EFABISnet – An integrated network of decentralized country biodiversity and genebank databases

The aim of the project

- Setup of decentralized national inventories of animal genetic resources in 12 countries
- Establishment of decentralized national inventories of national gene bank collections in 10 countries
- Development of permanent management structure of the European network of animal genetic resources
Consortium members

- EAAP (Coordinator)
- FLI – Germany
- FAO
- EAU – Estonia
- RIAP – Slovak Republic
- CONSDABI – Italy
- UNIMI – Italy
- UNIBFLJ – Slovenia
- ARI - Cyprus
- DLO – The Netherlands
- MTT – Finland
- DEFRA – United Kingdom
- HBLFA- Austria

Outside EU:
- LBHI – Iceland
- FOAG – Switzerland
- GNAAP – Georgia
What is EFABIS?

- A register of domesticated animal breeds
- A repository for documents related to the management of AnGR
- A contacts folder for the National and Regional AnGR Coordinators
- An advanced information and communication tool
Translated in many languages
What is CryoWEB?

- Documentation system for national genebank inventories
- Minimal required data set for ensuring usability of the material after many years
- Options to enter also specific data
- Restricted access to sensitive data
Data collection

Animal record

- species and breed
- source organization of animal
- unique animal ID
- unique ID of sire and dam
- date of birth or year of birth
- sex of the animal
- GPS coordinates of animal
- comments
Data collection

Material types / Vessel types

- Material types may be
  - semen, oocytes, embryos
  - somatic cells, blood, DNA

- Vessel types may be
  - straw, tube, ampule
  - vial, filter paper, ..
Data collection

Generalized Storage Hierarchy

- Samples are considered products of animal
- A 5 level hierarchy
  - storage location
  - tank or freezer
  - canister
  - box
  - cell

should be sufficient to deal with any situation
National Genebank Management

Application Architecture

Web Browser

Linux Server

Templates

CGI scripts

Apache2 Web Server

PostgreSQL Database Server

APIIS framework

CPAN Perl Modules

XML Model File

http Ajax
National Genebank Management

Implementation

Animal Management
The setup after EFABIS project

- EFABIS – Mariensee, Germany
- Poland pilot national database – Balice, Poland
- DAD-IS – FAO, Rome
EFABISnet installations in partner countries

Installations in:
- Austria
- Cyprus
- Estonia
- Finland
- Georgia
- Iceland
- Ireland
- Italy
- Netherlands
- Slovakia
- Slovenia
- Switzerland
- United Kingdom

The plans were fulfilled more than 100% – extra installation in Finland
What is EFABIS II

Breed Data Sheets
Schleswiger Kaltblut/Horse/Germany

Breed names

- Most common name: Schleswiger Kaltblut
- Language: ger.
- Transboundary or brand name: Schleswig Coldblood

Breed local names

- Other name: Slesian Coldblood
  - Language: eng.
- Other name: Schleswiger
  - Language: ger.

Images

Schleswig Kaltblut stallion.

Year: 1995
Gender: male
Photo credit: Prof Hans Hinrich Sambraus; 4304506
Locality:
Why describe production environments?

- facilitate meaningful comparisons and evaluation of breed performance
- obtain data that can serve as proxies for adaptedness
- contribute to evidence-based approach to decision-making
- complement other sources of breed-related information
- allow comparison of internationally standardized data
- allow analysis of AnGR in relation to other domains such as disease outbreaks, poverty levels ...
- prerequisite for modeling the impact of climate change on AnGR
Framework for describing production environments

Production Environment Descriptors

Management Environment
- Management Intervention
- Socio-economic Characteristics

Natural Environment
- Climate
- Terrain Features
- Disease, Parasite and Disease complexes

entered by National Coordinators
prepared GIS layers
Production Environment Descriptors

Management Environment

- Livestock production system type
- Level of confinement
- Climate modifiers
- Disease & parasite control
- Feed & water availability
- Reproduction strategies

Socio-economic characteristics

- Market orientation
- Market targeted
- Main uses and roles
- Gender aspects

Disease, Parasite & Disease complexes

- Diseases
- Ecto-parasites
- Endo-parasites
- Other known threats including: feed + water toxins, predators and other harmful animals

Climate

- Temperature
- Relative Humidity
- Precipitation
- Wind conditions
- Day Length
- Radiation

Terrain Features

- Elevation
- Slope
- Soil pH
- Surface conditions
- Tree cover
Implementation in EFABISnet/DAD-IS

- edit/reshape polygon
- zoom in/out
- reset view
- set focus to polygon
EFABISnet was even extended…

…and two more national databases were set in Greece and Hungary.
The rest of the EU countries?

They have access to enter data directly in EFABIS or DAD-IS and read data from each of the existing databases.
National genebank documentation systems - CryoWEB

Installations in:
- Austria
- Estonia
- Finland
- Georgia
- Greece*
- Iceland
- Italy*
- Netherlands
- Slovakia
- Slovenia
- Switzerland

* - additional installations

Currently CryoWEB is being installed in United Kingdom
Current development

- Geographic information system module for distribution of the populations
- Production environment descriptors module
- Linking the breed performance data to a production environment
- Installation of CryoWEB in United Kingdom
Dissemination activities

The project results are regularly disseminated to a wide audience of scientists, farmers and general public on international conferences and workshops, including inter alia:

- 5\textsuperscript{th} biennial conference of the European federation of IT in Agriculture (EFITA)
- 59\textsuperscript{th} and 60\textsuperscript{th} Annual Meeting of the European Federation of Animal Science
- 13\textsuperscript{th}, 14\textsuperscript{th} and 15\textsuperscript{th} ERFP Annual Workshop
- Conservation of livestock genetic resources by utilisation workshop
European added value

- Increased data quality of the European breeds register
- Wider dissemination of the national genetic resources information on regional and world level
- Access to the information in many languages - broader target group
- A “reference” for educational purposes and creation of awareness
European added value II

- Defined a minimum data set for proper management of national gene banks of cryogenic material
- Uniform software for gene bank documentation
- Aggregated inventory of the European gene banks in the regional breeds register
- Towards uniform documentation system in Europe
Sustainability

- National nodes set in scientific institutions and ministries with permanent personal
- Cooperation between EAAP, ERFP and FAO
- Under the supervision of the national coordinators of management of AnGR
Thank you for your attention!