

THE INFLUENCE OF EWE SERUM ON *in vitro* OOCYTE MATURATION AND EARLY DEVELOPMENT OF OVINE EMBRYOS

PENGARUH SERUM INDUK TERHADAP PEMATANGAN OOSIT DAN PERKEMBANGAN EMBRIO DINI DOMBA SECARA *in vitro*

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ABSTRACT

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The experiments were carried out to study the influence of different sera on *in vitro* maturation and early development of ovine embryos. Sera used in this study were FLS (Fetal Lamb Serum), ewe serum collected on Day 0 (ES-D0) and Day 6 (ES-D6) of oestrus cycles. Ovine oocyte were matured and cultured in TCM-199 supplemented with 10 % of different sera. Results of this experiment showed that supplementation of ES-D0 or ES-D6 could support maturation rate (Metaphase-II) at 68.7% and 67.6%, respectively better than FLS (32.9%). The fertilization rate was significantly higher ($p < 0.01$) in medium supplemented with either ES-D0 or ES-D6 than FLS, (30.7%, 65.4%, and 65.8% for medium supplemented with FLS, ES-D0, and ES-D6, respectively). On the other hand the effect of ES-D0 supplementation followed by ES-D6 on IVM and IVC yielded in embryos cleavage (47.6%) higher than those supplemented with ES-D6 followed by ES-D6 (41.6%) and ES-D0 followed by ES-D0 (28.7%). In conclusion, supplementation of ES-D0 or ES-D6 into maturation and culture medium have given better results on both maturation rate and early embryonic development.

Key words: IVF, ovine embryos, ewe serum

ABSTRAK

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Telah dilakukan penelitian mengenai pengaruh serum induk terhadap pematangan oosit dan perkembangan embrio dini secara *in vitro*. Untuk proses pematangan dan biakan *in vitro* digunakan serum yang diperoleh dari fetal domba (FLS), induk domba oestrus (ES-D0) dan pascaoestrus (ES-D6). Oosit dimatangkan dan dibiakkan didalam TCM-199 yang diimbui 10% FLS, ES-D0 atau ES-D6. Hasil penelitian menunjukkan bahwa penambahan 10% ES-D0

atau ES-D6 dapat meningkatkan pematangan oosit mencapai tahap Metafase-II secara nyata masing-masing sebesar 68,7% dan 67,6% ($p < 0,01$) dibandingkan FLS (32,9%). Tingkat pembuahan *in vitro* dalam medium yang diberi ES-D0 atau ES-D6 secara nyata lebih tinggi ($p < 0,01$) masing-masing 65,4% dan 65,8% dibandingkan. Sedangkan pengaruh kombinasi ES-D0 dan ES-D6 masing-masing untuk pematangan dan kultur embrio menghasilkan tingkat pembelahan embrio (47,6%) lebih baik dibandingkan kombinasi ES-D6 dan ES-D6 (41,6%) ataupun ES-D0 dan ES-D0 (28,7%). Disimpulkan bahwa penambahan ES-D0 atau ES-D6 dalam media pematangan dan biakan memberikan hasil yang lebih baik untuk tingkat pematangan dan perkembangan embrio dini domba secara *in vitro*.

Kata-kata kunci: IVF, embrio domba, serum domba

INTRODUCTION

In vitro maturation or *in vitro* fertilization (IVM/IVF) is a critical step for early development of embryos. The effect of various factors including organic salt (Kim *et al.*, 1993; Pinyopummintr and Bavister, 1991), carbohydrates (Kim *et al.*, 1993; Lim *et al.*, 1994), amino acids (Takahashi and First, 1992); macromolecules and serum component (Bavister *et al.*, 1992, Pinyopummintr and Bavister, 1991), growth factor (Flood *et al.*, 1993) and vitamins (Pinyopummintr and Bavister, 1991) on the preimplantation development embryos have been investigated.

Several different media have been used for successfully maturing cow or sheep oocyte *in vitro*. For full development and subsequent fertilization the medium must contain a serum (First and Parrish, 1987). Serum as a protein supplement provided a superior environment for bovine oocyte maturation when compared with bovine serum albumin (BSA) or Fetal Calf Serum (FCS) (Lebfried *et al.*, 1986; Sanbuissho and Threlfall, 1985). Blastocyst development from bovine follicular oocyte was stimulated fol-