

O. V. Kruglyak, I. S. Martynyuk. Economic bases of gene pool preservation of local and endangered breeds of farm animals in Ukraine

The aim was to determine the amount of state financial support for the full gene pool preservation of local and endangered breeds of farm animals in Ukraine for 2016-2020.

Given the great strategic and economic importance of the problem of gene pool preservation and rational use to enhance food security, the level of state financial support for preservation of the gene pool of local and endangered breeds of farm animals was determined for using two methods of conservation: *in situ* (live animals) and *ex situ* (cryoconservation of their genetic materials).

The level of budget support to preserve gene pool objects involves calculating the minimum (normative) amount of genetic resources (livestock females, bull semen, embryos) and rational choice of methodical approach to determining the level of budget support for the preservation of each type of genetic resources.

The level of budget support for *in situ* maintenance of gene pool objects was determined based on level of budget subsidy per head and livestock number of each species, recommended to preserve (normative). The basis of the level of budget subsidies was determined as compensation amount of normative costs for feed produced at cost. Normative costs of feed were determined on the basis of scientifically grounded rations for species and breeds of animals taking into account their productivity.

The full *in situ* preservation of dairy and dual-purpose breeds of cattle requires the holding herds of each breed which include animals of all main bloodlines, where at least 3 live bulls and 60 cows should be kept per bloodline. In gene pool subjects of beef breeds at least 3 bulls and 20 cows should be kept per bloodline. Breeding cattle of all breeds should be performed by linear purebred breeding and randomized fixing of bulls in lines. Under these conditions, it is possible to preserve purebred livestock number for 5-6 generations, or 20 years. To preserve *in situ* the gene pool of local and endangered breeds of pigs, sheep and poultry it is necessary to provide herd size not less than 25 boars and 100 sows, 20 rams and 200 ewes, 10 stallions and 50 mares, 50 geese and 200 fowl, 50 drakes and 250 ducks, 50 cocks and 250 hens.

The constancy of gene pool of local and endangered breeds is fully possible to provide only by *ex situ* method, providing measures to preserve genetic fund of breeds, types, lines in an artificial environment (cryoconservation of gametes, somatic cells, zygotes, tissues).

Ex situ preservation of the gene pool of local and endangered breeds is expedient as a "virtual" cryo-herds. For their expansion annually 1-3 thousand doses of bull semen of dairy, dual-purpose and beef breeds per each farm or genealogical line (depending on the number of bulls in a line) must be collected and stored in cryo-depositories in over 3 thousand doses of bull semen for each line. Annual accumulation and storage of semen of rams should be accordingly 1.2 and 2.4 thousand doses, boars – 2 thousand doses and stallions – 300 doses in both cases. The annual need for purchasing sires' semen of farm animals is 35.7 thousand doses. For

implementation of programs for preserving the gene pool of local breeds it is necessary to pass 10% of annual purchased semen to the Bank of Animal Genetic Resources of Institute of Animal Breeding and Genetics nd. a. M.V.Zubets of NAAS.

The normative costs for an annual storage of sires' semen in 2015 have been determined, which amount is UAH 4.54 and UAH 2.98 according to normative capacity of cryo-depositories (5 thousand doses and 20 thousand doses).

The project of preserving populations of local and endangered breeds of cattle as "cryo-herds" (cryopreserved bovine embryos) during 2016-2020 requires the state support for obtaining 250 bovine embryos, prepared for long-term storage, of each breed and storing them in Bank of Animal Genetic Resources of Institute of Animal Breeding and Genetics nd. a. M. V. Zubets of NAAS.

To provide the full preservation of the gene pool of local and endangered breeds of farm animals in Ukraine using two methods of conservation: in situ (live animals) and ex situ ("virtual cryo-herds") during the next five years it is necessary to finance UAH 75,137.5 thousand from the State Budget. The implementation of the developed economic mechanism ensures the gene pool preservation of domestic autochthonous and local breeds of farm animals and their further use for breeding animals of specialized and dual-purpose breeds, the execution of commitments laid down by international agreements of Ukraine for the biodiversity preservation. These research results have been used in the development of the Programme of preservation of local and endangered breeds of farm animals in Ukraine for 2016-2020.

***Keywords:* gene pool preservation, local, endangered breed, budget support, genetic resource, normative number, annual subsidy level**