Gestation related gene expression in endometrial tissue of Suffolk and Cheviot ewes at gestation day 19, following transfer of Suffolk or Cheviot embryos

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The aim of this study was to investigate endometrial gene expression of progesterone and oestrogen receptor α (PR, ERα), Insulin receptor (INSR), insulin growth factors 1 and 2 (IGF-1, IGF-2) their receptor (IGF1R), IGF binding proteins 1 to 6 (IGFBPs), adiponectin receptors (ADIPOR1/R2), and prostaglandin-endoperoxide synthase (PTGS2) and mucin-1 (MUC-1) in pregnant (day 19) Suffolk and Cheviot ewes carrying Suffolk and Cheviot embryos transferred within and reciprocally between breeds. Gene expression was measured by relative quantification to the exogenous control and normalized to the geometric mean expression of the endogenous control genes (hypoxanthin guanine phosphoribosyl-transferase, ribosomal protein L19, and β- actin) taking into account the respective efficiencies. All variables were subjected to analysis of variance using a mixed procedure (SAS) that included in the model embryo breed, ewe breed and their interaction as fixed effects, and PCR plate as a random effect. Progesterone receptor expression was affected by ewe breed, with Suffolk ewes having greater expression than Cheviot ewes (0.66 ± 0.38 *vs* 0.39 ± 0.29, p=0.04). Embryo breed did not affect PR gene expression. Cheviot ewes carrying Suffolk embryos presented ($p<0.05$) or tended ($p<0.10$) to present lower PR mRNA expression than Suffolk ewes carrying Cheviot embryos or Suffolk embryos, respectively. A similar pattern was also found for *IGF-1*, *IGFBP2* and *IGFBP5* with gene expression being greater in Suffolk ewes (1.23 ± 0.23 *vs* 0.62 ± 0.29, p= 0.02; 1.04 ± 0.29 *vs* 0.57 ± 0.33, p= 0.03 and 0.77 ± 0.21 *vs* 0.41 ± 0.24, p= 0.01, respectively), without other significant effects. An interaction was observed for *IGF2* and *IGFBP3* (p= 0.02 and p= 0.09, respectively), whereby Cheviot ewes carrying Cheviot embryos had greater *IGF2* and *IGFBP3* mRNA expression than Cheviot ewes carrying Suffolk embryos, while no differences were found among Suffolk ewes. Embryo breed tended to affect *PTGS2* expression as greater expression was found in ewes carrying Cheviot embryos (1.02 ± 0.36 *vs* 0.59 ± 0.33, p= 0.07). *IGFR1* mRNA expression tended (p=0.09) to be greater in Suffolk ewes carrying Cheviot embryos than Suffolk ewes carrying Suffolk embryos and Cheviot ewes carrying Suffolk embryos. There were no differences observed for *ERα, INSR, IGFBP1, IGFBP4, IGFBP6, AdipoR1, AdipoR2* and *MUC-1*. This study demonstrates that gestation related protein expression in the endometrium of Suffolk and Cheviot ewes is affected by both the ewe and embryo breeds, showing that uterine-conceptus communication is influenced by breed very early in gestation.