



## INSTITUTIONAL AND LEGAL FRAMEWORK FOR EX SITU CONSERVATION IN SPAIN.

### Historical overview of gene bank development in Spain.

Spain is one of the countries with greater domestic animal diversity in the European continent. The high number of breeds in Spain is the result of our wide variety of agro-ecosystems, the millenarian livestock practices and the recent introduction of foreign breeds to provide the intensive animal production systems.

Currently, the Official Catalogue of Livestock Breeds of Spain includes 181 breeds, being 154 of them autochthonous. Taking into account their level of endangerment, 128 breeds are classified in risk of extinction, and their distribution by species is as follows:

- Bovine: 31	- Ovine: 33	- Goat: 16	- Pig: 8
- Horse: 14	- Donkey: 6	- Hens: 19	-Dromedary: 1

Nevertheless, the situation within this category of the breeds is highly diverse, with regard to their population size, geographical distribution and structure and activity of the breeder's organizations in charge of its conservation.

This greater diversity of animal genetic resources supposes an enormous challenge, to establishing a coordinated and efficient policy of breed conservation. Nevertheless, the central and regional administrations have obtained important advances, by giving priority to the constitution of breeder's organizations. These associations are managed by the own keepers, who hire specialized technicians and, have also the support of researchers of public institutions (as universities). In order to get the maximum implication of the breeders, the planning of the conservation activities for each breed falls under the responsibility of the keepers.

The phenotypic and genetic characterization of the breeds and the in-vivo conservation activities have been the priorities for the breeder organisations; while the in vitro storage of genetic material has been considered secondary

Historically, the stations of animal genetic improvement and reproduction (CENSYRAs) of the regional governments, research institutions and universities have developed and operated gene banks for cryoconservation of animal genetic resources from our autochthonous breeds. However, these activities have been implemented without the necessary coordination among the gene banks, and between gene banks and breeders.

Currently, the main objective of the Ministry of Agriculture, Food and Environment of Spain is to consolidate the freezing and storage of the reproductive material of our autochthonous breeds, as key the element to ensure their long-term conservation. Thus, the activities that we are now developing are aimed to build up the coordination among all the stakeholders involved in cryoconservation and to strengthen the activities of the National Gene Bank (created in 1998).

### Objectives of the national policies of cryoconservation.

The basic principles and objectives in relation with the animal genetic resources cryoconservation at national level have been laid down in the National Program for the Preservation, Improvement and Development of Livestock Breeds (Royal decree 2129/2008). This program establishes the frame that synthesizes all the European Union and national zootechnical legislation. The National Program defines a gene bank as:

*“An installation, autonomous or linked to a breeding centre or storage centre, established for the purpose of storing genetic material indefinitely, with the aim of preserving the national genetic heritage. The genetic material shall be sourced from animals registered in the herd book of their breed, shall have been obtained with the consent of the owner of the animal concerned and shall enable DNA to be extracted in sufficient quantity and quality to guarantee the intended activities, even after the death of the animal. When the biological material to be used is exclusively DNA, the term “DNA band” shall be used”*

In addition, the National Program sets down the priorities of the cryoconservation activities of the breeder's organisations:

1. Material from breeds classified as in risk of extinction.
2. Material from high genetic quality animals.
3. Material from breeds for which it is necessary to ensure the maintenance of its genetic variability.

A Plan of Action has been developed, to achieve the objectives of the National Program, being its activities in relation to the cryoconservation of the Spanish animal genetic resources:

- To promote studies on new ex-situ conservation techniques, using the experience and know-how of centres for reproduction and breeder's associations; and strengthen the collaboration with other centres, and the development of new projects and research group in this field.
- To establish the criteria (genetic, biological and sanitary conditions) to create and manage the gene banks.
- To strengthen the role of National Gene Bank, where the genetic material of breeds in risk of extinction will be stored, guaranteeing a duality of samples, recommended for their correct conservation, avoiding unforeseen risks.

At the technical level, the National Program establishes that each keeper's association has to develop and submit to the zootechnical authorities (central or regional government) a conservation breed program for its official approval. The conservation breed program has to set down the kind of tissue selected to store in the gene bank, the suitable number of doses and the number of donors of these doses. Furthermore, the National Program binds the breeder's association to send a “copy” of their gene bank to the National Gene Bank.

At this moment, the Conservation Breed Programs have been approved by the central and regional zootechnical authorities and the breeder's associations are implementing them. In addition, a task group on cryoconservation has been created to increase the coordination between the stakeholders, analyse the situation of the ex-situ conservation activities in Spain and establish the criteria to create and to manage the gene banks. The members of the task group are representatives of the Federation of breeder's associations, the Ministry of Agriculture, Food and Environment, and the National Gene Bank.

#### Involvement of stakeholders on the cryoconservation activities.

The associations of breeders are in charge of the management of the breeds, so they have to develop the in-situ and ex-situ conservation activities. These activities have to be laid down in their Conservation Breed Program, which, as we said before, have to set down the

kind of tissue selected to store in the gene bank, the suitable number of doses and the number of donors of these doses

The Conservation Breed Programs have to be endorsed by experts in animal genetics, belonging to research centres or universities with a recognized prestige in this field.

Each keeper's association should be able to establish its own gene bank, or to reach agreements with public centres or enterprises in order to store the material collected from their breeds.

Although, a specific regulation for the gene banks in Spain does not exist, these facilities have to fulfil the national legislation about collection, transport and storage of reproductive material (Royal Decree 841/2011). Therefore, gene banks (with certain exceptions) have the same duties than the storage commercial centres of semen, oocytes or embryos.

The regional and central administrations are in charge of approving the Conservation Breeds Programs; verifying that they fulfil the established requirements as far as type and amount of material collected and number of donors and who is the centre where the gene bank is settled. Sometimes, the Regional Administrations are the owners of the facilities where the gene bank is located. On the other hand, administrations establish the subsidies for the breeder's associations to support their activities, including the development of the Conservation Breed Program. In addition, administrations are also responsible to verify the correct application of the conservation activities.

Finally, the National Gene Bank is in charge to store a copy of the material of the Breeder's Associations gene banks.

#### Decision making process.

The types and amount of germplasm to be collected and the number of donors are established by the Managing Commission of the Conservation Breed Program of each Breeder's Association. The constitution of this Commission is a requirement of the Royal Decree 2129/2008, and its members are: the representatives of the keepers, the expert in genetics endorsing the conservation program, the technicians of the association, a representative of its gene bank and a representative of the administration. The Commission sets down the technical measures, adapting them to the situation of the breed.

The National Coordinating Committee for the conservation, improvement and promotion of livestock breeds, is the highest decision making body in our country with relation to the conservation and genetic improvement of the livestock breeds. The members of the Committee are representatives of both the central and regional governments, and it is in charge of approving the technical measures on conservation activities of and genetic improvement (including those related to the cryoconservation).

#### Storage and dossier files.

There is no national rule to regulate the storage or dossier files of gene banks; nevertheless the gene bank facilities have to fulfil the requirements laid down in the Royal Decree 841/2011 for the commercial storage centres (with some exceptions). Also, the documentation and the identification of the germplasm have to fulfil the Royal Decree 841/2011.

The National Gene Bank, in addition of the requirements of Royal Decree 841/2011, demands to all the delivers of germplasm the following documents:

- The application form to storage germplasm in the Gene Bank.
- Written warranty, signed by a animal genetic expert, of the correct selection of the donors.
- Pedigree of the donors.
- Information about freezing procedures.

#### Sanitary arrangements.

As we have previously said, the germplasm samples have to fulfil the same sanitary rules established for the national marketing of semen, oocytes and embryos (similar to the European legislation for Intra community trade). Nevertheless, the Royal Decree 841/2011 establishes some exception to this sanitary rules, in case of:

- Breeds in risk of extinction.
- **Germplasm with destination of the gene banks.**
- Donors animals from difficulty handling breeds.

#### Legal aspects.

Every gene bank has established its won rules to regulate the ownership and release of the germplasm stored in their facilities. There is a wide variety about the agreement between gene banks and breeders or their associations.

Until now, the stored germplasm in the National Gene Bank has been purchased by the Ministry of Agriculture, Food and Environment, and the keepers of the animal donors have the possibility to use it under the condition of returning the same amount of material from the descendant obtained with the released germplasm.

Currently, a Task Group is working on the development of a new arrangement, where the stored germplasm will be owned by the breeder's associations; however they would be allowed to use it only for the following purposes:

- Breed reconstitution.
- To introduce genetic variability into already established populations.
- To recover the Gene Bank of the breeder's association in case that the original one were destroyed.

However, even in such cases, the release of germplasm has to be approved by the National Coordinating Committee for the conservation, improvement and promotion of livestock breeds, and should be endorsed by technical reports.