Farm animal genetic resources
EU initiatives and funding - 7th Framework Programme for Research

GLOBALDIV workshop
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Scientific Officer, Directorate General for Research, European Commission

Commission services involved in Animal Genetic Resources (AnGR)

- SANCO (zootechnics, animal health)
- AGRI (CAP)
- RTD (research)
- DEV (FAO-issues)
- ENV (CBD)
Why harmonised zootechnical legislation?

- National legislation strengthening the home breeding sector (entry in herdbooks, acceptance for breeding) created trade barriers.
- Harmonisation at EC level to break up trade barriers.
- Member States shall not restrict trade and acceptance for breeding of ‘pure-bred’ breeding animals.

EU-zootechnical legislation in connection with AnGR

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<table>
<thead>
<tr>
<th>bovine</th>
<th>pigs</th>
<th>sheep/goats</th>
<th>equidae</th>
<th>other animals</th>
</tr>
</thead>
<tbody>
<tr>
<td>pure-bred</td>
<td>hybrid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directive</td>
<td>77/504</td>
<td>88/661</td>
<td>89/661</td>
<td>90/427</td>
</tr>
<tr>
<td>Acceptance for breeding</td>
<td>87/328</td>
<td>90/119</td>
<td>90/255</td>
<td>-</td>
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<tr>
<td>Entering in herdbooks</td>
<td>C.D. 84/419</td>
<td>C.D. 88/501</td>
<td>C.D. 90/255</td>
<td>C.D. 96/78</td>
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<tr>
<td>Performance testing and genetic value assessment</td>
<td>C.D. 86/130</td>
<td>C.D. 89/507</td>
<td>C.D. 90/256</td>
<td>-</td>
</tr>
<tr>
<td>- semen, ova, embryos</td>
<td>C.D. 89/503</td>
<td>C.D. 90/256</td>
<td>C.D. 96/79</td>
<td>-</td>
</tr>
<tr>
<td>Importation from third countries</td>
<td>C.D. 96/509</td>
<td>C.D. 96/510</td>
<td>C.D. 96/510</td>
<td>(C.D. 93/623)</td>
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<tr>
<td>Special regulations</td>
<td>INTERBULL</td>
<td>Data</td>
<td>Data</td>
<td>C.D. 92/216</td>
</tr>
</tbody>
</table>

Definitions

- “pure-bred” linked to herdbook registration
- “breed” used as indefinite legal term

What is a breed?

“A breed is a group of domestic animals, termed such by common consent of the breeders, ... a term which arose among breeders of livestock, created ... one might say, for their own use, and no one is warranted in assigning to this word a scientific definition and in calling the breeders wrong when they deviate from the formulated definition. It is their word and the breeders common usage is what we must accept as the correct definition.”

Jay L. Lush (1948) in: The Genetics of Populations
Breeding organisations I

- officially approved in one Member State
- legal right to be approved if meeting defined conditions
- activity not limited to one Member State
- possibility to refuse the approval of a new organization for a specific breed in case it endangers the preservation (of that breed)

Breeding organisations II

- in charge of breed improvement/ preservation program

- no discrimination among members
  - right to membership
  - breed as certain ‘collective intellectual property’
Entry into herdbooks

- legal right to enter each herdbook for the same breed
- rules for preservation and controlled evolution
  - main section for pure-bred animals (parents and grandparents of the same breed)
  - supplementary section for females = regulated introduction of foreign/unknown genes

Acceptance for breeding (bovine, pigs, sheep and goats)

Member States may not restrict pure-bred ...

- females
- males for natural mating
- untested males for AI within the limits necessary for approved breeding organisations to carry out official testing
- males for unlimited AI after completed testing
Genetic resources in agriculture

Key objectives

- In Situ and ex situ conservation, sustainable use of genetic resources in agriculture in EU and international context
- Establishing a Community programme
- Complementarity with activities eligible under:
  - The Council Regulation on Rural Development
  - The Framework Programmes of the European Community for RTD.

| Food, Agriculture and Fisheries, Biotechnology | Knowledge-based Bio-Economy (KBBE) |

### Selected actions

<table>
<thead>
<tr>
<th></th>
<th>1st Call</th>
<th>2nd Call</th>
<th>Total (2 Calls)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant</td>
<td>3</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Tree</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Animals</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>11</td>
<td>17</td>
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</table>
Financial aspects

<table>
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<tr>
<th></th>
<th>Total EU Contribution in € (2 calls)</th>
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<tbody>
<tr>
<td></td>
<td>€</td>
</tr>
<tr>
<td>Plant</td>
<td>5,860,379</td>
</tr>
<tr>
<td>Tree</td>
<td>1,110,860</td>
</tr>
<tr>
<td>Animal</td>
<td>1,946,478</td>
</tr>
<tr>
<td>Total</td>
<td>8,917,717</td>
</tr>
</tbody>
</table>

The 17 actions:

- 001: Leafy vegetables
- 008: Grapevine
- 009: Forest
- 012: Cattle
- 018: Saffron and Co
- 020: Farm Animals
- 036: Straw and raspberries
- 040: Sheep
- 049: Rice
- 050: Garlic and Others
### Actions co-funded under Council Regulation (EC) No 870/2004

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Number of coordinators</td>
<td>17</td>
</tr>
<tr>
<td>Number of co-beneficiaries</td>
<td>162</td>
</tr>
<tr>
<td>Total number of beneficiaries</td>
<td>179</td>
</tr>
</tbody>
</table>
### Actions co-funded under Council Regulation (EC) No 870/2004

<table>
<thead>
<tr>
<th>Number of Member States *</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of non EU countries</td>
<td>12</td>
</tr>
</tbody>
</table>

* No beneficiary in Luxembourg and Malta

### Rural Development Policy

Council Regulation (EC) No 1698/2005

New programming period 2007-2013 for Rural Development Programmes (RDPS)

Four strategic axes:

**Axis 1:** Increase the competitiveness of the agricultural and forestry sector

**Axis 2:** Improving the environment and the countryside with specific focus on biodiversity, organic farming, high nature value farmland, water and climate change

**Axis 3:** Improving the quality of life in rural areas and encouraging diversification of the rural economy

**Axis 4:** Leader approach
In Axis 2

► Agri-environment payments to rear farm animals of local endangered breeds and to preserve threatened plant genetic resources: Articles 39(1) to 39(4) of Council Regulation (EC) 1698/2005

► New opportunities offered to Member States and regions for specific support for the conservation of genetic resources in agriculture: Article 39(5) of Council Regulation (EC) 1698/2005

Using RDP specific support for the conservation of animal genetic resources. Some examples

Greece

- Objectives: Conservation of genetic resources in livestock farming for promoting the appropriate genetic material in each region for the reinforcement of the livestock sector.
- Beneficiaries: Competent bodies and support structures for breeding programme.
- Support: may cover the administrative cost of book keeping (up to 100%)…, and the cost of dissemination of information.
Hungary

- **Objectives:** Preservation of genetic resources in agriculture: on farm (animal species) and ex-situ, supporting the maintenance of gene banks, rare plants and fungi, repatriation of partridges. Gene preservation assistance.

- **Beneficiaries:** farmers and competent bodies.

Animal Genetics/Genomics in FP6 - examples

- **Network of Excellence**
  - 13 partners
  - Genomics of host pathogen interactions in cattle, pigs, poultry, salmon, sheep

- **Integrated Project**
  - 33 partners
  - Fundamental genomics in pig, cattle and poultry, including pig genome sequencing
  - www.sabre-eu.eu

- **Technology platform**
  - Farm animal breeding and reproduction
  - 75 signatories
  - www.fabretp.org
The 7th EU Framework Programme (2007-2013)
Specific Programmes: Total 53 billion €

- Transnational scientific collaboration
- Integration, pooling of resources
- Transfer of know-how, mobility of researchers and training

EU investment in research has been crucial for:

EU research funding has been crucial for:

- Transnational scientific collaboration
- Integration, pooling of resources
- Transfer of know-how, mobility of researchers and training
Main new elements compared to FP6:

- 7 years: 2007-2013
- Annual budget increased (EUR 5 billion ➔ 7 billion)
- Basic research (~ EUR 1 billion per year)
- Simplification and rationalisation of procedures
- ...
Theme 2: Broad scope

**KBBE - Activity 2.1**
Sustainable production and management of biological resources from land, forest and aquatic environments

**KBBE - Activity 2.2**
"Fork to farm": Food, health and well being

**KBBE - Activity 2.3**
Life sciences, biotechnology and biochemistry for sustainable non-food products and processes

**Activity 2.1: Sustainable production and management of biological resources from land, forest and aquatic environments: 4 AREAS**

- "Enabling" research
  - Micro-organisms; plants; animals
  - "-omics”; bioinformatics; systems biology; tools and technologies

- Sustainable production
  - Agriculture; horticulture; forestry; fisheries; aquaculture
  - Improved crops; plant health; control of pests, disease and other threats

- Optimised animal health, production and welfare
  - Exploitation of genetics knowledge; breeding, physiology, behaviour
  - Control of infectious diseases; epizootics, zoonoses; management of by-products

- Building of the KBBE
  - Tools for policy makers in support of community policy
  - Rural and coastal development; International development
  - Socio-economics and cost-benefits. Farming systems, including non-food
Identification of topics for the annual work programme

Main line approach:

- Identified needs
- European added value
- Contribution to international commitments
- Available budget

Food, Agriculture and Fisheries, and Biotechnology
Knowledge-based Bio-economy (KBBE)

Work Programme Preparation

EC

Advisory Group

Programme Committee

DRAFT WP

Work programme incl. call topics

Other Commission services
Analysis and exploitation of biodiversity is a distinctive part of the sustainable use of biological resources, which can be supported and improved by new tools, in particular ‘omics’ technologies. The purpose is to identify, protect and use biodiversity, either for the conservation of relevant genetic and biological resources particularly in plants and animals (including fish and aquaculture), for improved use for agricultural purposes (e.g. improvement of specific traits for sustainable production of plants and livestock; soil microbiology), or for innovation in varieties and products [...]. The wild relatives of cultivated plants and farm animals provide a reservoir of untapped, potentially important genes for crop improvement and animal breeding programmes. [...] Mechanisms and strategies for the conservation, characterisation and evaluation of landraces of potential significance need to be further developed. Based on a wide range of molecular and genetic advanced technologies, databases and gene banks currently available, further research needs to be conducted with the aim of increasing our understanding of the evolutionary processes that shape the diversity of crops/animals and their wild progenitors. [...] In the frame of International Cooperation the exploitation of underutilised genetic resources shall take into account its potential contribution to poverty alleviation and sustaining rural livelihoods in the poorest countries.

**Expected impact:** Increased knowledge of the mechanisms underpinning evolutionary process along with improved access to biodiversity resources will contribute to increased diversification of crops and livestock, more resilient and diverse agricultural production systems and, ultimately, to more sustainable farming systems. Enhancing biodiversity will contribute to ensuring that agricultural systems are multifunctional, thus performing a range of ecological services.

### Activity 2.1, Sustainable production
**Main line:** Conservation and sustainable use of biodiversity

**KBBE-2009-1-1-03: Optimisation of methods to maintain farm animal biodiversity**

New high-throughput and low cost genomic tools open up new prospects for the measurement, conservation and exploitation of biodiversity in farm animal species, including their wild ancestors, when relevant. [...] Potential to supplement or replace current quantitative methods for the management and definition of optimal biodiversity in farm animal breeding programmes [...] and to inform and develop strategies to provide for cost-effective *in vivo* or *in vitro* conservation of endangered genetic resources. [...] can unravel the genetic basis of adaptation to different environments [...] The project will encompass development of methodologies, tools and models to assist both industry and policy makers and may include work on improved bio-banking technologies. [...] To support efforts in countries with local breeds and extensive farming, in particular Africa[...] Training component to increase the research capacities in the participating developing countries [...].

**Funding scheme:** CP-FP (*max EC contribution 3Mio*)

**Additional eligibility criteria:** SICA – Min. 2+2 among which 1 African ACP.
KBBE-2009-1-1-02: Mining genomics information of small ruminants to generate understanding of the genetic basis of phenotypes important to sustainable production and health

[...] This project will use functional and comparative genomics and, where applicable, in silico analysis, genome sequencing and other tools, to dissect the genetic basis of one or more specified traits related to production and health. The purpose of this project is to assist in the exploitation of the genome sequence by providing analysis of the genome in relation to traits important for health and sustainable production.

**Funding scheme:** CP-FP

**Additional information:** the active participation of relevant partners from United States should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

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**Additional EU funding opportunities for future?**

- **Rural development programmes (DG AGRI)**
- **FP7 Theme 2:** 1 topic on livestock biodiversity in WP 2009 (on-going evaluation of proposals); likely 1 topic for plants in WP2010. Opportunities for future WPs?
- **Biodiversity is part of FP7 Theme 6:** ecosystems (impact of human activities on); unlikely to cover specifically agriculture
- **FP7 ‘Capacities’ Programme:** possible topic on ‘animal genetic resources centres’ in a call on integrated infrastructures or 2010 (on ‘fish’ and on ‘plants’ as well); other FP7 programmes (e.g. people)?
- **ENV:** ‘Life’ programme (habitats and wild species; until 2013)
- **AIDCO:** possible support for specific programmes/projects in developing countries (e.g. knowledge improvement, institutional support, in/ex situ conservation)
EC Web sites...

EU research: www.europa.eu.int/comm/research
Sixth Framework Programme:
www.cordis.lu/fp6/home.html
www.cordis.lu/fp6/food.html
Seventh Framework Programme:
www.cordis.europa.eu/fp7/home.html
Information requests, Europe Direct
www.ec.europa.eu/research/index.pg=enquiries
DG Research Site:
www.europa.eu.int/comm/research/index_en.html
RTD info magazine:
www.europa.eu.int/comm/research/rtdinfo/

Other links

- **DG ENVIRONMENT:**
  - Nature and biodiversity:
    http://ec.europa.eu/environment/nature_biodiversity/index_en.htm
  - Biodiversity action plan:

- **DG AGRICULTURE:**
  - Genetic resources in agriculture:
    http://ec.europa.eu/agriculture/envir/biodiv/genres/index_en.htm
  - Beneficiaries and partners of the 17 GENRES actions:
    http://ec.europa.eu/agriculture/funding/index2_en.htm

- **DG HEALTH AND CONSUMER PROTECTION:**
  - Zootechanical legislation: