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ABSTRACT

143 Japanese black (wagyu) cattle multiple-ovulation embryo transfer: follicle -stimulating hormone source in a case study in South china

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The Japanese Black cattle (Wagyu) plays a significant part in the Japanese beef industry because it is numerically the largest breed group and comprises ~93% of the national purebred beef cow herd. Japanese Black cattle are genetically predisposed to intense marbling and to a high percentage of unsaturated fat resulting in a meat characterised by both high quality and price on the market. Like other breeds, genetic improvement and production traits in Wagyu can be fostered by the implementation of traditional reproductive strategies such as multiple-ovulation embryo transfer. A multiple-ovulation embryo transfer case study was performed in a leading production centre in Hainan island, South China. Donors (n=40) were split into 2 groups receiving either a total dose of 400mg of FSH Folltropin (FSH USA; Folltropin Bioniche Inc., USA; n=24), or 10mg of an FSH formulation produced from the Institute of Zoology of the Chinese Academy of Sciences (FSH CHN; n=16). In both cases, dosages were equally distributed over a 4-day administration schedule. Both donors and recipients (198 heifers) were synchronized for fixed-time embryo transfer (ET) and AI, respectively, by adopting the Ovsynch protocol. Such protocol consists of GnRH administration at Day 0, followed by prostaglandin administration at Day 7 and a second administration of GnRH at Day 9. Artificial insemination was performed on donor animals at 12 and 24h from the last GnRH administration, whereas for recipient synchronization receiving fresh embryos, the second GnRH administration was given at the time of second AI on donors, and ET was performed 7 days following the first AI. Final synchronization at the time of ET, judged by the ultrasonic presence of a functional corpus luteum, was 53% (105/198). The following parameters for FSH USA and FSH CHN were found to be not significantly different (Student's t; mean ± s.e.): i) ovulations (10.5±1.2 v. 8.5±1.2; P=0.2); ii) embryos (6.3±1.2 v. 5.1±1.1; P=0.5), and iii) embryos from ovulated donors (6.8±1.3 v. 5.8±1.1; P = 0.6). Recovered embryos from the 2 groups were also not different: i) degenerated embryos (1.0±0.4 v. 0.8±0.2; P=0.6); ii) morula (4.0±0.8 v. 2.6±0.5; P=0.1), and iii) early blastocysts (4.0±1.2 v. 3.3±0.5; P=0.6). Blastocysts were recovered only from donors treated with FSH USA. Out of 233 recovered embryos, 34 were transferred as fresh and 71 as frozen/thawed. Pregnancy rate at 60 days following ET for fresh and frozen/thawed embryos was 47.1 and 35.2%, respectively (P=0.2). Within frozen embryos, pregnancy rates derived from transferred morulas and blastocysts were 25 and 45.5% (P=0.07). When considering the two sources of hormones, overall pregnancy rates were similar between the two groups (28/71, 39.4% v. 13/34, 38.2%; P=0.9). Finally, pregnancy rates from the transfer of fresh embryos (9/21, 42.8% v. 7/13, 53.8%; P=0.6) and frozen/thawed embryos (19/50, 38% v. 6/21, 23.8%; P=0.6) were also not different. In conclusion, all parameters in this study did not differ between the 2 sources of FSH; however, a lower incidence of degenerated embryos and a higher pregnancy rate following transfer of frozen/thawed embryos occurred when FSH USA was used in donor animals.