

## **Effects of cattle oocyte quality on pronuclear formation and subsequent embryo development**

### **ABSTRACT**

The effect of oocyte quality on the pronuclear (PN) formation and subsequent development of embryos in local cattle was studied. Cattle oocytes matured and fertilized in vitro were unable to acquire developmental competence unless matured with intact cumulus cells. The presence of cumulus cells promoted normal fertilization with proper pronuclear (2PN) formation. In the present study, the characteristics and quality of cumulus-oocyte-complexes influenced the pronuclear formation but not subsequent cleavage and blastocyst formation. The oocytes from Grade A, Grade B and Grade B' were capable of fertilization and development under in vitro conditions. Fertilization rates were significantly different ( $p < 0.05$ ) among the three grades of oocytes. Grade A had the highest fertilization rates (55.0%) followed by Grade B (44.0%) and Grade B' (30.2%). Incidence of polyspermy ( $>2PN$ ) was 18.8% in Grade B' oocytes but none in Grades A and B oocytes. The mean percentages of cleavage and blastocyst rates were not significant ( $p > 0.05$ ) in Grades A, B and B' (71.6, 74.9 and 73.6%, respectively, and 10.5, 10.4 and 7.4%, respectively). In conclusion, this study indicated that the compactness of cumulus cells surrounding the oocytes influenced the pronuclear formation of cattle oocytes but not cleavage and blastocyst rates.

**Keyword:** Pronuclear formation; Blastocyst; Cumulus-oocyte complex; In vitro fertilization; Cleavage; Cattle embryo