 21 ewes were allocated equally to three treatments; unchopped silage *ad libitum* and 0.8 kg concentrate daily, fed separately (US), chopped silage *ad libitum* and 0.8 kg concentrate daily, fed separately (CS) and chopped silage and concentrate in a mixed ration *ad libitum* (CM) with the same forage to concentrate ratio as in CS. The silages in Exp. 1 and Exp. 2 contained 10.9 and 11.4 MJ metabolisable energy /kg DM and 580 and 483 g NDF /kg DM, respectively. The ewes increased their silage DM intakes from late pregnancy to lactation by 47 and 64%, in Exp. 1 and Exp. 2, respectively, when averaged over treatments (P<0.001). In Exp. 2, the daily DM intake of lactating ewes was, on average, 13% higher for CM than for US and CS, which did not differ (4.75 vs. 4.21% of BW, P<0.05). Neither BW nor BCS of ewes were affected by chopping silage or by mixing silage and concentrate. The ewe BW was 97.8 and 97.3 kg in pregnancy and 87.2 and 91.7 kg in lactation in Exp. 1 and Exp. 2, respectively, when averaged over treatments (P<0,001). The ewe BCS was 3.1 and 3.4 kg in pregnancy and 2.7 and 3.0 kg in lactation in Exp. 1 and Exp. 2, respectively, when averaged over treatments (P<0.001). In Exp. 2, CM increased daily LWG from birth to weaning by, on average, 16% compared to US and CS, respectively (454 vs. 392 g, P<0.01). Mixing silage and concentrate increased DM intake in lactating ewes and LWG of lambs from birth to weaning.

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