Effect of estrus synchronization and superovulation protocol on the distribution of ovine embryos at different stages of development

Efeito do protocolo de sincronização do cio e superovulação na distribuição de embriões ovinos em diferentes estágios de desenvolvimento

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The compatibility between the embryo development stage and the estrous cycle moment of the embryo recipient is an important factor in the multiple ovulation and embryo transfer (MOET) program. This aspect contributes significantly to the pregnancy establishment. Thus, the present study aimed to evaluate the effect of estrus synchronization and superovulation protocol on the distribution of ovine embryos at different stages of development. For this, from October to November of 2018, 60 ewes of the Santa Ines (SI; n = 20), Morada Nova (MN; n = 20) and Somalis (SO; n = 20) breeds received intravaginal devices of 0.3 g progesterone (CIDR®, São Paulo, Brazil) for nine days and six decreasing doses (25-25-15-15-10-10%) of p-FSH (133 mg – Folltropin V®, Vetoquinol, Brazil) i.m. every 12 h. Superovulatory treatment was initiated 60 h before device withdrawal and 37.5 µg of d-cloprostenol (Prolise®, Agener União, Brazil) was administered via laterovulvar together with the fifth dose of p-FSH. Females were monitored for estrous response and were naturally mated with fertile rams. Ewes still received 25 µg of gonadorelin (Gestran Plus®, Agener União, Brazil) i.m. 36 h after device withdrawal and 16 h before beginning of the non-surgical collection of embryos, received 1 mg of estradiol benzoate (Sincrodiol®, Ouro Fino, Cravinhos, Brazil) and 37.5 µg of d-cloprostenol via laterovulvar and 20 min from start 50 IU oxytocin (Ocitocina Forte®, UBCVet, São Paulo, Brazil) iv. Embryo collection was performed between days D6 and D7 after the first natural mating by the non-surgical embryo recovery (NSER; Fonseca et al., 2013. SmallRuminRes, 111: 96-99). Data were presented in a descriptive way. A total of 53 ewes presented estrus (SO=18, MN=17, SO=18) and 445 structures were recovered from 48 ewes (SI=16, MN=15 and SO=17) subjected to NSER; of which 86.3% (384/445) were classified as viable embryos, according to the criteria established by the IETS and 7.6% as unfertilized. Of the total viable structures, embryos of 8-16 cells and morula stage represented 11.7% (45/384), while the compact morula (CM) 70.8% (270/384), blastocyst stage [initial (5.5%), blastocyst (10.7%) expanded (1.3%) and hatched (0,5)] were 18.0% (69/384). Specifically, 83.3 (174/209), 89.6 (121/135) and 88.1% (89/101) of viable structures and 75.3% (131/174), 71.9 (87/121) and 60.7 (54/89) embryos in the CM stage were observed for the SI, MN and SO breeds, respectively. In conclusion, the protocol of estrus synchronization and superovulation was efficient in the synchronization of ovulation, which reflected in the prevalence of embryos in the stage of compact morula, when the collection is performed between days D6 and D7 after the first natural mating. This time relative do estrus onset should be revised to 6 to 7 day to allow recovering of more advanced than younger embryonic stages, specially for cryopreservation.
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Keywords: MOET, *in vitro* embryo production, embryonic development.
***Palavras-chave**: MOTE, produção in vivo de embriões, desenvolvimento embrionário.*