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Effect of an alternative rearing method on milk production and lamb weight gain

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Removing lambs from their mothers at early stages of lactation for small periods during the day may increase milk yields, because ewes have time to recover. Therefore, we tested if an alternative rearing methods affects milk production of ewes and weight gain of lambs. Forty primiparous Lacaune ewes were used. For the first 2 weeks after lambing, they were milked once a day and were kept with their lambs all day. Thereafter, ewes were allocated into 2 groups (control C and test T; n=20 in each), balanced for lambing date and prolificacy. Housing and feeding management were the same for both groups and the trial lasted 2 weeks. In group C, lambs were constantly kept with their mothers. In group T, lambs were separated for 12 h during the night and reunited again after the morning milking. Lambs had *ad libitum* access to feed and water. Ewes in both groups were milked once a day and milk yield (MY) was recorded using volumetric milk meters. All lambs were weighed at the start of the trial and weekly to calculate average daily gain (ADG). Mean daily MY and total MY for ewes and ADGs for lambs were log-transformed to achieve normality. Comparisons between C and T groups were done with t-test for equal variances or Mann-Whitney test for unequal variances. T ewes had higher daily MY(±SD) (0.87±0.35 vs 0.54±0.35 l, P=0.001) and produced 61% more milk (15.62±6.38 vs 9.71±7.40 l, P=0.001) than C ewes during the trial period. Moreover, mean(±SD) weight at the start of the trial was 7.36 kg(±1.4) and 8.02 kg(±1.4) for C and T lambs, respectively. C group lambs had higher ADG compared to T (295.7±102.5 vs 214.6±89.0 g, P<0.05) during the first week. ADG during the second week and in total were not significantly different between lambs of C and T groups, although C lambs grew faster (by 25.4%). than T lambs. Therefore, alternative lamb rearing produces a trade off between ewe milk production and lamb growth as well as higher feed and labour costs. However, when the main source of farmer's income is milk, alternative lamb rearing may be a preferable option to optimize saleable milk production instead of producing light lamb carcasses.

Regulation of anti-mullerian hormone (AMH) by oocyte specific growth factors in ovine granulosa cell

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Oocyte secreted factors, belonging to the transforming growth factors-β (TGF-β) superfamily regulate ovarian function via paracrine and/or autocrine action, but regulation of AMH production is yet poorly understood. The aim of the present study was to investigate the role of oocyte derived factors GDF9 and BMP15 on AMH and estradiol production from ovine granulosa cells, *in vitro*. Granulosa cells were harvested from small (1-3 mm diameter) and large (>3 mm diameter) follicles from ovine ovaries and cultured in serum free conditions for 48 hours with or without GDF9 and BMP15 in the presence or absence of FSH. Concentration of 17β-estradiol and AMH in culture medium were determined by RIA and ELISA methods, respectively. Statistical analysis was performed by one way Anova, followed by LSD test, using Statgraphics program. The results showed that addition of GDF9 significantly (P<0.05) decreased the production of AMH from small follicles, whereas BMP15 had no effect. In large follicles, GDF9 also caused a decrease in AMH concentration, without reaching significance. Estradiol production from granulosa cells from both small and large follicles was also found to be significantly (P<0.05) decreased by GDF9 alone or in combination with FSH, compared to control. In conclusion, these findings show for the first time that the oocyte-secreted factor GDF9 reduces the production of AMH, thus suggesting an attenuation of its inhibitory action on the progression of small follicles in ewes.

Prepartum grazing with oat pasture and its effect on mother-lamb behaviour at parturition

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Nutrition during gestation has an important role at time of parturition for both mother and offspring. The effect of different nutritional management during the last month of pregnancy on body condition (BCS), body weight (BW) and mother-lamb behaviour at parturition was evaluated. One hundred and forty multiparous Corriedale ewes gestating a single lamb were offered native pasture (7% crude protein (CP)) during the first four months of gestation and were assigned to two differential nutritional management during the last month of pregnancy: (1) ewes grazing oat pasture (14% CP) (GO, n=71); (2) ewes fed native pasture (GNP, n=69), regarding BW and BCS at the beginning of the treatment (49.1±0.7 vs 49.7±0.7 kg and 3.74±0.05 vs 3.77±0.05 GO and GNP respectively). At parturition BW and BCS were registered, as well as duration of labour, delivery assistance and Maternal Behaviour Score (MBS, range 1-5). In lambs, birth weight, Apgar test for newborns (score 0-10), and time elapsed to stand and suck was recorded. Data were analysed using PROC MIXED and GENMOD of SAS, (mean ± SEM; P≤0.05). At parturition GO ewes had higher BW (56.7±0.8 vs 52.7±0.7 kg P<0.0001) and BCS (3.7±0.04 vs 3.4±0.06 P=0.0007) than GNP. Duration of labour was longer (32.5±4.7 vs 24.03 min, p<0.001) and percentage of delivery assistance was significant greater (22.5 vs 4.3%) in GO group. Lambs from GO mothers were heavier (4.77±0.07 vs 4.28±0.09 kg, P=0.0037), and took longer to stand (36.4±4.2 vs 28.5±3.9 min, p<0.001) and suck (56.4±5.2 vs 51.5±4.9 min, P=0.0011) than GNP lambs. There was no effect on MBS or Apgar test. The increment in BW and BCS of GO animals resulted in heavier lambs, that led to longer time of labor and less vigor compared with lambs of GNP ewes. Higher percentage of birth assistance in GO ewes suggests that the benefit of a greater weight at birth can be exploited only if control of parturition is performed. However, grazing oat pasture should be an alternative to be used with twin bearing ewes since lambs are usually lighter and have less vigor than single ones.

Infra-red thermography as a monitoring tool for detection of sub clinical mastitis in dairy ewes

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Infra-red thermography (IRT) is a no contact measurement technique of superficial temperatures (ST). It is used as a diagnostic or screening tool. In this study, sterile milk samples were taken from 236 clinically healthy milking ewes, one sample for each half-udder. They were analysed both for SCC as well as for bacteriological positivity. Sub-clinical mastitis was defined as: >500,000 SCC, and bacteriological test (+). Based on these results, animals with doubtful or incomplete data were ruled out, and the rest were divided into 3 groups: *A: both half-udders (-),102 ewes. B: one half-udder (-) one half-udder (+), 50 ewes. C: Both half-udders (+), 30 ewes*. IRT evaluation was done before sampling using a FLIR IR- vet, 420 esc. camera. The evaluation included 4 measurement areas; right and left half-udders with lower and upper area for each. Irrespective of the individuals, positive half-udders showed a significant difference of ST in the lower area compared to negative ones (P<0.02). However, it was not possible to define a temperature clearly indicative of a suspected subclinical mastitis. Nevertheless, comparing the delta temperature expressed in absolute value between the half udders in the same ewe showed a highly significant difference (P<0.0001) between the 3 groups. The ewes were then divided into 2 groups by placing a delta temperature *cut-off* (0.5 °C) in the lower mammary area. The results were as follows; 110 ewes resulted as 'mastitis unsuspected', 87 were correctly identified (based on the gold standard of bacteriological positivity) and 23 were false negatives. A further 72 ewes resulted as subclinical mastitis suspects (delta temp>0.5 °C), with 15 false positives and 57 correctly identified cases. Hence, adopting delta temperature as a criterion for animals suspected as having subclinical mastitis in at least one half udder showed a sensitivity equal to 71% (57/80), a specificity of 85.3% (87/102) and an accuracy of 79% ((57 + 87) / 182), while setting a cut-off at 0.5 °C.