

# 165 Superovulatory response and embryo production using a bioactive recombinant equine chorionic gonadotrophin in sheep

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In sheep, the use of a single dose of 1000 IU of serum eCG has been described to induce superovulation and produce transferable embryos ( $3.0 \pm 0.9$  per donor ewe) at a reduced cost, but the presence of anovulatory follicles ( $1.7 \pm 0.8$ ), could harm embryo development (Cueto *et al.* 2020 *Revista Argentina Producción Argentina* **40**(Suppl.1), abst). The development of a new recombinant equine chorionic gonadotrophin (reCG) evaluated in cows has recently been published (Villaraza *et al.* 2021 *Theriogenology* **172**, 8-19). The objective of this study was to evaluate the potential of reCG on the induction of superovulatory response and embryo production in sheep. The study was carried out in the Laboratory of Reproduction in Small Ruminants of INTA Bariloche during the breeding season (May, 41°S). Merino sheep ( $n = 24$ ; 4 years old; body weight of  $41.5 \pm 2.5$  kg and body condition score of  $2.5 \pm 0.2$ ) were treated with intravaginal sponges (60 mg MAP Progespon®, Syntex) for 14 days. At the time of sponge removal, ewes were assigned randomly to two treatments to receive a single dose of 280 IU (reCG280,  $n = 11$ ) or 420 IU (reCG420,  $n = 13$ ) of reCG (Folirec®, Zoovet). Oestrus detection was performed every 12 h, from 24 to 48 h after sponge removal, using an adult teaser ram. Forty-eight hours after sponge removal, laparoscopic intrauterine insemination with frozen/thawed semen ( $100 \times 10^6$  sperm per ewe) from a single ram of proven fertility was performed only in ewes that showed oestrus. On Days 7 and 8 after sponge removal, the number of corpora lutea (CL) was assessed by laparoscopic observation. Embryo recovery was carried out using the technique described by Gibbons *et al.* (2011 *Small Rumin. Res.* **95**, 61-64). The collected embryos were classified morphologically based on the guidelines of the IETS. The ovulatory response and embryo production were compared between treatments using ANOVA test. A total of 91.6% ewes were observed in oestrus (22/24) between 24 and 48 h after sponge removal (9 and 13 ewes for reCG280 and reCG420, respectively). Both dosages were able to induce superovulation and no differences were detected in all end points evaluated (Table 1). This study reports, for the first time, that reCG can produce an acceptable superovulatory response and good embryo production in sheep. These results have important implications as an alternative for control of the ovulatory response using a synthetic recombinant hormone without the need to use animals for its manufacture.

**Table 1. Superovulatory response and embryo yield (mean  $\pm$  s.e.m.) induced with administration 280 IU (reCG280) or 420 IU (reCG420) of recombinant eCG (reCG) in sheep**

<b>Variable</b>	<b>reCG280</b>	<b>reCG420</b>	<b>P-value</b>
Ewes <sup>1</sup> (n)	11	13	
Ewes in oestrus (%)	82 <sup>a</sup> (9/11)	100 <sup>a</sup> (13/13)	0.11
Sponge removal-onset of oestrus (h)	44.0 $\pm$ 1.8 <sup>a</sup>	48.0 $\pm$ 1.5 <sup>a</sup>	0.10
Corpora lutea	7.5 $\pm$ 1.5 <sup>a</sup>	10.1 $\pm$ 1.4 <sup>a</sup>	0.21
Embryos recovered	4.4 $\pm$ 0.9 <sup>a</sup>	4.5 $\pm$ 0.8 <sup>a</sup>	0.89
Grades 1–2 embryos recovered	4.1 $\pm$ 0.9 <sup>a</sup>	4.0 $\pm$ 0.8 <sup>a</sup>	0.94
Grades 1–2 embryos recovered <sup>3</sup> (%)	90.6 $\pm$ 8.3 <sup>a</sup>	82.4 $\pm$ 6.9 <sup>a</sup>	0.45
Fertilisation rate <sup>3</sup> (%)	89.6 $\pm$ 8.4 <sup>a</sup>	87.2 $\pm$ 7.0 <sup>a</sup>	0.82
Anovulatory follicles	0.3 $\pm$ 0.4 <sup>a</sup>	0.7 $\pm$ 0.3 <sup>a</sup>	0.49

<sup>a,b</sup>Different letters within rows indicate significance differences ( $P < 0.05$ ).

<sup>1</sup>Ewes hormonally treated.

<sup>2</sup>Grades 1–2 (IETS, 1998).

<sup>3</sup>Indexes are expressed only for ewes that manifested oestrus.