

Report

FAO-EAAP-ERFP Workshop on “National legal and institutional arrangements for ex situ conservation of animal genetic resources”

23-26 May 2012, Hotel Allegra – Zagreb – Croatia

23 May Session I – plenary

Welcome and opening

- J. Ramljak – University of Zagreb
- Prof. Jacopovic – Ministry of Agriculture
- Prof. Mesic – University of Zagreb
- ERFP (S.J. Hiemstra)
- FAO (P. Boettcher)

This workshop was made possible by kind contribution of ERFP, FAO and the host in Zagreb. 48 participants from 30 countries are present.

Introduction to the Workshop Programme – objectives of the ERFP WG Ex Situ (Sipke -Joost Hiemstra)

Objectives of the workshop

- exchange experiences
- support and establish AnGR Gene Banks
- develop a European strategy for gene banks
- discuss the legal framework – ERFP website now hosts a special site for ex situ conservation
- co-ordinate European Gene Banks
- exchange experiences on the use of CryoWEB

Expected output

- Workshop report (rapporteur B. Berger and E-M. Stålhammar)
- The 4-page summary reports on the ERFP website from each country
- Pdf copy of powerpoint presentations on ERFP website
- Draft discussion paper/position about the European Gene Bank Strategy
- Report of users of CryoWEB

Croatian National Action Plan and Operational Plan to Establish AnGR Gene Bank in Croatia (Jelena Ramljak and Ante Ivancovic)

Addendum: CRYO-IS HR data entry (slide 16): One person will be responsible for data entry into CRYO-IS HR.

Questions: How many people were involved in the process? How much money will it cost? – Will be discussed later.

Session II – plenary – Legal/institutional arrangements for *ex situ* conservation at national level

All the presentations and the 4 pages summaries can be found on the ERFP web page.

Bulgaria (Valentin Georgiev)

The Bulgarian National Council consists of NGOs. Who established it and declared it to be the National Council? EARSRAB organised the council on basis of the Animal Breeding Act.

Czech Republic (Vera Matlova)

The National Program was developed and supported by the Czech Ministry of Agriculture in 1996 only for national breeds. No EU-funding.

ABS for Czech gene bank material: Provider and recipient are subject to Czech law.

Norway (Nina Sæther)

All gene bank activities are on a private basis. There is no involvement of the government in Norway.

Germany (Martina Henning)

Kick off for German National Gene Bank. The necessary decisions are made, the approach will be project based and start with chicken. The model is the Gene Bank of Saxonia – collection of endangered AnGR, in situ – breeders get subsidies, material is the property of the state.

Portugal (Antonio Horta)

Gene bank for native Portuguese breeds in place since 2004. Semen, embryos, oocytes and DNA of cattle, sheep, goat and pig. Headquarters is no AI-centre.

Current problems: Funding, no duplicate collection.

Serbia (Miroslav Marinkovic)

No official program for *ex situ* conservation and no gene bank yet, three commercial AI-centres for cattle and pigs. AI-centres started to keep back-up collection of their material recently.

Spain (Fernando Tejerina)

The regional governments (17) deal with the breeds located mostly in their territory.

National gene bank in place as duplicate collection of the breeders organisations collection. All material EU-conform, owner of the material is the breeders organisation. National derogation for endangered breeds, “breeds with difficult handling” (fighting bulls) and germplasm with destination to gene bank in place.

Ukraine (Svetlana Kovtun)

Gene bank owned by the state. Semen/oocytes, embryos, DNA of native and improved breeds. New conservation technology using nanomaterials – research project.

France (Delphine Duclos)

The French Cryo-bank consists of 12 partners (official and commercial). Collection of semen, embryos and somatic cells. 3 categories: Rare breeds, exceptional animals of improved breeds not used as breeders, selected breeding stock. Most material fulfils EU-regulations. A possibility is the use of secure straws for other material.

Question: Is material from overseas territories included? The sanitary status of the material is a big problem not solved yet.

24 May Session II – plenary cont.

Poland (Jacek Sicora)

National cryo reserve in place since 2004. Storage place is the National Research Institute of Animal Production. Only material fulfilling national/EU sanitary regulations: semen, oocytes, embryos. Data of the collected material currently only on paper. Electronic storage planned.

Question: Who is the owner of the material? Owner is the National Research Institute of Animal Production.

24 May – Session III – plenary

Sub-regional and transboundary challenges and opportunities for gene banking – Slovenia, Austria, Croatia (Angela Cividini, Beate Berger, Jelena Ramljak)

Nine (9) rare transboundary breeds are identified in the 3 countries but not all breeds are present in all 3 countries. Austria and Slovenia have an official national gene bank, Croatia has established the framework to start a national collection.

Challenges are the cross-country preservation of cryo-material, the import and export of cryo-material and live breeding animals, the different levels of characterization in the countries (phenotype, performance, molecular), historical review of the origin of the breed and veterinary legislation.

Opportunities are the cross-country housing of duplicate collections, research e.g. genetic distance between populations of the breeds in different countries, co-operation of breeding organisations and the public and private sector. Multiple benefits and side-effects for breeders and the promotion of breeds are identified.

Questions and discussion

Paul Boettcher: Until now only independent actions have been taken in the 3 countries?

Yes, with the exception of the Turopolje project (Austria, Croatia, Serbia, Bosnia) 2009 to 2011 identifying the populations in the countries and trying to find a way to exchange breeding material. Currently no exchange possible because of veterinary status of the herds.

Gustavo Gandini: Try to reduce costs for transboundary conservation through a common conservation goal? That would depend on the legal framework and veterinary costs. Slovenia has no approved AI centre for small ruminants. Currently experts come to Slovenia and collect the material on farm.

Elzbieta Martyniuk: Did you use the FAO criteria for categories of endangerment or national criteria. No FAO criteria, national categories.

Gene banking in Benelux: overview and transboundary collaboration opportunities (Jean-François Dumasy, Jeanne Bormann, Sipke-Joost Hiemstra)

An overview over the gene banking situation in Belgium and the other Benelux countries is given. The type of material in, content, sanitary and legal status of the gene banks differ widely.

Currently collaborations exist concerning exchange of information, legal issues and a project of Belgium and France to conserve semen of a rare cattle breed (“Bleue mixte”).

Opportunities for collaboration are identified like further exchange of research results and information, future use of CRYOweb in Belgium, joint conservation of transboundary breeds and research collaboration.

Questions and discussion

Asko Mäki-Tanila : Are there discussions about the “country of origin” (EU-legislation) of a transboundary breed?

No, they are not listed as transboundary breeds and there is no discussion about country of origin.

Comment of Sipke: If there is a joint country of origin, there is a joint responsibility for the breed.

Sub-Regional-Transboundary Opportunities for Gene Banking (Lithuania perspective)
(Rūta Šveistienė)

In the Baltic states Lithuania, Latvia and Estonia there is currently no co-operation between gene banks, all breeds are treated as separate breeds and considered as transboundary breeds.

Phenotypic similarities may hint at a common genetic basis.

The Swiss gene banking model - perspective and role of Swiss breeding organisation(s) (Fritz Schmitz-Hsu, Catherine Marguerat)

In Switzerland is Swiss Genetics responsible for the National Gene Pool. The company provides the cattle semen for the Gene Pool and updates the database. Insofar the model is similar to the Norwegian model, only there is no on-farm collection in Norway. The Federal Office of Agriculture provides the system of administration (CryoWEB, training, etc.). The non-cattle part of the National Gene Pool (horses, goats) is owned by the Swiss Confederation. Billy goats are now shipped to France and the semen is collected there but there are sanitary problems to bring the bucks back to Switzerland. A broadening and inclusion of pigs and sheep is planned. Currently the inventory of the existing cryo-reserve and uploading of data into CryoWEB is under way.

Questions and discussion

Zhivko Ducheve: There were problems bringing the billy goats back from France. This will limit the willingness of breeders to contribute to the gene bank.

A different solution for collection of goat semen has to be found.

Asko Mäki-Tanila: How is the situation of HF-cattle in Switzerland?

HF is about 30% of the Swiss cow population, crosses excluded. The population of Original Brown (without Brown Swiss blood) now is about 7000 cows in the herdbook.

Vera Matlova: How is the semen collected on farm stored?

It is stored separately from semen from AI-centres meaning in different tanks and in a different room.

Introduction to CryoWEB and state of implementation in Europe (Zhivko Ducheve)

CryoWEB is an open source web-software intended to serve as an electronic register of the national collections, uniformly applicable across various species, types of genetic material or storage facilities. It was developed in the Institute of Farm Animal Genetics (FLI) in Germany as part of the EFABISnet project (<http://efabisnet.tzv.fal.de/>). It can be downloaded for free from the project homepage <http://cryoweb.tzv.fal.de/>. This homepage serves as a platform for users to exchange experiences and disseminate information. An overview over the functions of CryoWEB is given.

During the EFABISnet project CryoWEB was installed in 10 partner countries. Additional installations in 6 other countries were done. Three cases of use of CRYOweb are identified: Countries with

operational gene banks, countries just starting a national gene bank and linkage of sub-regional gene banks (Italy, Finland).

Discussion

Some countries have added fields to the CryoWEB containing additional information. A field about the legal status of the material could be useful.

24 May Session IV – plenary

Latest developments in cryobiology and reproductive technologies (Henri Woelders, Sipke -Joost Hiemstra)

Semen

Birds – duck semen collection more difficult than chicken but a working ejaculation technique is established. Cryo-conservation of poultry semen (chicken) gives high post-thaw fertility rates.

Non-surgical methods for intra-uterine insemination of sheep with TG-semen were investigated. The “Norway approach” (natural oestrus, vaginal or cervical insemination) seems to work best.

Embryos/oocytes

Cryopreservation of horse oocytes (or embryos) is very difficult. A PhD project is set up.

Ovaries of mice and birds

Grafting of lyophilized ovaries or even parts of ovaries works nicely in these species.

Storage of somatic cells by CGN is currently not accepted by the Dutch government.

Questions and discussion

Eildert Groeneveld: How practical is grafting of ovaries? It works well in the lab but is not usable on farm. 22 inbred strains of laboratory mice were conserved by lyophilisation and re-grafting of ovaries. In birds it is very easy – just place the ovaries in the right place and they will work.

Svitlana Kovtun: Is grafting of ovaries applicable in pig breeding?

In adult animals of other species it is more complicated than in mice. Small parts of ovaries may work but at the moment the method is no real option.

Cost-effective conservation programs – Somatic cells (Eildert Groeneveld)

Easy method to acquire diploid cell material. Tissue samples (ear clippings) are put in a storage medium in vials and stored in liquid nitrogen. Cheap, no big investment in equipment necessary.

Revival of samples may be expensive, difficult and insecure – establishment of cell lines, cloning, etc.

Works well as an emergency method. Please be aware that the conservation procedure is different from sampling for DNA analysis. Legal issues about ownership have to be solved before collection.

AnGR Biobanks – genomic research and breeding perspective (Eli Grindflek)

Norsvin, the Norwegian pig breeding company, is a member of the BioBank for livestock and fish.

DNA samples of 8 species and more than 30 different materials are stored. The main purposes of the Biobank are use in the breeding programs (paternity testing, marker genes for selection, genomic selection) and research (linking production and product data with data from GWAS and QTL mapping).

Questions and discussion

Elzbieta Martyniuk: Do you check all cows for genomic selection?

No, from a pre-selected sample of 5000 candidates about 1 – 2000 are tested.

Sipke-Joost Hiemstra: Is the Biobank private? Yes, it is a private company.

How does the customer get access to the material? The owners of the material are the breeding company but everybody can be a customer. The Biobank is only the holder of the material and responsible for the storage.

25 May Session V – plenary

AnGR Gene Banks – FAO perspective (Paul Boettcher)

FAO's Guidelines are in print and also available online. About 50 countries are actively developing a national strategy action plan. Less than 20 % of the countries in the world have a national gene bank.

Questions and discussion

Gustavo Gandini: The sanitary rules in the Guidelines apply only to non-EU countries. EU has its own legislation and sanitary rules.

Sipke-Joost Hiemstra: Should DNA be included into Gene Banks? FAO says yes, this may become very important in the future. Best approach is to combine germplasm and DNA sampling strategy.

ABS-Issues (Elzbieta Martyniuk)

Currently there are inconsistencies between TRIPS and the CBD/Nagoya Protocol.

Questions and discussion

Where do we get the analysis of the questionnaire of the Commission?

A short report is available on the homepage of the Commission together with all responses received (43).

How can we access information on the exchange of AnGR between European countries?

Some sources are EUROSTAT, some data come from NGOs but not all analyses are available. It is difficult to distinguish between livestock sold for slaughter and breeding animals.

In the biodiversity issues the DG Environment is the only DG involved.

We should get a wider perspective – what will be in 20 years? If access to material should be easy for one breed why not for others?

Cryobanks as BRCs: The French CRB-Anim infrastructure project and prospects for setting up an European network for such BRCs (Michelle Tixier-Boichard)

Questions and discussion

The distribution of samples from the collection – is there a positive list for the committee? How do you evaluate requests for access – is there an effort to evaluate?

“Positive list” – so far samples have only been provided for scientific purposes. Usually scientists contact CRB before the start of the project.

The EU-horizon 2020 – how to get on the agenda?

Contact your representative to ESFRI –European Science Policy Network a network of existing infrastructure. Which volume of infrastructure? Could be e.g. a PCR-system for the node.

25 May session VI – subgroup I CryoWEB

Zhivko Ducheve (chair)

CryoWEB is an open source software – please feel free to improve it!

Policies and reports on updating and uploading of data

Possible rules for entering information in a transboundary CryoWEB

Improvement and further development of CryoWEB

Policies and reports on the use of CryoWEB

Austria (Beate Berger)

Switzerland (Fritz Schmitz-Hsu)

Germany (Martina Henning)

Netherlands (Ina Hulsege)

Slovenia (Angela Cividini)

Entering information – rules within countries. Always establish policies before you start to work and store the information in a safe place. As you encounter obstacles needing new decisions, make them and add the information to the established rules. Clean the data before entering. In all the reporting countries only a few persons are responsible for data entry into CryoWEB. Dealing with obstacles, errors, unclear or missing data - *“A lot of work but so far we encountered nothing that cannot be solved”* (Fritz Schmitz-Hsu).

Italy (Gustavo Gandhini)

Use of CryoWEB in Italy differs from other countries. CryoWEB is the “virtual cryobank” to share information between the Italian regional gene banks. The “contacts” are the partners (gene banks) who are not necessarily the owners of the material.

Problem: Owners of the material do not want to publish sensible data.

Wish: Possibility to create a report per partner, report per location within each partner, per partners within a location (excel-files).

Possible rules for transboundary solutions

- for a regional solution a different approach is needed. Owners of the material (e.g. private AI-centres) will not agree to publish sensible data on the internet. Outputs like in national CryoWEB will not be accepted.

EFABIS currently holds the information that material of a breed is stored in a country. This is only a total and not enough for a transboundary breeding program. For further information the NC of the country could be the contact person.

Improvement of CRYOweb

Ina Husegge: A lot of information in our CryoWEB goes into the “comments” field e.g. number of straws/dosis (horse semen). A query for this field would be useful.

Wishlist for the improvement of CRYOweb

- additional fields
- legal status (ownership, individuals, organisations)
- production method, veterinary status (for searching, EU compatible)
- number of straws / portion -- required for a report

inputs improvement

- type ahead: sire and dam; contacts, donor,
- length of animal ID field

outputs:

- sorted by material
- species/breeds/number of animals (Ina)

Additional fields are always a problem, not everybody needs the same information. The possibility of incompatible data structure arises. A lot of these problems could be solved creating the possibility of a CSV export file.

“Transboundary” issues:

- breed total in EFABIS (does not include number of donors, not enough information for common breeding program)
- merge such data above CryoWEB ?

Make a list of the transboundary breeds and what data the users want to share.

CRYOweb user group

- implementation, disseminate, cvs
 - use mailing list
 - subscription? find out, how some 'little' funding can be organized. Think about possible (small) funding and get together on mailing list?
 - think about making transboundary issue an ERFP project and put the CSV output etc. into it
- Think about proposals and come back on the project issue in Bratislava!

25 May Session VI – Subgroup II European gene bank strategy and framework

Sipke-Joost Hiemstra (chair)

Opportunities and challenges for a cross-border and pan-European Gene banking strategy

Questions:

- Beyond national interests and responsibilities, what should be transboundary or pan-European **objectives** related to cryopreservation/bio-banking of AnGR?
 - For each objective:
 - From what perspective?
 - Need for action? By whom?
 - Expected benefits? For whom?
 - Bottlenecks?
 - Tasks for ERFP-WG-Ex Situ?
- Open discussion, think ‘out of the box’
- Long term perspective
- First step towards strategic position paper of ERFP-WG-AnGR

Background

1. Why do we need gene bank network from the perspective of livestock sector, research, breeders, diversity, conservation on the European level?
2. We need to convince the European citizens about the importance of gene banks.
3. Need for capacity building and support for countries and the advantage of cooperation.
4. Opportunities for development of the technology
5. Link to in situ conservation and EU sustainable rural development objectives

Current situation of gene banks in Europe

There is a lot of information, material and research projects but fragmented. Therefore an overview about the work of the different national gene banks is needed. Investigate the link between gene bank, biobank and BRC framework. There is a need for improvement of coordination building on previous projects.

General objectives are

1. Increase efficiency of gene bank operations across countries
2. Enhance the fulfilling of the conservation objectives and have a good representation of species diversity in all countries
3. Facilitate that all genetic material in the countries is preserved, full coverage of European region
4. Development and sharing of technologies
5. Facilitate the access to AnGR (incl. information about AnGR)
6. Prepare for implementation of provisions of Nagoya protocol
7. Promote the use of AnGR for scientific purposes and socioeconomic exploitation

Actions to be taken by the WG

1. Prepare an overview of existing gene banks and biobanks as potential members of the network.
2. Create a list of transboundary breeds to avoid unnecessary effort (see mail from Paul Boettcher).
3. Make an inventory of the current information about gene banks (incl. STMA, technological research and development) and state of collections.
4. Collate a list on current descriptors of the participating gene banks to identify common descriptors.
5. Agree on common descriptors of the resources to allow exchange information between the different databases.
6. Assessment of different options for the future European gene bank structure.
7. Preference for decentral “virtual” gene bank network?
8. For transboundary breeds a more “physical” gene bank cooperation is required?
9. Setting the requirements for data exchange through a portal.
10. Identify obstacles for European gene bank structure.
11. Lobby for funding opportunities and policy changes if needed at the EU level together with research institutes and the livestock sector.
12. Prepare a project proposal for funding by the EU.