

**Relationship of bodyweight and BCS with backfat and longissimus dorsi thickness in four dairy sheep**

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The objective of this study was to use the ultrasound measurements of backfat thickness (BFT) and longissimus dorsi depth (LDD) to evaluate body condition score (BCS) and bodyweight (BW) changes in four different dairy breeds of sheep. Thirty randomly selected and clinically healthy non-pregnant, non-lactating ewes (Chios, n=8; Frizarta, n=8; Lacaune, n=7 and Assaf, n=7) were used. The experimental treatment involved a 6-weeks period of over-feeding and a 4-weeks period of under-feeding, considering the nutrient requirements for ewe's maintenance. BCS (scale 1-5; increments of ¼ units) was assessed by palpation. BW of individual ewes was measured weekly; the same time BFT and LDD were assessed with ultrasound (5.0 MHz linear transducer) at the transversal processes of the 3<sup>rd</sup>-4<sup>th</sup> lumbar vertebrae. BFT and LDD values and BCS values were analysed with repeated measures mixed models (IBM SPSS v.25). Breed, treatment and their interaction (B×T) were set as fixed effects and ewe was used as random effect. The most appropriate covariance structure was selected. Additionally, pairwise correlations between BW, BCS, BFT and LDD were calculated within each breed. BFT and LDD were strong predictors of BCS (BFT:  $\beta=0.255$ ,  $se=0.023$ ,  $P<0.001$ ; LDD:  $\beta=0.057$ ,  $se=0.006$ ,  $P<0.001$ ). The latter was affected by Breed ( $F=12.72$ ,  $P<0.001$ ) and Treatment ( $F=164.99$ ,  $P<0.001$ ). The highest correlation between BW and BCS ( $r=0.876$ ) was observed in Lacaune ewes; lower correlations were observed for Chios, Frizarta and Assaf ewes ( $r=0.312$ ,  $0.363$  and  $0.137$ , respectively). Correlation coefficients between BCS and BFT (0.588, 0.594, 0.684 and 0.357 for Chios, Frizarta, Lacaune and Assaf ewes, respectively) and between BCS and LDD (0.373, 0.515, 0.584, and 0.647 for Chios, Frizarta, Lacaune and Assaf ewes, respectively). Correlations between BCS and BW, BFT and LDD differed ( $P<0.05$ ) among the four breeds. At the same BCS, the depth of subcutaneous adipose and muscle tissues were different ( $P<0.05$ ) among the four breeds. In conclusion, the existing BCS scale does not describe accurately the depletion or restoration of body reserves in different breeds of dairy sheep.

## Session 32

## Theatre 12

**Evaluation of udder morphology and milk production in prolific and meat ewes**

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Currently in Uruguay, several experiments of crossbreeding and synthetic breeds are being developed with the inclusion of East Friesian (EF), Finnsheep (F) and Texel (T) meat breeds. The milk production and udder morphology of 57 ewes (8 F, 24 EF and 25 T breeds) from three flocks were evaluated. A total of 161 records (24 F, 68 EF and 69 T breeds) were collected in three test-day controls with average days in milk (DIM) 21, 40 and 60. The ewes were randomly assigned to four experimental groups and separated from the lambs during 4 hours in a good pasture. Before that, it was allowed the nursing of the lambs and the ewes were manual milked to empty their udders. Glandular cistern area (CA) were recorded by ultrasonography (from the side area of the udder) after intramuscular injection of 1 I.U. of synthetic oxytocin, followed by mechanic milking to record the milk weight (MW) and quality (protein-P% and fat-F% percentages). All the traits were adjusted for the effects age of the ewe (1-3), type of lambing (1-2), breed (F, EF, T) and DIM and the square of DIM (both as covariables). Correlation between the residuals of CA and MW from these models were computed. EF showed a wider CA ( $35.7\pm 2.0$  cm<sup>2</sup>) than F ( $25.0\pm 3.4$ ) and T ( $28.4\pm 2.6$  cm<sup>2</sup>) breeds. This was expected because EF is a dairy breed selected to be tolerant to long milking intervals. However, no differences ( $P>0.05$ ) were observed for milk production (F  $382\pm 47$ ; EF  $430\pm 29$ ; T  $392\pm 37$  ml). The F and T breeds showed higher ( $P<0.0001$ ) P% ( $5.6\pm 0.1$  and  $5.6\pm 0.1\%$ , respectively) than EF ( $4.9\pm 0.1\%$ ) and the similar ( $P>0.05$ ) F% ( $7.0\pm 0.4$ ;  $6.9\pm 0.3$  and  $6.5\pm 0.2$ , respectively). The correlation between CA and MW residuals were 0.48 F, 0.42 T and zero ( $P>0.05$ ) for EF breeds. These findings would indicate a greater proportion of alveolar production in the EF breed and/or a better response to the release of milk by the oxytocin injection than the non-dairy breeds. Though, further research would help to determine the breed's differences between milk production and quality, as their conversion into kilograms of lambs weaned.