

Effect of EGF on *In Vitro* Oocyte Maturation and Embryo Development and Expression of EGF mRNA in Bovine Oocytes and Embryo
I. Influence of Cumulus Expression and Maturation and Embryo Development during Bovine Oocyte Maturation *In vitro* by Addition EGF

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The objective of this study was to the effect on subsequent development of EGF present in defined medium during bovine 1)oocyte maturation or 2)embryo culture. The presence of EGF during IVM, irrespective of concentration(1,10,100ng/ml), stimulated cumulus expansion and significantly increased the proportion of oocytes attaining metaphase II, the rate of cleavage, and develop to blastocyst.

1. In the group of EGF-added medium(1,10,100ng/ml), nuclear maturation rate for *in vitro* maturation was 91% to 92% but was not significantly higher than control group(87%).

2. For *in vitro* maturation, in the group of EGF-added medium(1,10,100ng/ml)the rate of cumulus cell expansion degree 2 ranged from 81% to 87%, which was significantly higher than the control group(medium with EGF not added). The rate of *in vitro* fertilization, developing to 2- to 4- cell stage, was 76% to 80%, which was also significantly higher($p < 0.05$)than control group(62%).

3. For *in vitro* maturation, in the group of EGF added in medium(1,10,100ng/ml)the development rate to blastocyst was 24.3% to 27%, which was significantly higher than control group(13.7%). The total cleavage rate in the group of EGF-added medium was 77% to 82%, which was higher than control group.

4. The development rate to blastocyst for 6 days of cultivation and the hatching blastocyst were 30.6% and 59.1%, respectively, in the group of 100ng/ml of EGF, which were significantly higher($p < 0.05$)than control group(14.0% and 24%, respectively). The numbers of cells in blastocyst were 140.2 and 148, respectively, in 10ng/ml and 100ng/ml of EGF-added medium, which were higher than 108.5 in control group.

5. The development rate of *in vitro* fertilized embryos to blastocyst in 10ng/ml of EGF-added medium co-cultured with somatic cell was 28%, which was significantly higher($p < 0.05$)than control group(11.8%). The numbers of cells in blastocyst were 141.6 for EGF-added medium and 145 for EGF+co-culture group, which were higher than control(101.6)and medium co-cultured with somatic cells(110.6).

These results showed that *in vitro* maturation and fertilization, EGF was found a significant effect of increase of development rate to blastocyst and cell number.

Key words) EGF, cumulus cell expansion, metaphase II, cell number