Effects of hormonal administration and locality influence on superovulatory responses in goats

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In goats embryo transfer faces mainly 2 limiting factors—variability of response to superovulatory treatments and premature regression of corpora lutea (CL) (Kharache et al. 2008, Barman et al. 2012). Goats can be synchronised with exogenous hormones in association with pregnant mare’s serum gonadotrophin (PMSG), human chorionic gonadotrophin (hCG), porcine follicular stimulating hormone (FSH) or injections of cycling does with luteolytic agents. However, problems are found associated with PMSG-induced superovulation (Amoah and Gelaye 1990). PMSG has the advantage of a lower cost and single-dose protocol, but the variability of response obtained restricts its use (Pintado et al. 1997).

PMSG has the advantage of a lower cost and single-dose protocol, but the variability of response obtained restricts its use. In addition, the goat is seasonal polyoestrus animal in which the oestrous cycle and intensity of oestrus depend on the breed and geographical locality such as temperate and tropical regions. This study was conducted to investigate the influence of hormonal administration and 2 different latitudinal regions on superovulatory responses.

Two different latitudinal regions were Kuala Lumpur (3°N101'E) (Malaysia) and Kunming (25°N102'E) (China). Average temperature, relative humidity, height above sea level and climate for Kuala Lumpur and Kunming were 27.8 vs. 15.6°C, 82 vs. 74%, 100 vs. 1895 m and tropical vs. subtropical monsoon, respectively. In experiment 1, does 47 and 17; does (for Kuala Lumpur) were inserted with 1 CIDR for 14 (PMSG treatment) or 17 (FSH-V treatment) days to synchronise the oestrous cycle, respectively. In experiment 2, does 58 (for Kunming) were inserted with one CIDR for 17 (FSH-V treatment) days to synchronise the oestrous cycle and compared with FSH-V treatment in experiment 1. At both sites of does were 1.5 to 5 years old, and body weight ranged between 18 to 40 kg (Kuala Lumpur) and 35 to 50 kg (Kunming).

In experiment 1, for the 14 days CIDR administration, the following hormonal injections on does were made: Estrumate (125 µg) on day 13, PMSG (1200 IU) on day 14, and hCG (500 IU) on days 15 and 17. In experiments 1 and 2, for the 17 days CIDR administration, the following hormonal injections on does were made: FSH-V (160 mg) from days 14 to 17, each day twice consecutively (20 mg, 0900 and 2100 h). After CIDR withdrawal, oestrus detection was carried out using a bucket for 3 sessions daily.

The superovulatory response was assessed after a laparotomy on 7 days after CIDR withdrawal. During the procedure, both ovaries were exteriorised, and the number of CL was recorded. Uterine horns were flushed with 40 ml of Dulbecco phosphate-buffered saline supplemented with gentamicin sulphate salt (30 µg/ml) and heparin (52 IU/100 ml) through a 2-way Foley catheter. All data were analysed using SPSS software (ver. 17, SPSS Inc., USA).

In experiment 1, for the 14 days CIDR and PMSG treatment goat, the success rate in oestrous after synchronisation and superovulation treatment was 85.11%. A total of 311 CL were observed from 38 does. After flushing, 106 unfertilised oocytes plus embryos were obtained from 38 does, the rate of embryo recovered was 34.08%. For the 17 days CIDR and FSH-V treatment goat, the success rate in oestrous after treatment was 94.12%. A total of 184 CL were observed from 16 does. After flushing, 81 unfertilised oocytes plus embryos were obtained from 16 does, the rate of embryo recovered was 43.53%. The FSH-V treatment does showed more fertilised oocytes (86.42%) compared with PMSG (23.58%), and the number of fertilised oocytes per ovulated doe (4.38) compared with PMSG treatment (0.63) (P≤ 0.05) (Table 1).

In experiment 2, comparing between Kuala Lumpur and Kunming, the respective success rates for does in oestrous