Information concerning the Biobank in Poland

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1. Historical background

The first attempts to freeze semen were made in Poland in the 1960s at the National Research Institute of Animal Production. A method in which semen was frozen in glass ampoules was used. In the second half of the 1960s, experimental research was conducted to develop a semen pellet freezing technique and to put it into practice. Artificial insemination stations were established in Poland. The Central Semen Bank was created in 1968 at the National Research Institute of Animal Production for the purpose of storing bull semen from AI stations and imported semen. In 1988, the second Semen Bank of the Central Animal Breeding Station was established in Poland. Over 20 years, almost 10 million semen doses were accepted for storage. By 1996, the bank stored about 1300 doses of imported semen.

In the 1990s, the establishment of a genetic reserve for threatened species and breeds of farm animals was begun. During this period, about 41000 semen doses from 93 Polish Red bulls and 1742 embryos of this breed were collected in addition to 680 semen doses from Swiniarka rams, 3535 doses from Olkuska rams, 710 doses from Mountain Sheep, and 520 doses from Wrzosowka sheep.

The bank also provided services through cooperation with foreign companies such as Rinderproduktion Niedersachsen GmbH, Genes Diffusion, and American Breeders Service. Since 2005, the bank's activities have been limited to cattle semen storage in accordance with the applicable regulations.

In 2004, in its capacity as the National Focal Point for Animal Genetic Resources, the National Research Institute of Animal Production undertook to perform activities aimed at *in situ* and *ex situ* conservation of several animal breeds enrolled in the biodiversity conservation programme. As a result of these activities, the National Biobank is being established.

2. Goals of the national cryopreservation programme

The main goal of the *ex situ* conservation programme is to create a repository of biological material in the form of semen, embryos and DNA from endangered breeds and from other breeds maintained in Poland for the purpose of biodiversity conservation.

The collected material, which should be added to on an ongoing basis, will be used:

1. to maintain an *in situ* conserved population by safeguarding the living population against possible genetic problems (e.g. loss of allele diversity, inbreeding, emergence of harmful genetic combinations), by increasing the effective size of small populations, and by reducing genetic drift,

2. to restore a breed in case it is becoming extinct or depopulated,
3. to create new lines/breeds,
4. to modify a breed rapidly,
5. for research purposes.

Items 1 to 3 generally refer to endangered populations or to protection of small populations. Genetic material is stored to ensure that a breed or its genetic variation is maintained. Gene introgression[1] (i.e. recovery programmes) and creation of artificial lines are specific examples of cryopreservation application, mentioned under item 3. Item 4 refers to unthreatened populations and populations selected to accomplish a new goal for a breed. Item 5 encompasses many research aims, e.g. retrospective analysis of genetic variation in a population.

Legal regulations

Current regulations provide no definition of genetic material, while regulations on sanitary protection of genetic material concern farm animal (cattle, pig, goat, sheep and horse) semen, oocytes and embryos that are officially approved and authorized for marketing.

In accordance with current regulations, genetic material can only be processed, conserved and stored in the collection and storage centres approved and inspected by Veterinary Inspection. The semen and oocyte collection and storage centres must be operated separately for every species (cattle, pigs and horses) but can be shared for sheep and goats. The centres dealing with the semen and embryos of the same species should also be operated separately unless with consent from the District Veterinary Officer.

The principles under which the genetic material collection and storage centres are operated, organized and equipped are specified by national regulations in the form of laws and decrees, or by international regulations in the form of directives based on OIE recommendations (International Animal Health Code). The national regulations of 1 May 2004 were amended to comply with European Union regulations. Polish legislation includes 17 legal acts that refer, directly or indirectly, to the conditions and principles under which genetic material can be collected, produced and stored. The list does not include regulations concerning the government's animal infectious disease control programmes, which also indirectly concern genetic material.

3. Participation of institutions in the cryopreservation programme

In organizational terms, the National Biobank (Krajowy Bank Materialow Biologicznych, KBMB) should be an integral part of the Nationwide Programme for Animal Genetic Resources Conservation. This programme has been carried out and coordinated by the National Research Institute of Animal Production (Instytut Zootechniki Panstwowy Instytut Badawczy, IZ PIB). At the present stage of organization, there are no precise rules on the organizational structure and principles of cooperation that account for institutions, organizations and government and private entities other than the National Research Institute of Animal Production. The following should be considered as potential partners of the National Biobank in this programme: the government of the Republic of Poland, NGOs (Polish Federation of Cattle Breeders and Dairy Farmers or Polish Association of Beef Cattle Breeders and Producers), breeders associations (Sheep Breeders Association, Horse Breeders

[1] Introgression – the introduction of genes from one species to the gene pool of another by crossing.

Association), private entities (Animal Breeding and Insemination Centres, SHiUZ), firms using biobank services, and research institutions (agricultural schools, universities).

Legal acts

The national legislation includes a number of legal acts that refer, directly or indirectly, to the conditions and principles under which genetic material is collected, produced and stored. The list does not include regulations concerning the government's animal infectious disease control programmes, which also indirectly concern genetic material.

One example of the existing executive regulations are agreements between the existing bank and a private semen importer for storage of biological material in the bank (monthly payment).

Transboundary issues – no arrangements

4. Decision making process for the type of material

The present collection of genetic material, stored at the National Research Institute of Animal Production's Bank of Genetic Material, is shown below:

Cattle

Breed of cows	2006	2009	2010
Polish Red cattle			
- No. of semen doses issued - No. of semen doses (no. of bulls) - No. of embryos (no. of bulls)	1490 40000 (102) 1916(47)	1500 38985 (114) 1916(47)	143 39712 (121) 1916(47)
White-backed			
- No. of semen doses (no. of bulls)	600(3)	600(3)	600(3)
Red-and-White			
- No. of semen doses issued - No. of semen doses (no. of bulls)		938(3) 1289(4)	1007(4) 4061(10)
Black-and-White			
- No. of semen doses issued - No. of semen doses (no. of bulls)		2112(10) No data available	2112(10) No data available

Sheep

Breed of sheep	2006	2008	2010
	No. of semen doses/No. of donors		
Swiniarka	680/6	680/6	680/6

Olkuska	3575/19	3650/21	3650/21
Mountain	710/3	710/3	710/3
Romanov	640/6	640/6	640/6
Wrzosowka	1217/12	1217/12	1217/12
TOTAL	**6822/46**	**6897/48**	**6897/48**

5. Storage and documentation

The documentation is only available in paper form. We have no electronic version. An electronic collection management system will be launched after the bank has been expanded. The documentation will be stored in two versions: a secure electronic version (originals and copies) operated within a closed network, and a paper version.

Data and documentation management – only authorized persons will have access to the documentation. Two to four data access levels will be introduced after the bank has been expanded.

Gene bank security – Sanitary security will be ensured in keeping with current regulations (clean and dirty sections). The documentation and the collected data will be secured as two separate panels.

6. Sanitary conditions

The purpose of sanitary protection is to ensure epizootic safety, to minimize human health risk, to ensure appropriate quality of the stored material, and to enable the collected material to be properly used. These goals are carried out within wide limits at every stage of handling the genetic material (determination of collection, processing, preservation, storage, marketing and transport conditions, and the conditions of using the collected material). The highest level of sanitary security will be established for processing and conservation laboratories, for material quarantine, storage, packaging and dispatch facilities, and for equipment cleaning and disinfection facilities. It is absolutely essential to observe the rule that genetic materials must not cross each other or be returned on their way from the collection facility, through the laboratory and individual rooms, up to the dispatch facility.

7. Legal problems related to the genetic and material data collected – none

Collection of new material: legal aspects, agreements – planned

Access to the gene bank: agreements on transfer of material – planned