Development of Policies and Strategies to Strengthen (Self) Sustainability of European Local Cattle Breeds

S.J. Hiemstra[*], C. Diaz[†], D. Duclos[‡], Y. de Haas[*], A. Mäki-Tanila[§], D. Martin[†], F. Pizzi[**], K. Soini[§], the EURECA Consortium[††] and G. Gandini[‡‡]

Introduction

About 20% of the breeds of the world are considered to be "at risk" (FAO, (2007a)). In Europe, about 45% of local cattle breeds are categorized "at risk" (EFABIS, (2010)). European countries have developed strategies for conservation and sustainable use of AnGR, including for local cattle breeds, in line with international obligations (e.g. FAO 2007b). Local cattle breeds often have important cultural, historical, socio-economic, and environmental values, in addition to be important sources of genetic variation. Many different factors have impact on the state and future of local cattle breeds. One important question in a dynamic and complex world is how through new policies and strategies we can positively influence the success of local breeds and their "(self) sustainability"? In Europe, member states may provide incentive payments to support 'local breeds in danger of being lost to farming' (EC, (2005 and 2006)). However, there is a general aim that incentive payments should not be permanent and making local breeds (self) sustainable should be promoted. The aim of the EC co-funded project EURECA (www.regionalcattlebreeds.eu) was to get a better understanding of the breed (self) sustainability and the factors affecting it in Europe, which may help in defining policies and strategies.

Material and methods

Information on local cattle breeds is available in the European database (http://efabis.tzv.fal.de/). In addition to this data, we interviewed farmers and a wide range of stakeholders and experts in order to get a better understanding of factors affecting (self) sustainability of the breeds.

Farmer interviews. We surveyed the factors affecting the state of 15 cattle breeds by interviewing their keepers, altogether 371 farmers, in eight European countries (Gandini *et al*, *submitted*). In an attempt to capture a good amount of cattle diversity in Europe, we selected beef, milk and dual purpose breeds and breeds with different demographic trends (increasing, decreasing, stable) and size. Farmers were asked how the size of their local cattle herd was expected to change in the next five years: increase, no change, decrease or stopping farming. We used the farmer's willingness to change herd size in the near future as

[*] Centre for Genetic Resources, the Netherlands, Wageningen UR, P.O. Box 65, 8200 AB Lelystad, the Netherlands
[†] INIA, Dpto. Mejora Genética Animal Ctra de la Coruña km 7,5, Madrid, Spain
[‡] Institut de l'Elevage, 149 rue de Bercy, 75595 Paris Cedex 12, France
[§] MTT Agrifood Research Finland
[**] IBBA CNR, via Bassini 15, 20133 Milan, Italy
[††] www.regionalcattlebreeds.eu
[‡‡] Department VSA, University of Milan, Via Celoria 10, Milan, Italy

an indicator of breed (self) sustainability. Farmers were also asked information on a total of 44 aspects, including the farmer and its farm, land use, herd composition, economic role of the cattle on farm, and motives and values in keeping local cattle breeds.

Role of cryopreservation. Cryopreservation of germplasm of cattle is a useful tool to conserve genetic diversity, as a back up in case problems will occur, and to support breeding and genetic management programs. Detailed Guidelines have been developed for cryopreservation programs (Hiemstra, (2003)). In addition to comparisons made earlier (e.g. Danchin-Burge and Hiemstra, (2003))) a detailed survey was carried out in France, the Netherlands, Italy and Finland, in order to detect similarities and differences and to formulate recommendations for development of cryopreservation programs for local cattle breeds.

National Coordinator's views on status of local cattle breeds. In a Europe wide survey, National Coordinators (NC) for Animal Genetic Resources were asked to fill in a questionnaire to get a better understanding on the state of local cattle breeds using a limited number of parameters, in addition to the data available in the EFABIS and DAD-IS databases. In total, 32 NC's were asked to fill in the questionnaires for 173 breeds, and 108 breed questionnaires from 24 countries were returned.

Use of SWOT analysis for decision making. One of the most widely used tools in strategic planning is the SWOT (e.g. Hill and Westbrook, (1997)). In the EURECA project we used SWOT analysis adapting it to the case of European local cattle breeds, to identify strategies, which could support breed (self) sustainability. A SWOT analysis compiles internal (Strengths (S) and Weaknesses (W)) and external factors (Opportunities (O) and Threats (T)). Applied to local cattle breeds, S and W refer to breed and farmers' characteristics that help or hamper (self) sustainability (Martin *et al., in preparation*). O and T are the external conditions that could favour or compromise this objective. Strategic decisions can be made based on the use of the SWOT matrix (Weihrich, (1982)) that helps to identify the interactions between the internal and external factors. In the EURECA project weighting of factors have been used to prioritize strategies. Internal and external factors were identified by farmers and a variety of stakeholders and the SWOT analysis was used to identify strategic opportunities at breed level. Moreover, across country/across breed SWOT analysis was used to identify common factors for policy development.

Results and discussion

Farmer characteristics. Results of the farmer survey showed that most of the studied aspects differed among countries and breeds. In particular three important aspects were found to affect the trend of herd size (Gandini *et al., in preparation*). These aspects were: 1) age of the farmer, 2) level of cooperation with other farmers of the local breed, and 3) farmer's opinion on the appreciation of the local breed by the society. "Age of farmers" was negatively correlated with future herd size (our indicator of breed sustainability). Both "farmers opinion on the appreciation of stakeholders on the local breed" and "the capacity for collaboration with other farmers" were positively correlated with the trend of herd size. The European wide survey (108 breeds) showed that 75% of the local breed population was kept on farms smaller than average size farms in the country, which may be a threat. On

average, local breeds contributed less than 25% to the family income, which could be explained by the fact that many breeders were hobby or part-time farmers. For 25% of the breeds a specific breed-associated product or "niche market" was reported. Regarding incentive payments by governments, the survey showed that for 26% of the breeds no specific subsidies were given to farmers.

Breed organization. The European wide survey also showed that for 75% of the breeds, at least 60% of cows were registered in an official herd-book. Across countries, the main stakeholders involved in conservation of local cattle breeds were individual breed societies, national government and research institutes. Only 14 breeds (out of 108) did not have a breed society or breed interest group. Few farmers/animals of local breeds belonged to regular milk or beef recording. More than half of the breeds in the survey lacked any kind of performance recording. Further promotion of the specific aptitudes of local breeds, in particular in harsh environments, was considered as one of the major opportunities. Moreover, technical assistance and herd book keeping were indicated to be of key importance for the maintenance of local breeds. Some breeds seemed to be clearly supported by specific product development, financial aid, promotion and good collaboration between farmers in breed societies.

Cryoconservation. Detailed analysis of the four case study countries showed many similarities and differences. Above all, it showed the value of conserving multiple generations of genetic variation in gene banks in addition to proper management of genetic variation in breeding programs. The European wide survey showed that for 93 out of 108 local breeds, there was cryopreserved stock of semen available. But the total amount of existing semen (in genetic reserve or for routine purpose) was very different among the breeds. On the contrary, cryopreservation of embryos was quite rare. Artificial insemination was used much less by the farmers of local breeds compared to mainstream breeds. It was estimated that for almost 50% of the breeds, less than 20% of cows were artificially inseminated.

Management of genetic variation. Proper management of genetic variation within breeds is crucial for breed sustainability. Results of the surveys showed that within breed genetic variation might be maintained due to the limited use of AI and/or by nationally coordinated cryopreservation programs. Moreover, it appeared to be even more important to promote collaboration between farmers and to develop breed specific and sustainable breeding programs.

Use of SWOT analysis in policy and breed strategy development. Based on the 15 breed case studies we identified several categories of strengths, weaknesses, opportunities and threats. Internal factors (strengths and weaknesses) were related to the animal, the breed, products, production systems, farmers and their organisations or marketing. We identified categories that were considered as strengths but not weaknesses, for example factors related to local breed products. To the opposite the factors related with the marketing of products were always considered weaknesses. External factors (opportunities and threats) included, among others, policies and legislation, market, infrastructure, local trends and macro trends aspects. New functions of cattle and the marketing of new products were viewed as

opportunities for the development of local cattle breeds in Europe. We concluded that a SWOT analysis approach involving a variety of stakeholders was a very useful approach to define strategic priorities. Different breeds may follow rather different strategies to enhance breed (self) sustainability. The latter also implies that common policies may not always be beneficial to all breeds. We suggest that a variety of incentives or support measures may be needed to serve the variety of local cattle breeds across Europe.

Conclusions

The EURECA project showed substantial diversity in the state of local cattle breeds and the factors affecting breed (self) sustainability. Given the number of local cattle breeds "at risk" in Europe, the different values associated to local breeds, and the obligation of countries to conserve livestock biodiversity, there is a need to develop policies and strategies strengthening the position of local cattle breeds. Both common policies and tailor-made breed specific strategies are needed. Common policies could address the transfer of farms to next generations. In addition policies could also positively influence the connection between farmers, breeds and society. Beside general policies, a variety of specific measures or projects are suggested to promote collaboration between farmers and to promote and technically support *in situ* or *ex situ* conservation activities.

Acknowledgements

References

Danchin-Burge and Hiemstra (2003). *In*: *Workshop on Cryopreservation of Animal Genetic Resources in Europe*, editor: D. Planchenault, Paris 2003.

EC (2005). *Council Regulation* (EC) No 1698/2005.

EC (2006). *Commission Regulation* (EC) No 1974/2006.

EFABIS (2010). *http://efabis.tzv.fal.de/*, last visited 20 February 2010.

FAO (2003). *In*: *Proceedings of the workshop held in Swaziland*, 7-11.5.2001.

FAO (2007a). *State of the World's Animal Genetic Resources*.

FAO (2007b). *FAO Global Plan of Action for Animal Genetic Resources*.

Gandini *et al*. (2010). *AGRI* submitted.

Hiemstra (2003). *ERFP publication*. S.J. Hiemstra (*editor*).

Hill and Westbrook (1997). *Long Range Planning*, 30(1) (1997) 46-52.

Martin et al. (2010). In preparation.

Weihrich (1982). *Long Range Planning*, 15(2) (1982) 54-66.