Egyptian Journal of Sheep & Goat Sciences, Vol. 3 (2), 2008:71-84

IN VITRO MATURATION OF SHEEP OOCYTES AS AFFECTED BY HORMONES, SERUM AND EPIDERMAL GROWTH FACTOR

Abdel-Aal, E. S.[a]; Abdel-Moneim, A. Y[b]. and Salama, O. A.[a]

[a] Animal Production Research Institute, Dokki, Giza, Egypt,
[b] Department of Animal Production, Faculty of Agriculture, Cairo University , Giza, Egypt.

ABSTRACT

The present study was designed to evaluate the effects of hormonal additives (FSH 10 IU/ ml, LH 10 IU/ ml and 17 β Estradiol 1 µg/ ml) and serum additives (10% Estrous ewes serum (EES) or 10% Fetal calf serum (FCS)) on oocyte cumulus cells expansion and the percentage of nuclear maturation of sheep oocytes. The effects of adding different concentrations of epidermal growth factor (EGF) (10, 20 and 40 ng/ml) to the tissue culture medium (TCM-199) with hormonal and serum additives on oocyte cumulus cells expansion and percentage of nuclear maturation of sheep oocytes was also examined. The obtained results showed that the highest percentage of oocytes with complete cumulus cells expansion was obtained with adding EES to the medium alone or with hormones additives (83.33% and 74.36%, respectively for class A oocytes). Whereas, TCM-199 supplemented with hormones and EES achieved the highest percentage (51.85 %) of class B oocytes with complete cumulus cells expansion. Significant differences between the treatment groups of class A and B oocytes were found ($P<0.001$). The highest percentage of mature oocytes (MII stage) was achieved from oocytes cultured in TCM-199 + (FSH, LH and 17 β Estradiol) + EES, (53.85 % and 42.59 % for class A and B oocytes, respectively).

EGF supplementation increased the percentage of class A oocytes with complete cumulus cells expansion for the different concentrations, 10, 20, 40 ng/ml (75.68 %, 75.68 % and 73.68 %, respectively). These values reduced considerably for class B oocytes. The differences between concentrations of EGF were not significant for oocytes class A and B. Incubation of oocytes cultured in TCM-199 + 40 ng EGF achieved the highest percentage of oocytes that reached MII (70.27% and 58.46% for class A and B oocytes, respectively).

Furthermore, the presence of hormonal additives and 10% EES in TCM-199 that contain 40 ng/ml EGF during IVM, had the highest percentage of sheep oocytes maturation. It could be deduced that EES alone or with hormonal additives in TCM-199 increased the percentage of oocytes with complete cumulus cells expansion. Similar results achieved by using EGF in *in vitro* maturation medium only for class A oocytes.

Key words*: Sheep, IVM, hormones, serum, EGF*.