

New possibilities in the gene conservation of Hungarian indigenous chicken breeds

Buda Kitti, Végi Barbara, Váradi Éva, Rohn Emese, Drobnýák Árpád, Lehoczky István, Gál János, Barna Judit, Liptói Krisztina

Research Centre for Farm Animal Gene Conservation, 2100 Gödöllő, Isaszegi u. 200.
Hungary

According to the FAO report, 32% of chicken breeds disappeared or are in critically endangered status. In vivo and in vitro gene conservation systems ensure the survival of this valuable genetic source. Continuous improvement of the applied methods for maintenance of gene banks is indispensable.

Nowadays - regarding to avian species – semen freezing is the only practically used preservation method. Cryopreservation of oocytes and embryos is impossible, because of their biophysical traits, therefore the female genome falls out of gene conservation. For the maintenance of it, orthotopic transplantation of early ovary of day old chicks can be a suitable method. However, earlier studies proved that not all breeds are suitable as a recipient for this purpose.

The aim of the study was to optimize the donor/recipient pairing and cryopreservation protocol of the early gonads of Hungarian indigenous chicken breeds.

The genetic distance of the successful pairings from intensive lines were examined, then native breeds were compared to them. According to the results, donor/recipient combinations were created which could be efficient for transplantation. White Leghorn or Novogen White formed appropriate pairs with Yellow Hungarian, Black and Speckled Transylvanian Naked Neck and Partridge-colour chicken breeds. The implanted native organs adhered (75-80%), and a histological examination proved, that ovaries and testicles are capable to produce gametes.

The gonadal tissues of these breeds were cryopreserved by vitrification using a modified method of *Wang et al.* (2008).

The transplanted frozen / thawed gonads were adhered in 72% of Hungarian Partridge colour, 57% in Black and 43% of Speckled Transylvanian Naked Neck and 20% of Yellow Hungarian chicken.

In order to check the donor derived progeny raising of hens is in progress now. As the interventions can be carried out under simple circumstances and the recipient hens can produce high number of donor gametes from donor gonads, the method can be a promising tool in the in vitro gene conservation of Hungarian indigenous chicken breeds.

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