

**STUDY REGARDING THE BIODIVERSITY AND THE CONSERVATION
OF GENETIC RESOURCES ON FARM ANIMALS**

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Abstract

Biodiversity of farm animal genetic resources is essential for food production, biodiversity conservation landscape as a source of income for farmers and as an important part of our cultural heritage. The purpose of the European Program for Conservation of Animal Genetic Resources is characterization, collection and utilization of genetic resources in order to enhance favorable effect on agriculture, coordination between the main EC actors and organizations around the world concerned with the conservation of animal genetic resources and an effective exchange of information. According to GEO 194/2005, Law no.137/2006 and Order no. 555/2006 the animal owners who drafted conservation programs for critically ill, endangered or vulnerable population received financial support from the state budget. Until 2009 – 14 animal species were preserved, this representing 123 pure breeds and lines owned by the 21 member associations. Regarding goats, in the gene bank there are cryopreserved doses from 5 races, the number of doses ranging from 1818 for breed of milk Saanen to 68 doses for Boer breed, which is a breed of meat. The National Agency for Animal Breeding and Reproduction "Prof. Dr GKConstantinescu" aims at developing and maintaining in good conditions the national genetic heritage currently in conservation" ex situ " within the gene bank of biological material from valuable livestock breeders. The gene bank is a link between the precious genes and government intervention in restocking the breeds in danger of extinction.

Keywords: biodiversity conservation, gene bank, cryopreservation

1. INTRODUCTION

Biological diversity or biodiversity is one of the key terms in the field of conservation, including the richness of life and various models. Convention on Biological Diversity (CBD) defines biological diversity as "the variety of living organisms from different backgrounds, terrestrial, marine and other aquatic ecosystems and ecological complexes of which they are part, this including the diversity inside the species, between species and ecosystems".

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Livestock biodiversity issues was the subject of the UN Convention in Rio de Janeiro on 5 June 1992.

- "Diversity can not be made intelligible and manageable, but through classification and systematization" said Dobzanski in 1951.
- It is necessary both national effort and international cooperation for the implementation of minimum order in Animal taxonomy.

"Each species, breed, variety and line both the animal and plant is as equally important in terms of genetic, regardless of its economic importance at a time" [3].

For the ratification of the Convention on Biological Diversity it was issued Law no. 58 of 13 July 1994, which looks at all aspects discussed at that time.

During the Rio Conference the following terms have been defined:

Biological Diversity, variability among living organisms from all sources.

Biological resources, genetic resources, organisms or parts thereof, populations or any other biotic component of ecosystems.

Genetic resources genetic material of actual or potential value.

Domesticated or cultivated species in which the evolutionary process has been influenced by humans.

Genetic material, any material of plant, animal or microbial origin containing functional units of heredity.

The country of origin of the genetic resources possesses those genetic resources under "in situ" conditions.

The country providing the genetic resources takes them from genetic "in situ" or "ex situ" sources, which may or may not have originated in that country.

Preservation "in situ", conservation of ecosystems and natural habitats with the maintenance and recovery of viable populations of species in their natural environment.

Conditions "in situ" where genetic resources exist within the ecosystems and natural habitats and the environment in which they have developed their distinctive properties.

Conservation "ex situ", conservation of components of biological diversity outside their natural habitats

- conservation of biological diversity is a common concern of humankind
- states have sovereign rights over their own biological resources, are responsible for

conserving their biological diversity, and for the abiding use of biological resources.

Biological diversity is reduced by:

- certain human activities;
- general lack of information and knowledge regarding biological diversity;

The purpose of this paper is the urgent need to develop a real scientific, technical and institutional capacity, which will ensure a fundamental understanding necessary to plan and implement appropriate measures for biodiversity conservation.

2. MATERIAL AND METHOD

The local breeds of cattle, buffaloes, sheep and goats endangered located in conservation programs "in situ" and "ex situ" in Romania were analyzed.

3. RESULTS AND DISCUSSION

The purpose of the European Program for Conservation of Animal Genetic Resources is characterization, collection and utilization of genetic resources in order to enhance favorable effect on agriculture, coordination between the main EC actors and organizations around the world concerned with the conservation of animal genetic resources and an effective exchange of information [1].

The actions regarding this purpose are:

- Maintaining the biodiversity;
- Improving the quality of agricultural products;
- Wide diversification in rural areas;
- Cutting down agricultural production costs by promoting sustainable agricultural production;
- Promoting sustainable development in rural areas;
- Improve knowledge of available genetic resources;
- Creating a European network in order to promote the Internet presentation of national inventories, available to the public;
- Broadcasting at communitary and international level the inventory of animal genetic resources preserved "in situ" and "ex situ".

Protection of animal genetic resources in Romania is made by the Ministry of Agriculture and Rural Development, the National Agency for Amelioration and Reproduction in Animal Science "Prof. Dr. GK Constantinescu", in which the service of animal genetic resources conservation and protection operates.

PRESERVATION "IN SITU"

- An in situ preservation measure facilitates the continuity of coevolution in various media of life and avoidance of stagnation for the genetic stock.
- The breeders' interest for certain breed decreases if the level of production no longer ensures operational efficiency, and, as a result, the population is reduced to extinction.

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conservation programs for critically ill, endangered or vulnerable population received financial support from the state budget. Until 2009 – 14 animal species were preserved, this representing 123 pure breeds and lines owned by the 21 member associations.

CATTLE SPECIES

The problem of preserving genetic resources, represented by the unique indigenous cattle breeds as biological and cultural-historical importance, vulnerable and endangered, is subject to a number of 294 heads of copies:

- Grey Steppe – 52heads
- Romanian buffalo-242heads.

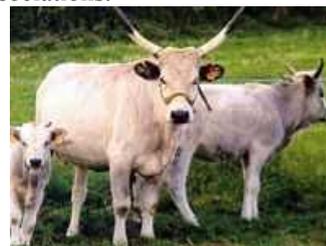
Nominations of new breeds of cattle, which are valuable genetic resources:

- Maramures Brown "Akeratos"
- Pinzgau of Transylvania

GREY STEPPE

It constitutes a valuable biological material due to its adaptability, resilience and capacity in crossbreeding combination with other races, especially Maramures Brown breed.

Milk is qualitatively superior to other races by lack of leucosis and TB infection and males which do not matter in breeding become steers for labo, both in households as well as in associations.



Source: ANARZ

SPECIES BUFFALO

THE ROMANIAN BUFFALO

It grows in areas with poor quality vegetation in some hilly areas and wetlands in Muntenia, Dobrogea and Oltenia. Tradition is well preserved in Brasov, Salaj and Cluj counties. It is grown as milk meat animal, but also for some agricultural work. They grow well on natural or cultivated grazing, adding reduced amounts of mash and corn as feed.



Source: ANARZ

MARAMUREȘ BROWN

It comes from an ancient cattle breeds in the Alps Mountains area, ie Bruna Alpina breed; then they got Bruna breed of Austria; Maramures specimens brought by Austrians settlers led to the birth of Maramures Brown breed;

- It is resistant, it exploits well the alpine grazing feed, and it is improved through selection and crossbreeding with Schwyz breed.



Source: <http://images.google.com>

PINZGAU OF TRANSYLVANIA

Presently it grows in North Carpathians, Apuseni Mountains, south of Transylvania and, less in the NE of Caras Severin.



Source: ANARZ

- It is maintained in the context of biological diversity, as a reserve of genes for some qualities: organic-resistance and adaptability to specific environmental conditions of mountain areas; strong bones and solid limbs, suitable for forestry work.

SHEEP SPECIES

Sheep breeding was an occupation of the Romanian people since the very beginning of its history. The important genetic fund of this species with good adaptability to local natural conditions, competent experts in this area, specific technologies and high professional experience allow rapid numerical recovery of sheep.

WALLACHIA WITH CORCKSCREW HORNS (OAI A RATCA)

It is supposed to have been brought in the Carpathian Basin by the conquering Hungarians in the ninth century.



Source: ANARZ

The horns are in shape of corkscrew. The RATCA breed sheep number is constantly decreasing. Currently, both in Europe and in our country, programs of conservation (preservation) are initiated for the sheep populations that are in danger of extinction.

TRANSYLVANIAN MERINO

Merino West was formed by transformation crossing of local breeds of Western Plain with Rambouillet and Negretti breed rams and, in limited proportion with early-Merino breeds and Hungarian Merino. After 1950, the Stavropol Merino was used and for a limited period the Merino of Palas.



Source: ANARZ

Two ecotypes have emerged, spread on two areas: The Big Type, raised in the plains and the Small Type raised in the hills, with large differences in wool production for the Big Type and higher organic resistance for the Small Type.

MERINO OF PALAS

It was formed between 1920 and 1965.

- It is characterized by mixed production (fine wool - meat), it is adapted to lowland areas with steppe climate, shows high vitality, high capacity in exploiting the food and medium precocity.
- It is more prevalent in Dobrogea and the Danube Plain. Recently, it extended to breeders in other areas: Vaslui, Bacau, Ialomita.



Source: ANARZ

KARAKUL OF BOTOSANI

Approved in 1988 under the name "Karakul of Botosani" grey and black variety.

- it grows in the north east plains of the country, Moldavia and Suceava;
- it is exploited for skin and milk production.
- In 2010 the brown line of the breed was approved.



Source: ANARZ

Currently there are studies working on strengthening new genetic colored sheep lines, gray, pink and white.

BLACK HEAD OF TELEORMAN SHEEP (CARABASA)

Is a mixed breed of milk-meat-wool, and it is part of the medium-weight sheep, especially recommended in the lowlands and less in the hills[2].

- due to its precocity, prolificacy and milk production, rams can be used in industrial or infusion crosses with different local breeds in order to increase milk production and especially meat production.
- It was approved in 2010.



Source: ANARZ

GOAT SPECIES

Growth of goats presents a great socio-cultural importance, being the species that was formed and selected in the sub-Carpathian arc areas and in the south-east plains of the country. Due to the easy growing, it is not such a demanding animal and it has adapted to conditions all over the country being resistant to extreme temperatures. The gene was transmitted from generation to generation accumulating qualities related to disease resistance and extreme temperature.

CARPATHIAN RACE

Is the most common and oldest breed of goats in the country. It comes from goat Prisca and it is characterized by rusticity and resistance, it is primitive and very heterogeneous in terms of color, body development and production. The outside characteristic are those of a late animal, horns being present in most individuals.

The color is white, but there can be also many mixes (different shades of gray, red, white and black).



Source: ANARZ

BANAT WHITE RACE

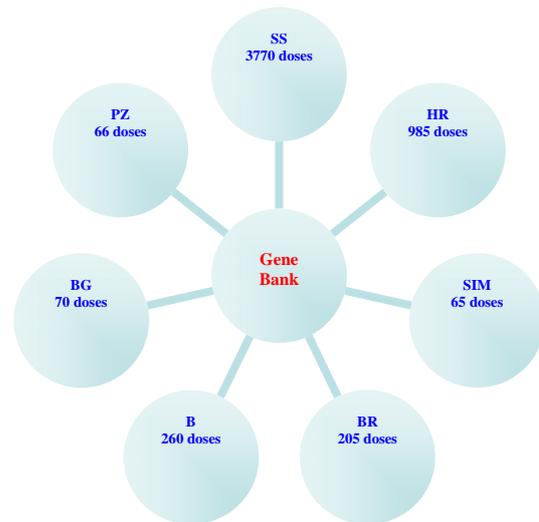
It was formed by crossbreeding of the local breeds with Saanen and German Noble. From this area it has expanded in Bihor, Maramures, Brasov, Ialomita, Constanta and other counties where it is much appreciated. Livestock breed has a share of about 20% of the species. It has a fine-robust constitution and it reaches its sexual maturity at 7-8 months.



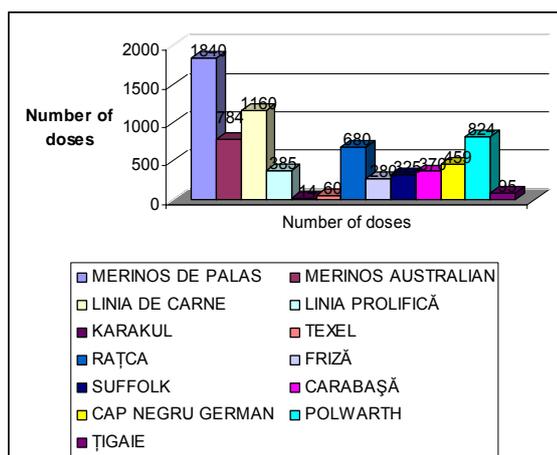
Source: ANARZ

PRESERVATION "EX SITU"

Preservation by cryopreservation of the biological material with critical, unique, risk status and high valuable genetic potential "ex situ", is realized through biotechnological bank of Animal Genetic Resources located at the National Agency for Amelioration and Reproduction in Animal Science "Prof. Dr. G.K. Constantinescu ". It represents the link between the national and international genetic fund, in order to enhance the indigenous populations by infusions of valuable genes. The goal of the biotechnological Genetic Resources Bank is preservation of frozen semen from lines breeds of domestic animal populations with a reduced number less common and endangered, belonging to different species.



Schematic representation of the number of doses cryopreserved for cattle species



Graphical representation of the number of doses cryopreserved for sheep

By analyzing the graph we can see that the highest number of cryopreserved doses are for the gene bank is Merinos of Palas, followed by meat line, and the fewest doses are respectively Karakul breed Texel breed.

Doses cryopreserved for sheep

Nr. crt.	RACE	NUMBER OF DOSES
1.	MERINOS DE PALAS	1840
2.	MERINOS AUSTRALIAN	784
3.	LINIA DE CARNE	1160
4.	LINIA PROLIFICĂ	385
5.	KARAKUL	14
6.	TEXEL	60
7.	RAȚCA	680
8.	FRIZĂ	280
9.	SUFFOLK	325
10.	CARABAȘĂ	370
11.	CAP NEGRU GERMAN	459
12.	POLWARTH	824
13.	ȚIGAIE	95

Regarding goats, in the gene bank there are cryopreserved doses from 5 races, the number of doses ranging from 1818 for breed of milk Saanen to 68 doses for Boer breed, which is a breed of meat

4. CONCLUSIONS

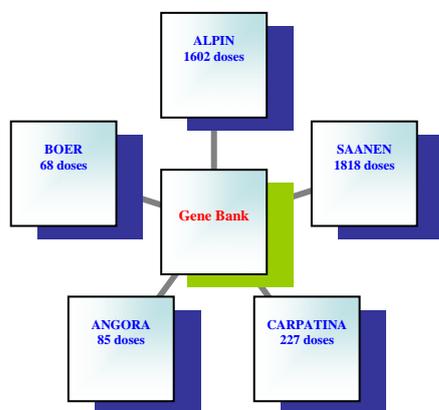
The Ministry of Agriculture and Rural Development with the National Agency for Amelioration and Reproduction in Animal Science "Prof. Dr GK Constantinescu" - is considering financial support for the maintenance and development of these species that are endangered by issuing legislation on European funds to maintain and increase the livestock at risk, creating biodiversity and conservation for these genetic resources in traditional areas of growth.

The purpose of the National Agency for Animal Breeding and Reproduction "Prof. Dr G.K. Constantinescu" is the development and maintenance in good conditions of the national genetic heritage in conservation" ex situ "within gene bank of biological material from livestock breeding value.

The gene bank is a link between the valuable genetic background and the government intervention in restocking the populations in danger of extinction.

5. REFERENCES

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Schematic representation of the number of doses cryopreserved for goats