MORPHOLOGY OF BOVINE OOCYTES COLLECTED FROM ANTRAL FOLLICLES AND THEIR DEVELOPMENTAL COMPETENCE AFTER *IN VITRO* FERTILIZATION

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This study examined the developmental competence of oocytes with different morphologies collected from antral follicles in bovine ovaries and the number of oocytes with different morphologies with regard to the ovarian phase.

In experiment 1, oocytes aspirated from antral follicles were classified into seven categories and their developmental competence (fertilizability and development to blastocysts) were examined. Oocytes were categorized into: I-oocytes with homogenous ooplasm and medium brown in color, II-oocytes as in group I, but with a dark zone around the periphery, III-ooplasm consisting of dark clumps throughout and medium brown in color, IV-pale ooplasm, V-like the oocytes in group III, but with pale ooplasm, VI-ooplasm uniformly black in color, and VII-small oocytes compared with the oocytes of other groups.

The results of *in vitro* culture in all groups demonstrated that group III had the highest rate of development to the blastocyst stage followed by groups I and II. Group V demonstrated a lower rate of cleavage than groups I, II and III, but the frequency of cleaved oocytes which developed to the blastocyst stage was the same. This could be a result of the mixture of group III and group V oocytes. These results demonstrated that oocytes classified into groups I, II and III had high developmental competence to the blastocyst stage.

In the next experiment, ovaries were classified into three phases of the follicular wave (R: recruitment, S: selection and D: dominant phases). Follicles isolated from individual ovaries in each ovarian phase and the morphology of the oocytes harvested from these follicles were examined. The average numbers of follicles in individual ovaries were different among the three ovarian groups. Ovaries in R, S and D phases had numbers of follicles (79.4, 50.6 and 34.3) in decreasing order. When collected oocytes were classified into two groups (high or low) according to developmental competence based on experiment 1 and the ratio of oocytes in ovaries in the three phases were examined, oocytes from R-phase ovaries showed consistently low developmental competence, oocytes from S-phase ovaries had a consistently high rate of developmental competence, and oocytes from the D phase had an even rate.

These results suggest that developmental competence of bovine oocytes is corre-

lated with their morphology, that oocytes with different morphologies exist with regard to the ovarian phase and that ovaries in the S phase have the largest number of oocytes with high developmental competence.