

Institutional and legal framework for ex situ conservation at national level - Slovenia

- **Historical overview of gene bank development**

After Interlaken Slovenia adopt Multi Year Program of work (MYPOW) - the program of action of AnGR which covering the scope of conservation of specific indigenous and other breeds classified as critical. The MYPOW was approved by the government and is performed by the Public Service (PS) for AnGR. Rules for the PS were adopted by the government in 2008. Genetic reserves of farm animal genetic resources important for agriculture are constantly monitored and controlled by the PS for AnGR conservation.

The management of AnGR in Slovenia is regulated by the Livestock Breeding Act, which was accepted in 2002. A smaller part of this field is also regulated by the Agriculture Act.

- **Objective(s) of national cryopreservation programme/policy**

- **Collection goals**

In accordance with the Livestock Breeding Act the Republic of Slovenia shall ensure and maintain genetic reserves for the species, breeds and strains of domestic animals in the form of a minimum number of domestic animals, doses of semen, ova or embryos and/or other biological material.

Genetic reserves are determined by the Regulation on conservation of farm animal genetic resources which determines the preparation of requirements for systematic activities ensuring an overview of the minimum reserves of genetic material for each breed of farm animals.

Cryobanking is based on different aims:

- to support populations conserved *in vivo* in cryo aided live scheme as a back-up in case genetic problems occur in the living population (loss of allelic diversity, inbreeding)
- to increase effective population size of small populations and reduce genetic drift
- as a genetic resource for research
- to reconstruct the breed in case of extinction or loss of a major portion of the population
- to assure the minimum number of genetic material (semen, ova, embryo, DNA,...) for individual breed, especially local breeds.

- **Collection categories**

The Gene Bank (conservation *ex situ*) *in vitro* is established for individual local and other breeds which are "endangerment" or "critical" in accordance with Regulation on conservation of farm animal genetic resources. The Gene Bank also conserved the genetic material for other breeds (traditional), which are not endangerment or critical but are important for food production.

There are four different locations of the Gene Bank storages in purpose to prevent eventually loss of the genetic material. Two of them are located at the insemination centres (IC) and two of them at the Breeding associations.

- **Achievements until today**

Slovenia has made first steps towards the systematic *ex situ* conservation of AnGR biodiversity in 2002. The program of conservation of frozen semen was first performed only for cattle (Slovenian Brown, Black and White, Cika, Charolaise, Limousine and Belgian Blue). Only the experimental quantities of semen have been collected and preserved from horses, pigs and other species in that time. In accordance with the Slovenian Program of conservation of biodiversity in animal husbandry

there was established a depository, where mainly samples of tissue, blood and DNA from different species were collected and storage.

The present state of the conservation of the farm AnGR is satisfying. In 2010 the EFABISnet-cryoweb database was established, where today all data of the collected material are inserted. Inserted data are composed from pedigree and the number of samples and doses of semen for each donor.

- **Future plans**

In the future we attend to enlarge the number of the collected material, special for endangerment and critical breeds. An inclusion of ova and embryo samples collection is also in project.

- **Participation of stakeholders: responsibilities/roles by stakeholder/actor**

- **Laws, regulations or arrangements between stakeholders**

A few stakeholders are involved in the conservation of farm AnGR in Slovenia; Ministry for Environment and Agriculture (MEA), recognized breeders' organizations, approved organizations, other organizations performing specific tasks in the PS (University of Ljubljana-Biotechnical Faculty, Veterinary Faculty, Agriculture Chamber) and farmers.

The MEA provide the legal base for utilisation and conservation programmes. The MYPOW was approved by the government and is performed by the Public Service (PS) for AnGR. PS for farm AnGR conservation established an expert council. The members of the expert council are: a representative of PS, a representative of each recognized breeders' organizations, one representative of each of the other organizations performing specific tasks in the PS. Expert council gives its opinion to the annual program and annual reports and all the important questions regarding the work of PS. Annual program and reports are approved by the MEA.

Approved organizations are Insemination Centres (IC), Test Centres, and Centres for reproduction. In accordance with the Breeding Program the ICs have to perform the arrangements, which are in concordance with Program of conservation of biodiversity in animal husbandry. According to the contract between ICs and PS for farm AnGR, the IC preserves the semen for genetic reserves. The PS is the owner of the preserved genetic reserves in Gene Bank. The breeders are allowed to use the semen after the approval of the PS.

The program of conservation of biodiversity in animal husbandry in Slovenia encouraged rearing the local breeds in the original autochthonous environment. Inclusion of each animal in the program entails a special contract that binds the owner to fulfil all required conditions. In this manner the owners are then entitled to receive an annual subsidy from the Ministry for Environment and Agriculture (MEA). Professional activities are performed by the Zootechnical Department of the Biotechnical Faculty, University of Ljubljana. The Zootechnical Department is in charge of the national selection programme for individual species of farm animals. Some other institutions also take part in monitoring and performing activities related to production.

- **Transboundary issues/arrangements**

There are no arrangements or collaboration with any neighbour country related to cryoconservation. However, there were some transboundary collaborations for science and research purpose.

- **Decision making process**

Often, because financial and human resources are limited, breeds cannot be given the same priority for conservation. Decision making process on which breed to conserve and by which technique was based on a general policy (Livestock Breeding act, Program of conservation of biodiversity in animal husbandry,...). The most important fact was to conserve the genetic material for future use and to maintenance the rural cultural diversity by using local breed. Moreover, local breeds have to acquire a special agricultural and rural value in the future. We decided to use combination of *in situ* and *ex situ* techniques.

- **Type of material**

The decision on sampling of donor animals, type and amount of genetic material to be stored was based on population size and their endangerment status, available funds and aim of storage. The Depository was first so called storage, before development of Gene Bank. The Depository is composed by blood, semen, tissue and DNA material. The aim of the Depository was first to collect the genetic material for research purposes. After establishment of the Gene Bank, the PS included two already existing ICs and two new storages located at the Biotechnical Faculty-Zootechnical Department and Veterinary Faculty. At those four locations the collection of the genetic reserves is semen. All samples and doses of semen are inserted in Cryoweb database.

- **Collection targets (populations, individuals)**

The collection targets are breed populations, especially small size population. Also the breed populations important for food production are included in collecting the genetic material as genetic reserves.

- **Storage and documentation**

- **Storage facilities and rules**

The ICs have a role as a distribution centres for semen, mainly bull semen. There are small amounts of other species semen. The distribution of the commercial semen is arranged by Livestock Agriculture Act.

Approved IC is an organization that kept the required number of breeding animals for the production and marketing of semen for one or more breeding programs. IC must be entered in the register for insemination centers. IC is obligated to keep the prescribed data of breeding males and records of semen from its own production. Marketing with semen is permitted only through the IC. The semen collected and conserved for genetic reserves in the frame of Gene Bank is manage by the PS for AnGR.

The storages at the Biotechnical Faculty and the Veterinary Faculty are aimed only for cryoconservation and research purposes.

Data management and documentation

All collected data (donor pedigree, amount of semen, and micro location of each sample) are managed by PS for AnGR. The data are inserted into cryoweb database. The PS makes annual reports to the ministry.

- **Gene bank security**

The accredited labs, ICs have their internal instructions for controlling the quality and the use of the genetic material. Gene bank security is also managed with conservation of the genetic material of one donor at least two different locations.

- **Sanitary arrangements/regulations**

According to the Regulation on conservation of farm animal genetic resources (Article 20) the genetic reserves by species, breeds or strains of domestic farm animals have to be assured and maintained. The PS has to assure the required amount of the genetic material for genetic reserves. The method of the conservation has to assure the quality of the genetic material. Moreover, the applicability of the genetic material needs to be checked. In case of suspicion on deterioration of the genetic material, it has to be restored.

- **Legal issues (related to genetic material and data)**

- **Ownership and IP**

According to the contract between ICs and PS for farm AnGR, the IC preserves the semen for genetic reserves. The PS is the owner of the preserved genetic reserves in Gene Bank. The PS makes a proposal about use of the genetic material, approval of the proposal is required from the Minister.

- **Collecting new material: Articles and conditions in Material Acquisition Agreements [translated agreement]**

According to the Regulation on conservation of farm animal genetic resources (Article 19) the genetic reserves have to be determined by type of genetic material. The constituent part of the genetic reserves is the amount of semen for assurance of the reproduction and insemination at critical situations. The amounts of semen have to assure the insemination at least two generations by each breed. There are several types of the genetic material for cryoconservation; semen, oocyte, embryo, somatic cells and DNA. Already valued methods of cryoconservation are preferred.

An example for Cika cattle: The PS in the field of Animal genetic resources makes together with ICs the selection of bulls for genetic reserve. Additionally, the necessary number of doses is determined for individual bull. After examination the quality of the semen, the zootechnical estimation of potential donors of semen is made every year. If necessary, the new unrelated bulls are included.

Beside cattle as well the semen of less related Slovenian autochthonous breeds of sheep and goats is also collected and stored.

- **Access to gene bank: Articles and conditions in Material Transfer Agreements [translated agreement]**

Transfer and marketing with breeding material is arranged according to the Livestock Breeding Act (Article 103). The breeding material used for transfer has to be indicated according to regulations and must have a prescribed Zootechnical document.