BOVINE EMBRYOS CULTURED IN SERUM-FREE MEDIUM IN DIFFERENT ATMOSPHERIC CONDITIONS

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Chemically defined embryo culture systems are useful to decrease variability on embryo production as well as risks of contamination. The aim of this study was to evaluate the effect of oxygen tension on development of in vitro fertilized embryo cultured in a chemically defined medium with KnockOut™ Serum Replacement (KSR, GIBCO). Cumulus cell-oocytes complexes obtained from ovaries obtained in an abattoir were in vitro matured and fertilized in TCM 199 medium (Gibco Labs, Grand Island, NY), supplemented with 10% Estrus Calf Serum (ECS) and 20mg/ml FSH, for 24 hours. After maturation, oocytes were in vitro fertilized. Presumptive zygotes were randomly divided in four treatments: T1 (n=53): CR2aa medium plus 10% KSR in air (±20% O_2); T2 (n=85): CR2aa medium plus 10% in 5% O_2; T3 (n=129): CR2aa medium plus 10% fetal calf serum (FCS) in air, and T4 (n=88): CR2aa plus 10% FCS in 5% O_2: Embryos in T2 and T4 were denuded before transferring to culture medium while embryos in T1 and T3 were co-cultured with their own cumulus cells. Cleavage rate was evaluated at 72 hours post-fertilization. Blastocyst rate was evaluated at day seven (BLD7)/eight (BLD8) and total cell number at day eight, except for T4. Cleavage and blastocyst rates were analyzed by chi-square and total cell number by analysis of variance. There was no difference ($P>0.05$) among T1, T2, T3 and T4 regarding to cleavage (75.5%, 77.6%, 76.0% and 71.6%, respectively) and BLD7 (15.1%, 17.6%, 19.4% and 15.9%). Blastocyst rate at eight day was only different ($P<0.05$) between T3 and T4 (27.1% e 14.8%), but were similar to T1 and T2 (22.6% and 25.9% respectively). Total cell number was not different ($P>0.05$) among T1, T2 and T3 (117.3±10.7; 122.9±17.3 and 121.1±18.1, respectively). Regardless oxygen tension, embryo culture in medium supplemented with KSR is as able to support embryo development as culture medium with FCS and co-culture.