

# Pregnancy Rates of Recipient Animals Following Administration of a Prostaglandin F<sub>2</sub>α Receptor Antagonist to Collection Medium during Embryo Recovery

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## Introduction

Previous research has indicated that addition of a PGF<sub>2</sub>α receptor (FPr) antagonist to culture medium prevented the detrimental action of PGF<sub>2</sub>α on embryo development. The aim of this study was to evaluate addition of a FPr antagonist to collection medium on pregnancy rates of recipient animals.

## Materials and Methods

A preliminary experiment was performed to determine *in vitro* development of *in vivo*-derived morula stage frozen-thawed embryos cultured in KSOM-PVA medium with 1,000 nM AL-8810 (AL, n = 94; Cayman Chemical Inc., Ann Arbor, MI, USA), 1,000 nM AL-8810 and 10 ng/mL PGF<sub>2</sub>α (AL+PGF, n = 94), 10 ng/mL PGF<sub>2</sub>α (PGF, n = 94; Cayman Chemical Inc., Ann Arbor, MI, USA), or serving as controls (CON, n = 91). Embryos remained in their treatment for a 30-h period until blastocyst development was recorded. In a subsequent experiment across 13 replicates at 6 locations, embryos were recovered (n = 1,734) from superovulated donors on day 7 after insemination with medium containing 1,000 nM AL-8810 (AL), 100 nM AL-8810 (AL100) or with vehicle (VEH; 1 mL DMSO; Sigma-Aldrich, St. Louis, MO, USA) in a double blind study. Following collection, embryos were classified by stage and quality, and then transferred fresh to recipients or frozen (ethylene glycol, direct transfer). Frozen embryos were transferred following thawing the subsequent breeding period. Pregnancy rates were determined by ultrasonography (28-35 days post transfer) and confirmed by calving date. Data were analyzed using GLIMMIX procedure of SAS (SAS Institute, Inc., Cary, NC, USA).

## Results

Results from the preliminary experiment indicated that culture of *in vivo*-derived bovine embryos in medium containing AL-8810 improved blastocyst development compared to PGF (58.5% vs. 45.7%; P = 0.05). In addition, a strong tendency to increase embryo development was observed in AL+PGF compared to PGF treatment group (57% vs. 45.7%; P = 0.07). Collection of embryos in medium containing AL and AL100 increased overall pregnancy rates of transferred fresh and frozen embryos (60% ± 0.08% and 65% ± 0.09%, respectively) compared to VEH (50% ± 0.08%; P = 0.0007). Since AL treatments did not differ in pregnancy rates, subsequent analysis combined AL and AL100 data. Transfer of frozen embryos collected with medium containing AL-8810 (n = 301) had increased pregnancy rates (AL, 54% ± 0.07%) compared to embryos recovered without (n = 253) AL-8810 (VEH, 40% ± 0.06%; P = 0.05). Furthermore, transfer of fresh embryos collected with medium containing AL-8810 (n = 768) increased pregnancy rates (AL, 70% ± 0.05%) compared to control (n = 412; VEH, 61% ± 0.07%; P = 0.05).

## Significance

Although data collection continues, no abnormalities in calf health, birth weight or weaning weight have been observed between any treatments. In conclusion, recovery of embryos with collection medium containing a FPr antagonist improved pregnancy rates after transfer.