The effect of modified cryopreservation method on viability of frozen-thawed primordial germ cell on the Korean native chicken (Ogye)

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This study was conducted to establish the method for preserving chicken primordial germ cells (PGCs) that enables long-term storage in liquid nitrogen for preservation of species. The purpose of this study is to clarify the effects of fetal bovine serum (FBS) or chicken serum (CS) treatment on viability of cryopreserved PGCs in Korean Native Chicken (Ogye). PGCs separated from a germinal gonad of an early embryo of 5.5–6 day (stage 28) are suspended in a freezing medium containing a freezing and protecting agents (e.g. DMSO or ethylene glycol). After the tube was preserved in liquid nitrogen for 1 month at least, the viability of PGCs after freeze-thaw via 0, 5, 10 and 15% EG plus FBS treatment were 22.36, 40.12, 42.96, 64.36 and 55.36%, respectively. Viability assays were conducted on both the frozen group (~20ml cell suspension), and on the control group (~20mL cell suspensions of 100 PGCs in modified buffer). 0.4% Trypan blue solution (10 mL) was then added to each drop of PGCs suspension and the mixture incubated for 2 min at room temperature. These values of the 0, 5, 10 and 15% DMSO plus FBS treatment were 21.6, 30.36, 36.42, 50.39 and 48.36%, respectively. The viability of PGCs after freeze-thawing was significantly higher for 10% EG plus FBS treatment than for 10% EG+FCS treatment \( p<0.05 \) (64.36% vs 50.66%). This study established a method for preserving chicken PGC that enables systematic storage and labeling of cryopreserved PGC in liquid N at a germplasm repository and ease of entry into a database. In the future, the importance for this new technology is that poultry lines can be conserved while work is being conducted on improving the production of germline chimeras.