

A MULTIDISCIPLINARY EXPERIENCE ON CONSERVATION OF AnGR IN SPAIN (RESEARCH GROUP PAI-AGR-218).

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SUMMARY

Here is presented the research group PAI-AGR-218 as an example of organization created for the rescue of the animal genetic patrimony of Spain.

This group count with several conservation herds of those breeds demanded this “ex situ” action. Also we count with four specialized laboratories to complete all the possible demands of the local breeds and varieties for their conservation and reintroduction in the market. The laboratories of Quantitative Genetics, Molecular Genetics, Assisted Reproduction and Technology of the Products work in this way.

We are showing the philosophy of the group, the material and human resources disponibles, and the projects going on.

INTRODUCTION

The conservation of the Domestic Animals Genetic Resources is a complex process what demands a multidisciplinary focus to get positive and efficient responses.

Spain as other Mediterranean countries has a great quantity of animal biodiversity and a clear integration of this biodiversity in the cultural and social patrimony of the Autonomous regions forming the present Spain. This is facilitating the disposability of funds to develop conservation and improvement plans of local breeds very integrated in the high variety of Spanish ecosystems.

In this picture, the Southern region of Andalusia count with a multidisciplinary team of researchers centered in the genetic management of the Andalusian breeds, the Research Group “Improvement and Conservation of the Domestic Animals Genetic Resources” located in the University of Córdoba and funded by the Andalusian Research Program (PAI) is heading the Animal Conservation in this country.

This team is acting in Research, Development, Innovation, Transference, Formation and Interaction with the administration in all the domestic species, always in the genetic management of local breeds.

Presently the structure of the group is organized in four main sections, the Applied Quantitative Genetics; the Applied Molecular Genetics, The Applied Assisted Reproduction and the Technology of Products.

This structure try to assist the farm sector in all subjects linked to the competitiveness of the local breeds. Firstly the characterization is our objective until the official recognition of the populations as breeds or varieties. Secondly we organize the genetic management of these populations organizing and maintaining the herd books and the improvements or Conservation plans depending of the circumstances. Thirdly we use the assisted reproduction techniques to create germplasm banks (semen and embryos) to support the “ex situ” conservation and the breeding programs. Finally we support the characterization a valuation of the traditional products of the local breeds, defining and characterizing them and divulgating their characteristics.

These laboratories are complemented with herds of conservation maintained in collaboration with the provincial Government of Córdoba, just in those breeds

demanding of this “ex situ” action not only to guarantee the survival of the population but also their cultural aspects in front of the human eyes.

In the present contribution the four laboratories integrated in the group will be described together with their activities, material and human resources, but specially the common philosophy to work in the conservation and rescue of the local breeds of Spain.

APPLIED QUANTITATIVE GENETICS

This section is coordinated by Dr. J.V. Delgado, counting Drs. M. Benavente, F. Padilla, J.M. Flores, A. Redondo Villa, C. Barba, M. Magallanes and the postgraduates J.M. León and L. Jimenez.

This team design conservation and improvement programs based on the Quantitative Genetics. They develop the genetic valuation of candidates as reproducers and interact with the breeders associations. Also they research demographic structures of the populations, specially the tendencies of the population inbreeding and effective founders, but also the genetic parameters of selection criteria (meat, milk, wool, skim, morphology, behavior, etc).

For that the Laboratory count with sufficient hard and soft ware to assist the Andalusian breeds. We direct the improvement plans of Segureño, the Mallorquina, the Menorquina, the Red Mallorquina and the Canary Wool-less sheep breeds; the Marismeña cattle breed, the Murciano.Granadina goat Breed, the Andalusian hound dog breed and the Spanish-Arab horse breed.

Also we direct the conservation program of the Ibicenca sheep breed, the Andalusian Black Cattle Breed, the Utrerana, the Retuertas Horse breed, the Andalusian Blue and the Andalusian fighter chicken breeds; and the Spanish bees.

We collaborate in some aspect of the breeding programs of the Malagueña, Mountains Andalusian White, Celtiberic White, the Florida, Majorera, Tinerfeña, Palmera goat breeds; the Spanish French Merino, the Spanish Merino, The Spanish Fleischaf, The woolled Canary and the Palmera Sheep breeds; the Palmera and the Canaria cattle breeds, the Iberian, the Chato Murciano and the Black Canary Pig breeds.

APPLIED MOLECULAR GENETICS

In this subject our work in centered in the use of the microsatellites information to characterize the genetic profile of the animal populations, also determining the genetic relationships among populations. These markers have been internationally recommended to characterize the animal populations by prestigious organism such FAO and ISAG.

The Laboratory is small but complete. We count with three automatic sequencers (ABI), a Managing Robot and eight termocycler.

Our laboratory already collaborates with other national and internationals institutions, exchanging information and participating in comparison test.

This team is directed by Dra. A. Martínez, counting as well, with Drs. J.L. Vega-Pla, J. Quiroz and the postgraduates R.Vázquez, A. Villalobos and Vincenzo Landi.

Apart the work on characterization in all the domestic species, this team gives support to the genetic management plans in the verification of paternity and maternity, traceability of products, the individual assignment, and the animal/germplasm identification

APPLIED ASSISTED REPRODUCTION

Our laboratory of assisted reproduction it is also small but complete. We must stand out the presence of two automatic crio-freezers, one fixed and the second portable. It permit us to develop semen and embryos extractions just in the Laboratory or displaced to the farms.

Presently we have germplasm collections of almost all the domestic populations under study. Some of these collections have conservation purpose in the form of closed germplasm bank. In this case we have duplications kept in the National Germplasm Bank located in Centre of Reproduction and Selection (CENSYRA) in Colmenar Viejo (Madrid).

Other sets of germplasm are open and participate in the activities of the conservation or improvement plans. They are applied in the genetic connection of herds, the diffusion of the genetic progress, the genetic commercialization and the control of the inbreeding by mean of the directed mating.

The head of this team is Dr. A. Cabello, counting with the support of Dr.J. Pelaez, and the posgraduates A. Vallecillo and M. Miró and two assistants E. Doctor and F. González.

TECHNOLOGY OF PRODUCTS

Once the populations are characterized and officially recognized, when they are organized under an association of breeders, with a right genetic management in the herd book and the breeding program, only rest to improve the competitiveness of the traditional products coming from the local breeds or varieties.

Sometimes the rescue of the breed only depends of its reintroduction in the market valuing its products.

With this purpose we have recently complemented the research group with some specialist in the characterization of products, with a view to differentiate it with respect to those obtained from international breeds and conventional management systems.

In this way we have developed a laboratory for the work on milk, meat, wool and skim. This is our youngest team, so we are permanently increasing its resources. By now we have worked in the characterization of the meat and carcass of kids, lambs and calves; also we have worked with milk qualitative characteristics as in quality of local cheeses. Also we have worked in collaboration with Brazilian and Mexican teams in the characterization of the wool of local sheep and the skim of local goats and sheep.

This team is directed by Dra. M.E. Camacho, counting with the support of Dra. F. España, M. Fresno and the postgraduates P Zurita, S. Rey and M.A. Revidatti.

HORIZONTAL ACTIONS

In this aspect we must stand out some actions developed horizontally among all the mentioned teams.

Firstly we must make a mention to Innovation. we have developed a molecular tool recently patented, used in the breed traceability of the Iberian Pig products. Also we have to point out a new diluent for horse semen crio-conservation also developed by our team and in process of patent. These are good examples of the innovation developed by our team.

In Formation, we have organized a Specialization Training Course (210 teaching hours) directed to the Latinamerican scientific community. Presently we have developed eight

courses with total of 200 researchers already formed. Also we are rescuing the traditional knowledge linked to the local breeds and traditional management systems under the subject EtnoZootecny.

The transference is developed by mean of more of 20 contracts with private enterprises to stimulate the use of local breeds, sustainable systems and traditional products in the creation of richness (rural development).

Finally, the Interaction with the administration permit as to steer the regional and central government in all subjects related to the local breeds. A good example was the redaction of the draft on the National Inform in the Global Program of FAO, but also the redaction of several laws and regulations to conserve and preserve the animal patrimony of Spain

CONCLUSIONS.

- 1.- Ark and rescue of the domestic animal populations (breeds and varieties) demand of multidisciplinary actions to get the maximum efficiency.
- 2.- The conservation and improvement plans of local populations must be supported by the molecular genetics and the assisted reproduction in some subjects such as characterization, “ex situ” conservation, genetic connection of herds, control of inbreeding, etc, where these modern tools are indispensables.
- 3.- The experimental herds are essential as a point of reference for the private herds. They are the genetic reserve, but also the cultural memory of the population.

DIAGRAM

