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Cryopreservation of Gonadal Germ Cells (GGCs) from the Domestic Chicken Using Vitrification

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We cryopreserved gonadal germ cells (GGCs) collected from 7-day-old chick embryos using the vitrification method. Gonadal germ cells were suspended in vitrification medium and plunged directly into liquid nitrogen. The recovery rates of GGCs after freezing via vitrification and slow-freezing methods were 36.8 ± 1.5 and $56.7 \pm 3.0\%$, respectively. The survival rates of GGCs in the unfrozen control, vitrified and slow-frozen cells were 98.0 ± 0.2 , 85.8 ± 1.2 and $91.2 \pm 2.8\%$, respectively. The recovery and survival rates were significantly lower for vitrified GGCs than for slow-frozen GGCs ($p < 0.05$). To evaluate the migratory ability of cryopreserved GGCs, frozen/thawed GGCs were labeled with PKH2 fluorescent dye, and 20 GGCs were transferred into 2-day-old chick embryos. After incubating for three days, the embryonic gonads were collected and the number of PKH2-labeled GGCs per chick was counted. These values for the control, vitrified and slow-frozen cells were 96.5 ± 23.9 , 102.0 ± 39.0 and 90.0 ± 34.2 cells, respectively. No significant differences were observed among treatments ($p > 0.05$). These results demonstrate that it is possible to cryopreserve GGCs using vitrification, although the recovery and survival rates are lower than those observed using the slow-freezing method.

Keywords: [chicken](#), [cryopreservation](#), [gonadal germ cells](#), [migratory ability](#), [vitrification](#)

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