

Commercial poultry production and conservation techniques on old, local poultry breeds in Hungary

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In the last decade both the commercial poultry production and the gene conservation activities of the Hungarian animal resources changed to a promising, positive direction. The Ministry of the Rural Development supports these activities generally and also financially.

Two institutes had been pointed out to manage both *in vivo* and *in vitro* gene conservation works. One of them is the *Centre for Farm Animal Gene Conservation*, where indigenous mammalian and poultry species are kept in small populations, as *in vivo* preservation. Besides, a currently renovated Laboratory for Avian Reproduction serves for *in vitro* gene conservation works, such as long term storage of spermatozoa, embryonic stem cells and early gonads of day old chicken.

Between 2010 and 2013 our research team worked in a bilateral project “CRYOBIRDS” with French researchers. The aims in Hungarian side are the improvement of the various aspects of *in vitro* conservation of some poultry species and the genetic testing of the effectiveness of the storage methods. Additionally, the final purpose of the project was to create the *Hungarian Poultry Cryo Bank*.

Continuation of the project present activities of the research group are (1) the development of methods of storage of different poultry semen and blastodermal cells, (2) elaboration of new, alternative methods for preservation of germ cells, (3) elaboration of transfer and storage of gonadal tissues. In the field of *sperm freezing* successful protocol with pellets was developed in guinea fowl and a practical and cheap method in nitrogen vapor for gander sperm. Working with low quality semen is less successful; however with the fewer survived cells can also be achieved fertility, thus the haploid genome can be saved. Slow freezing of chicken blastodermal cells resulted in 30-40% survival which is also promising, regarding to the restoration of the whole genome by transfer them into the recipient germinal disc or blood vessel. As a new approach, vitrification of avian sperm and blastodermal cells are in progress now. Since in these cases not a single cell or embryo has to vitrificate but cell suspensions, they need protocols different from that of used in mammalian oocyte or embryo.

In the case of birds the newest and most complicate strategy for maintaining the male and female genetic material is the surgical remove, long term storage and transplantation of early gonads. The surgical procedure has already been elaborated, thus with fresh gonads successful transplantations were carried out. There are promising data about the vitrification of the gonads and there are trials in progress on the possibilities of transplantation between commercial and indigenous poultry species.