Towards self-sustainable EUropean, REgional CAttle breeds

Objectives
The general objective of the proposed targeted action is the development of guidelines and an expert system to support the management of \((\text{in situ} \text{ and } \text{ex situ})\) conservation and regional cattle breed development programmes. It is important to increase self-sustainability of European regional cattle breeds for their contribution to conservation of farm animal genetic resources and for their links with agro-ecosystems, rural cultural diversity and local economics. The partners of this project consider it as an opportunity to exchange experiences and success factors between countries within Europe.

The major objectives of this project proposal are:
- To better understand the factors affecting demographic dynamics of local/regional cattle breeds
- To assess status and organisation of existing cryopreservation programmes, related to those cattle breeds
- To review available methodologies and software which are useful supportive tools for genetic management
- To construct a map of breed development perspectives and to suggest guidelines and actions for successful programmes
- To assist in development of national or cross-border breed strategies towards self-sustainability and a higher profitability
- To exchange state of the art knowledge and ‘good practises’ on conservation and use of local/regional cattle breeds

Cattle genetic resources in Europe: status and developments
During the second half of the 20\textsuperscript{th} century, animal production in Europe became more intensive and specialized. A decreasing number of high productive breeds or breeding lines produces a growing percentage of total animal products. In most farm animal species, a very limited number of breeds is currently widely used. Development of these widely used breeds is generally supported by efficient breeding programmes, logistics and marketing. On the contrary, a large number of domestic animal breeds in Europe is kept in small numbers. Many breeds are endangered, in a critical status, or extinct already. According to the World Watch List of FAO (FAO, 2000), Europe recorded the highest percentage of endangered or extinct breeds (55\% for mammalian and 69\% for avian breeds).

The importance of conservation of between and within breed genetic diversity is widely recognized. Irreversible loss of breeds or genetic variation within breeds is undesirable. Conservation of farm animal genetic diversity is important for economic, social and cultural reasons. International agreements (CBD, 1992) and EU-policies address the importance of conservation and sustainable use of genetic resources. The European and global framework form the basis for national policies related to the management of AnGR and several European...
countries have developed in situ or ex situ conservation strategies, as stated in country reports, which have been developed in the context of the FAO State of World’s Animal Genetic Resources process.

Domestic animal breeds are often accepted as a cultural rather than a technical term. Local, regional or traditional breeds are named by their origin. Breeds are part of agro-biodiversity, of agro-ecosystems and of our cultural heritage. In Europe, from the 18th century a multitude of breeds emerged with distinct phenotypes, often adapted to local environments. Those breeds or landraces were often multipurpose. Since the 1950s, modern specialized breeds have been developed for many generations, originating from local breeds or landraces.

Among other species, cattle are a very visible part of our agricultural cultural heritage. They play an important role in the development and conservation of very diverse European rural areas and are also socio-economically of great importance. Maintaining diversity in cattle genetic resources in Europe is recognized as an important element among rural development objectives and sustainable animal production systems, now and in the future. It is clear that European countries face similar issues or problems, associated with the conservation and sustainable use of local or regional breeds and with the role these breeds play in rural development and socio-economic development of agricultural communities.

Different - complementary (in situ and ex situ) and integrated - strategies are needed to conserve local/regional cattle breeds and develop and promote their sustainable use. The EU and several member countries provide economic incentives (subsidies) to farmers to raise endangered/rare breeds. The objective however should be to reach self-sustainability for these breeds, without or with less subsidies on a structural basis. A combination of production, market and public values should guarantee sufficient profitability of the breed. Many local breeds are already kept for ‘multi-functional’ reasons; others could probably benefit more from such a strategy. Furthermore, several closely related breeds exist in neighbouring countries or other countries in Europe, where enhanced co-operation across countries could support conservation of such breeds or breed groups.

Since AnGR conservation and management have trans-national or cross-border dimensions, it is necessary to enhance European and cross-border co-operation. Sharing experiences and knowledge and further co-operation will result in more effective and cost-efficient actions/programmes towards sustainable use and conservation of AnGR in Europe.

Results of the project
Expected results of the project are:

- A detailed evaluation of 15 cattle breed cases and identification of factors that influence breed dynamics and that determine success or failure in terms of breed self-sufficiency.
- A minimum set of parameters or indicators for the analysis and monitoring of breed dynamics and conservation/breeding programmes
- A detailed evaluation of existing cattle cryopreservation programmes and gene bank collections
- A European wide survey of current ex situ and in situ conservation programmes for local/regional cattle breeds in Europe, based on a minimum set of parameters
- A survey of available methodologies and tools to for the genetic management in conservation and selection programmes
- Options for breed development or guidelines for better management and organization
of breed conservation and development programmes (‘expert system’)

- Strategy documents from breed strategy demonstration cases
- Advice how to modify existing AnGR databases to make them more useful for monitoring of breed dynamics
- Publications of breed case analyses, survey results and proceedings of workshops and meetings
- A strengthened network of partners active in conservation and sustainable use of animal genetic resources, in particular local/regional cattle breeds.

**Actions and alternative plans in case critical steps are not achieved**

The approach of the project, combining ‘in depth’ case studies with a Europe wide survey of status of *in situ* and *ex situ* activities for regional cattle breeds guarantees a valuable outcome of the project. The commitment of the partners and coordinator in the project is high and, if some of the cases appear not to become successful, the project will be flexible to select other cases where necessary.

**References**

This project will build on state of the art knowledge and previous (research) projects in the same area, *inter alia*:

- The previous RESGEN programme has funded project PL98-118 ‘Towards a strategy for the conservation of the genetic diversity of European cattle’, aiming to provide analytical and objective tools to assess the overall level of genetic diversity and the diversity within cattle breeds as a rational basis of conservation efforts. The preliminary analysis of this data show distinct clusters of breeds within Europe and the kinship between breeds across Europe (Eding et al., in preparation). EURECA will not further elaborate on genetic characterization, but will make use of the results of PL98-118 to show the genetic distinctiveness of breeds or the relatedness with other breeds.

- The ECONOGENE project ‘Sustainable Conservation of Animal Genetic Resources in Marginal Rural Areas: Integrating Molecular Genetics, Socio-economic and Geostatistical Approaches’ was funded by EU-FP5. This project was aiming at assistance of *in situ* conservation of sheep and goats and addressed relevant socio-economic factors and developed strategies for genetic management and rural development. EURECA will use (part of) the results and approach of the ECONOGENE project and apply the knowledge and methodology to another species.

- A Working Group of the European Regional Focal Point (ERFP) developed practical guidelines for the Constitution of National Cryopreservation Programmes in Europe (ERFP, 2003). The guidelines have been developed by a group of experts, based on existing knowledge, literature and a number of examples of gene banks in European countries. However, the Working Group did not assess cryopreservation activities in Europe in detail, but there is an increasing demand for exchange of organisational aspects, protocols, procedures, etc. to develop cryopreservation programmes. This new project will build on the ERFP Guidelines and to assess national cryopreservation programmes and to provide a method for future rationalization of cryopreservation programmes as a supportive tool for breed conservation.

- Oldenbroek et al. (1999) published a book, titled ‘Gene banks and the conservation of farm AnGR’, providing state of the art knowledge on conservation methods and strategies (also EU-funded). This book is extensively used in courses on AnGR management and conservation. EURECA will focus on the assessment of the value of practical tools, which are (partly) based on the general methodologies as described by Oldenbroek et al. (1999).
The objective of the EU-FP5 project EFABIS is to create an integrated infrastructure of databases to monitor farm animal biodiversity (FAB) in Europe. This new European database structure will help countries in collecting information about AnGR and will be integrated with the global database at FAO (DAD-IS). EURECA will collect additional, specific (breed) data which will be connected to the EFABIS database structure on national and European level.

Relevance to the objectives of the work programme

The EURECA proposal is a targeted action, which is relevant for all three main objectives of the Community programme established under Council Regulation No 870/2004:

- to help ensure and improve the conservation, characterisation, collection and utilisation of genetic resources in agriculture in the Community
- to complement and promote at Community level the work undertaken in the Member States for the conservation, characterisation, collection, and utilisation of genetic resources in agriculture
- to facilitate co-ordination in the field of international undertakings on genetic resources in agriculture.

This community programme calls for the development of strategies which support the enhancement of profitability of local breeds in order to develop links between local breeds and their typical products, to identify and to promote the value of local breeds for their environmental services (e.g. landscape conservation, agro-ecosystems management) and for their contribution to the multifunctional character of agriculture (e.g. maintenance of rural cultural diversity, rural development and tourism, etc.) EURECA is aimed at development of improved strategies for local/regional cattle breeds in order to make them more self-sustainable. The figure below shows the relationship between the project activities and the potential use of the outcomes.
EURECA is aimed at the improvement of *ex situ* and *in situ* conservation and breed development programmes for European, regional/local cattle breeds with the objective to achieve self-sustainability of the breeds. Status of current activities and programmes will be assessed largely in by case studies. Detailed breed case analysis will result in a better understanding of the factors affecting the rate of success of current activities and practices. After a detailed assessment of breed cases and cryopreservation programmes, the outcome will be used to assess a larger number of breed cases and *in situ* and *ex situ* programmes. A synthesis of the results of these assessments will result in guidelines and an expert system which will contribute to breed strategy development in Europe. In a number of breed demonstration cases, this project will already test the feasibility of the outcomes.

This targeted action will complement and promote the work undertaken in the Member States by exchange of knowledge, approaches and strategies between stakeholders in a diversity of European countries which is very important to be able to (further) improve or optimize conservation or breed development programmes on a national level. Many countries in Europe have a policy to conserve and sustainable use AnGR. Implementation of these policies on a national level will certainly benefit from a Europe wide assessment for local/regional cattle breeds and from assessment of the current conservation and breeding programmes. Furthermore, this project will result in enhanced cross-border collaboration.

EURECA will contribute to a better understanding of the trends in farm animal genetic diversity and the factors behind breed dynamics. The project will result in key indicators
to monitor trends in conservation and use of animal genetic resources. Furthermore, the project will discuss breed conservation and development across countries and will promote across country collaboration. Consequently, the project will support the international community in policy making for AnGR management in Europe and on a global level.

**DETAILED IMPLEMENTATION PLAN**

**Background and introduction**

During the last decades modern breeding techniques have greatly improved the production potential of most farm animal species. Local or regional cattle breeds have been replaced by specialized, modern dairy or beef breeds, called hereafter ‘main stream breeds’. A large group of local or regional European cattle breeds have been reduced to very low numbers already or still show a significant negative trend. Several reasons could contribute potentially to this fact:

- Farmers choose the breeds that appear to fit best in their production environment. This is not only a question of economic reality but also of social (fashion), political (recognition of a breed) or other driving forces that shape the perception of farmers.
- Today, the high level of technological and management tools allows at least certain farmers to adapt the production environment to the breed. The choice of an ‘adapted’ breed seems to be no longer an issue.

Despite this general trend, all European countries have regions, local situations or farming systems where alternative (local or regional) breeds suit at least as well as main-stream breeds, because of specific characteristics or the dual or multi purpose nature of these local or regional cattle breeds.

Status and trends of most of the European cattle breeds is available in the EAAP-AGDB database ([www.tiho-hannover.de/einricht/zucht/eaap](http://www.tiho-hannover.de/einricht/zucht/eaap)) and also in the global database of FAO (FAO-DAD-IS [http://www.fao.org/dad-is/index.htm](http://www.fao.org/dad-is/index.htm)). There are different systems in use to define the risk status of a breed (Gandini et al., 2005). EAAP-AGDB considers five categories of endangerment, based on expected cumulated inbreeding in 50 years. FAO (FAO-DAD-IS) uses breeding population size as the main criteria in the FAO warning system to assess degree of endangerment. The EU defined demographic risk status with the objective of assigning incentive payments to farmers that were keeping endangered breeds. This has been done for EU Council Regulation 1257/1999 and 445/2002 (Annex I). Rare Breeds International has proposed another system, based on annual registration of females. Although there are different approaches to estimate the risk status of breeds, one can conclude that a large number of cattle breeds in Europe is endangered or potentially endangered.

Within the group of endangered European local cattle breeds (i.e. based on EU criteria in 1257/99: less than 7000 females) there are two important categories of breeds, which will get attention in this study:

- Local breeds which are stable or growing in numbers. Some may be object of conservation action or may be self-sustaining.
- Local breeds declining in numbers. Some may be object of conservation actions, others may be not.
Despite the fact that local or regional breeds have great value for a variety of farming systems and for agri-environmental reasons, there is still a strong negative trend to replace local breeds by specialized breeds. In order to change or influence this trend—from a genetic resources or agri-ecosystem point of view—we need to understand the factors that influence farmers’ decisions and demographic and genetic developments in general. Often we face the problem of a vicious circle. If the number of animals of a breed declines fast or a breed has a rare status, it is not easy to achieve sufficient genetic progress on the desired traits and the breed tends to lose its competitiveness compared to more widely used breeds. On the other hand, there are specific opportunities for regional or local breeds to stay competitive.

Overall, the demography of livestock breeds is poorly understood, especially the factors affecting breed dynamics and the interactions between genetic, economic, social and political factors. Also, the impact of specific measures or conservation programmes is poorly understood. The question is: why is a (conservation) programme successful for one breed and less successful for another breed?

This project will be undertaken with the general objective to better understand the factors affecting demographic dynamics of local/regional cattle breeds and to assess the status and success of current breed development and conservation programmes. The better understanding of factors which contribute to the success of conservation and breeding programmes and best practises for in situ and ex situ conservation will be disseminated to interested stakeholders in different regions of Europe. Good practises, extracted from specific breed cases or from member states, will be disseminated to those stakeholders and the member states of an expanding European Community that want to strengthen or want to start the development of a breed for their local/regional cattle breeds.

**Approach and methodology**

The project takes a step-wise and qualitative/semi-quantitative approach. Detailed breed case studies (15 cases) and a detailed assessment of cryopreservation programmes (4 cases) will be followed by a European-wide survey. Parallel to this an assessment of available tools and methodologies will be carried out to support the genetic management in conservation and selection programmes of small populations. An ‘expert system’, best practises and guidelines will be drafted based on the outcome of the work packages 1-4. These guidelines will be tested in a limited number of breed demonstration cases (5 cases). Finally, overall results and the tested guidelines will be disseminated and communicated in different forms to a wide range of stakeholders, in order to support conservation and sustainable use of European, local/regional cattle breeds. The outcome of the project will also underpin EU policies with respect to conservation and sustainable use of AnGR and could lead to the identification of policy issues and bottlenecks.

Specific (technical) objectives of the project are:

1. To identify important factors that influence breed dynamics and the success or suboptimal success of 15 cattle breed cases.
2. Based on the results of 1. to determine a minimum set of parameters to analyse a larger number of breed cases (or for monitoring on a regular basis)
3. To collect data and experiences from 4 existing cryopreservation programmes and to identify criteria for (future) rationalization of cryopreservation programmes.
4. To test the results from item 1-3 in a Europe wide survey, using a restricted set of parameters
5. To assess existing tools and practises for their use in genetic management, conservation and sustainable use of small populations
6. To develop guidelines for successful programmes based on item 1-5
7. To carry out 5 breed strategy demonstration cases to test the guidelines (‘ex ante’)
8. To communicate and disseminate overall results of the project to potential users and stakeholders and to share knowledge and information with a diversity of stakeholders. This includes the identification of policy issues and bottlenecks to be communicated to the European Commission.

Expected results of the project are:

- A detailed evaluation of 15 cattle breed cases and identification of factors that influence breed dynamics and that determine success or suboptimal success.
- A minimum set of parameters for analysis of breed dynamics and analysis of (breeding or conservation) programmes
- A detailed evaluation of existing cattle cryopreservation programmes and gene bank collections
- A European wide survey of current ex situ and in situ conservation programmes for local/regional cattle breeds in Europe, based on a minimum set of parameters
- A survey of available methodologies and tools to assist the genetic management of cattle genetic resources
- Options or guidelines for better management and organization of breed conservation and development programmes (‘expert system’)
- Strategy documents from breed strategy development demonstration cases
- Advice how to modify existing AnGR databases to make them more useful for monitoring
- Publications of breed case analyses, survey results and proceedings of project meetings.

Work packages (WP)

The project activities are broken down into 7 technical work packages (WP1 – WP7), which run partly parallel and which are highly related:

1. Detailed assessment of cattle breed cases
2. Detailed analysis of cryopreservation programmes
3. European wide survey of national conservation and development programmes
4. Review of available supportive tools for genetic management in conservation and selection
5. Breed strategy demonstration cases
6. Development of guidelines for successful programmes (‘expert system’)
7. Dissemination and communication

Work package 8 is work package coordination and overall coordination

The figure B2.1.1 below shows the interdependency of the different work packages. Output of WP1 and WP2 will be input for WP3. Results of WP1, WP2 and WP4 will be used in WP5. Results of WP1-WP5 will be used to develop guidelines in WP6. Dissemination of results (WP7) will be done by all individual work packages.
In the following section, each work package and the coherence between the different work packages will be described. Figure B2.1.2 provides a schematic overview of data collection for each work package and the partners involved in data collection.

**WP 1: Detailed assessment of cattle breed cases**

WP1 will carry out a detailed assessment of 15 cattle breed cases in 9 countries in different sub regions of Europe. The evolution of the role of local cattle breeds in European agriculture during the last 2-3 decades will be analysed and critical factors that play a key role in determining presence of absence of breed self-sustainability will be identified. Possible elements, exploitable for achieving breed self-sustainability and a restricted set of parameters for surveying conditions for local breeds self-sustainability will be identified.

A methodology for assessment of these breed cases has been developed (as described in B2.3) and will be finalized in more detail at the start of the project. Genetic and socio-economic experts are jointly developing this methodology, taking an integrated approach for breed development and conservation.

Nine partners in the project identified 15 interesting breed cases in total, which are breeds with different characteristics, relevant in the context of this project and covering different regions of Europe. Annex A shows the list of 15 selected breeds. Although contacts have been made with breed representatives already, final decisions about selection of breeds will take place at the start of the project. The project partners are responsible for collection of data for
one or two breed cases, based on the agreed methodology, coordinated by WP1 leader. Project partners work closely together with all relevant stakeholders who play a role in breed development and conservation.

**WP2: Detailed analysis of cryopreservation programmes**

WP2 will evaluate 4 cryopreservation activities in 4 countries (or sub regions) in Europe, which are related to local/regional cattle breeds and will assess status and technical and organisational aspects of those programmes. It is known that cryopreservation programmes and cryopreservation activities are rather different between countries in Europe. However, there is very little known about the rationale behind the different approaches. The analysis of these programmes will result in recommendations for rationalization of cryopreservation programmes and a comprehensive set of parameters too be used for monitoring of cryopreservation programmes in a larger number of countries.

The methodology for assessment of the cryopreservation programmes has been developed (as described in B2.3) but will be finalized at the start of the project. The Netherlands, France, Italy and Finland (Nordic region) have been selected for this work package.

**WP3: European wide survey of national breed conservation and development programmes**

WP3 will use the outcome of WP1 and WP2 to carry out a European wide survey on cattle breed cases and cryopreservation activities related to these cattle breeds. A restricted set of parameters will be used in a questionnaire to approach all National Coordinators for AnGR (NCs), who are collaborating within the European Regional Focal Point for Animal Genetic Resources (ERFP). It is expected that NCs will either fill in the questionnaire themselves (if they have all relevant information) or the NC will contact relevant data providers in the country. All European countries (EU+), who are connected to the ERFP will be approached, in order to get a picture of the whole European region.

**WP4: Review of available supportive tools for genetic management and breeding**

WP4 will contribute to the technical management of conservation and breeding programmes of local cattle breeds. Existing tools and software and literature will be evaluated on their usefulness for genetic management. Outcome and conclusions from this work package will be disseminated to a wide range of (potential) users. Partner P3 is responsible for this work package and there will be a strong contribution from partner 9, who is a leading scientist in this field. Also other partners with practical or scientific experience on this topic will provide information to the lead partner(s) and contribute to the analysis and evaluation of the existing tools, software or methodologies. Dissemination of the results to a wide range of potential users (management of conservation programmes, breeders, herd books, National Co-ordinators, scientists) is a major objective of this work package.
<table>
<thead>
<tr>
<th>Breed (local name)</th>
<th>Breed (international name)</th>
<th>Country</th>
<th>Region</th>
<th>Status EAAP-database</th>
<th>Aspects of interest</th>
<th>Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reggiana</td>
<td>Italy</td>
<td>Valle Patina</td>
<td>endangered</td>
<td>strong negative trend 1940-1980, population decreasing start genetic improvement 1990, development cheese brand 1991</td>
<td>P2</td>
</tr>
<tr>
<td>2</td>
<td>Bianca Val Patina</td>
<td>Italy</td>
<td>Valle Patina</td>
<td>endangered</td>
<td>strong negative trend 1940-2003, population decreasing new herd book 1986</td>
<td>P2</td>
</tr>
<tr>
<td>3</td>
<td>Blanc Bleu Type Mixte</td>
<td>Belgium</td>
<td>Walloon + Flemish part</td>
<td>not endangered</td>
<td>strong decrease in numbers cross-border breed</td>
<td>P4</td>
</tr>
<tr>
<td>4</td>
<td>Villard de Lans</td>
<td>France</td>
<td>Rhône-Alpes</td>
<td>not endangered</td>
<td>almost extinct in 1977, 218 cows and stable now dual purpose breed, good genetic variability</td>
<td>P1</td>
</tr>
<tr>
<td>5</td>
<td>Ferrandaise</td>
<td>France</td>
<td>Auvergne</td>
<td>not endangered</td>
<td>almost extinct in 1978, 630 cows now, increasing dual purpose breed, good genetic variability</td>
<td>P1</td>
</tr>
<tr>
<td>6</td>
<td>Eesü maatõug</td>
<td>Estonia</td>
<td>Country-wide</td>
<td>endangered</td>
<td>coordinated by MTT, together with the breeding and AI organisation and conservation farms dairy production, 350 cows, stable</td>
<td>P5</td>
</tr>
<tr>
<td>7</td>
<td>Itäsuomenkarja</td>
<td>Finland</td>
<td>East part</td>
<td>potentially endangered</td>
<td>coordinated by the breeding and AI organisation dairy production, 4500 cows, stable</td>
<td>P3</td>
</tr>
<tr>
<td>8</td>
<td>Länsisuomenkarja</td>
<td>Finland</td>
<td>West part</td>
<td>potentially endangered</td>
<td>coordinated by the breeding and AI organisation dairy production, 4500 cows, stable</td>
<td>P3</td>
</tr>
<tr>
<td>9</td>
<td>Blaarkop rundvee</td>
<td>Netherlands</td>
<td>North-east+South-west</td>
<td>potentially endangered</td>
<td>strong negative trend 1950-1990, stable/growing at present dual purpose breed (low-input), several initiatives to promote the breed</td>
<td>P0</td>
</tr>
<tr>
<td>10</td>
<td>Roodbont MRY</td>
<td>Netherlands</td>
<td>South+East</td>
<td>not endangered</td>
<td>strong negative trend 1970 – now, crossbreeding dual purpose breed, high economic returns cross-border breed</td>
<td>P1</td>
</tr>
<tr>
<td>11</td>
<td>Pie Rouge (mixte)</td>
<td>Belgium/Luxembourg</td>
<td>Walloon + Flemish part</td>
<td>endangered</td>
<td>related to Roodbont MRY residual less HF crossed population, mostly in not-organized farms</td>
<td>P7</td>
</tr>
<tr>
<td>12</td>
<td>Kerry</td>
<td>Ireland</td>
<td>Country-wide</td>
<td>not endangered</td>
<td>most numerous of the three surviving indigenous breeds of cattle both in situ and ex situ conservation</td>
<td>P7</td>
</tr>
<tr>
<td>13</td>
<td>Polish Red Cattle</td>
<td>Poland</td>
<td>Country-wide</td>
<td>endangered</td>
<td>strong decrease in numbers after 1950 included in genetic resources conservation programme</td>
<td>P6</td>
</tr>
<tr>
<td>14</td>
<td>Avileña Negra-Ibérica</td>
<td>Spain</td>
<td>Six regions in Spain</td>
<td>not endangered</td>
<td>negative trend till middle 80’s integrative breeding programme (cow-calf, fattening, slaughter, quality label, AI) cross-breeding with Limousin and Charolais</td>
<td>P8</td>
</tr>
<tr>
<td>15</td>
<td>Blanca Cacereña</td>
<td>Spain</td>
<td>Extramadura</td>
<td>endangered</td>
<td>increasing numbers in situ and ex situ conservation and conservation farms social interest</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Guernsey</td>
<td>United Kingdom</td>
<td>Several small sub-populations</td>
<td>not endangered</td>
<td>small population of old type Guernsey cross-border breed</td>
<td>P7</td>
</tr>
</tbody>
</table>
WP5: Breed demonstration cases
WP5 will test the preliminary outcome of the analysis of WP1, WP2, WP3 and WP4 in a number breed demonstration cases. Breed strategies will be (re)developed in close collaboration with interested stakeholders of the breed. A multi-stakeholder approach will often be required to (re)develop strategies towards more self-sustainability of the breed. Four partners take responsibility to carry out a demonstration breed case. The partners have already chosen a breed for this purpose, but experiences from WP1 may result in minor changes. The breed demonstration cases will be evaluated afterwards and the outcome will also contribute to the development of guidelines or ‘expert system’ in WP6.

WP6: Development of guidelines for successful programmes (‘expert system’)
WP6 will finally carry out an integrated analysis and will summarize the outcome of the previous work packages WP1-WP5 in terms of guidelines. WP6 will result in a knowledge based decision support system for AnGR conservation and utilisation processes and strategies. Moreover, WP6 will develop a list of relevant indicators to monitor conservation and development of local/regional cattle breeds in Europe, which could be added as relevant data to the European (EFABIS) or global (FAO-DAD-IS) databases. Finally, WP6 will also identify policy issues and bottlenecks with respect to AnGR management and self-sustainability of local/regional cattle breeds, as support to EU future policies and regulations. The project coordinator and the work package leader will jointly work on WP6, coordinated by partner P2. The preliminary planning of WP6 is to produce the guidelines or the expert system in a one week meeting, after sufficient preparatory work.

WP7: Dissemination and communication
WP7 will focus only on the appropriate dissemination of results of all work packages. Results of WP1, WP2, WP3, WP4, WP5 will be disseminated by each work package through the project website, publications or contributions to workshops or conferences. The major output of this project however will be the results of WP6, which is a synthesis of results of previous work packages in a report or publication, which will be distributed in hard copies and electronically. The final outcome of the project will also be disseminated in a two-day project conference, with the objective to attract as many potential users as possible.

WP8: Coordination
The aim of WP8 is to coordinate activities of different work packages and to manage the project appropriately. Coordinator P0 has experience in leading similar projects and has formed a balanced team of work package leaders with different background and expertise. This will guarantee that the project will be successfully managed and will ensure that milestones and deliverables are achieved as defined in the project proposal.
Figure B2.1.2 Schematic overview of data collection

Existing tools, software and methodologies

WP1

WP2

WP3

WP4

WP5

WP6

Cryocase 1 P0

Cryocase 2 P1

Cryocase 3 P2

Cryocase 4 P3

Breedcase 1 P0

Breedcase 2 P0

Breedcase 3 P1

Breedcase 4 P1

Breedcase 5 P2

Breedcase 6 P2

Breedcase 7 P3

Breedcase 8 P3

Breedcase 9 P4

Breedcase 10 P5

Breedcase 11 P6

Breedcase 12 P7

Breedcase 13 P7

Breedcase 14 P8

Breedcase 15 P7

Breedcase 1 P0

Cryocase 1 P0

Cryocase 2 P1

Cryocase 3 P2

Cryocase 4 P3

NC1

NC2

NC3

NC4

NC5

NC6

NC7

NC8

NC9

NC10

NC11

NC12

NC13

NC14

NC15

NC16

NC17

NC18

NC19

NC20

NC21

NC22

NC23

NC24

NC25

NC’X’

Demo 1 P0

Demo 2 P1

Demo 3 P4

Demo 4 P7

Demo 1 P8

Demo 4 P7