



REPORT ON THE WORK OF THE NATIONAL STANDING COMMITTEE ON FARM ANIMAL GENETIC RESOURCES 2008-2011

Introduction

This report provides an overview of the work of the National Standing Committee (NSC) on Farm Animal Genetic Resources from its inception in 2008 until March 2011. Following the UK Government's 2010 review of 'arms length bodies' the NSC was reclassified as a Departmental Expert Committee (rather than a Non-Departmental Public Body) with effect from April 2011. The new committee will continue to provide advice on Farm Animal Genetic Resources (FAnGR) issues to Government and other stakeholders.

With over 208 native breeds, the UK has one of the richest FAnGR in the western world. These breeds and strains, and the variability within them, are of great economic, social and cultural importance. For these reasons alone, it is important that we care for them. Additionally, we have national and international obligations to do so. Also, there are non-native breeds of major economic significance in the UK, and we need to ensure their future 'genetic health'.

We already have a strong tradition of caring for our FAnGR in the UK – thanks largely to the activities of individual breeders, breed societies, charities and non-governmental organisations. However, the threat to our FAnGR is growing, for a variety of reasons, including the spread of relatively few, specialised breeds, economic pressures on primary producers, the appearance of a number of exotic diseases and the spread of some endemic diseases.

For these reasons, there has been increasing activity in recent years in relevant UK Government and Devolved Administration departments, working with the industry, to help co-ordinate efforts to manage our FAnGR. These have included:

- Publication of the **UK Country Report on Farm Animal Genetic Resources** <http://www.defra.gov.uk/fangr/documents/ukcountry-rpt2002.pdf> in 2002 by the Department for Environment, Food and Rural Affairs (Defra), with contributions from the relevant devolved administration departments in Scotland, Wales and Northern Ireland. This was the United Kingdom's official contribution to the FAO's **First Report on the State of the World's Animal Genetic Resources** published in 2007 as part of FAO's Global Strategy. <http://www.fao.org/docrep/010/a1250e/a1250e00.htm>
- Formation of a **UK National Steering Committee on Farm Animal Genetic Resources** in 2003, which oversaw:
- Publication of the **UK National Action Plan on Farm Animal Genetic Resources** (in November 2006).

<http://www.defra.gov.uk/environment/biodiversity/geneticresources/documents/fangr-actionplan.pdf>

- Formation of the **UK National Standing Committee on Farm Animal Genetic Resources** in 2008 (fulfilling **Recommended Action 1** of the National Action Plan).

The National Standing Committee's principal role was to provide advice to Government and interested parties on issues relating to farm animal genetic resources (FAnGR) and to oversee implementation of the UK National Action Plan on Farm Animal Genetic Resources.

The NSC met quarterly from its inception. Additionally four sub-groups of the committee were formed to work on Identification and Monitoring (I&M); Conservation and Sustainable Use (C&SU); Research and Development (R&D) and Education and Communication (E&C). These sub-groups have interacted more frequently and the sections below identify the highlights of their work.

We launched a website in May 2009 and have published biannual newsletters since 2009 - these are archived on our website

<http://webarchive.nationalarchives.gov.uk/20110126095423/http://www.defra.gov.uk/fangr/newsarchive.htm>. We have also provided advice to government and other stakeholders on a wide range of issues connected to FAnGR, including definitions of breeds, breeds at risk, animal health legislation and control measures, animal genetics and disease, animal genetics and welfare, labelling of foodstuffs and cloning.

We have made progress on most of the 38 Recommended Actions in the National Action Plan (see **Appendix A** for a more detailed account). However, there remains an urgent need to improve the harmonisation, collection and use of electronic data on livestock breeds to enable important national obligations on monitoring to be fulfilled. (This is relevant to **Recommended Actions 2, 4, 7 to 9, 11, 13 to 16** of the National Action Plan and to subsequent work on Biodiversity Indicators for farmed livestock species). Some of the research recommended in the National Action Plan is still to be commissioned (especially in relation to **Recommended Actions 13, 16 and 19**). While progress has been made on 'mainstreaming' FAnGR policy in the UK (**Recommended Action 27**), more remains to be done. This is especially relevant to Target 13 of the Convention on Biological Diversity (CBD) Strategic Plan for 2011 – 2020, recently agreed in Nagoya. The target is that 'by 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity'.

Identification and Monitoring

The task of the Identification and Monitoring sub-group, shaped by the Recommended Action of the National Action Plan (NAP), was to provide an infrastructure for answering the questions '*What is a breed?*' and '*When is a breed native?*', and '*Is the breed at risk?*' The first two questions are concerned primarily with identification of genetic resources whilst the last one is concerned with monitoring. The questions were not completely devoid of answers from the outset: for example the UK Country Report on Farm Animal Genetic Resources to FAO in 2002 contained a list of breeds, a classification of whether these were considered native or not and whether they were considered to be at risk. However, within this groundbreaking report, the exclusion and inclusion of resources were not always consistent and origins of numbers for classifying risk were not transparent. Therefore the sub-committee was required to bring consistency and transparency to these issues.

Not all of our vital farm animal genetic resources are 'breeds' - a large part of the pig, beef, sheep and poultry sectors rely on producing commercial products from crossbred animals, which are more productive, with pure breeds maintained to produce these crossbred animals. **Recommended Action 2** of the NAP was to establish and then monitor the structure of the livestock sectors identifying the relative importance of the crossbreds and pure bred resources and their genetic make up. A sheep structure report had been obtained prior to the formation of the NSC which was used as a template for the other sectors. With the constraints on funding, I&M recommended obtaining structure reports for poultry and beef sectors since both were poorly documented. Both reports were completed during the period, the former through a commission, and the other through serendipitous synergy with other research and development.

Turning to the pure breeds, **Recommended Actions 3 and 4** required the NSC to establish the UK National Breed Inventory and provide guidelines for inclusion in this inventory. The inventory was established at <http://grfa.org.uk/> with data as included in the 2002 UK Country Report. However whilst the NSC supported the updating of European Farm Animal Biodiversity Information System (EFABIS) from that database, the NSC wished to maintain a separate inventory that was explicitly concerned with UK resources.

Work on updating the list of breeds and population data is underway. A key task of I&M was to provide a set of guidelines to govern the inclusion in, and exclusion from, the inventory. Given the complex structure of our farm animal populations and the dynamic nature of the gene pools forming them, the construction of robust guidelines was challenging, but was completed to the satisfaction of the NSC. These guidelines consider what qualifies as a breed, what is considered native and what is meant by feral, *in the context of Defra's role in the conservation of farm animal genetic resources.* The NSC considered how the historical status of Ireland affected the definition of native breed in the UK: given the definition of native developed by I&M and accepted by NSC, a small subset of breeds that are considered native to the Republic of Ireland were also considered to be native in the UK. This action was taken with the agreement of the government FAnGR representative in the Republic of Ireland.

Recommended Actions 5 and 6 are concerned with the characterisation of the resources. **Recommended Action 5** could never be comprehensively completed without further strides in biological understanding and was not advanced due to a lack of funding. **Recommended Action 6** was completed with the aid of a research commission. While this was valuable, the work should be expanded to include equidae.

The I&M, supported by the NSC, viewed **Recommended Actions 7, 8, 9 and 10**, which are all concerned with monitoring, as being intimately related to each other. Consequently the I&M developed a proposal for a UK monitoring system that would (i) improve the quality of the data used to assess risk that is obtained and stored by Defra, (ii) share burdens for achieving this with industry, and (iii) be highly cost-effective. Unfortunately, this required a small start-up cost for implementation which was not made available, despite sustained arguments for its desirability. These actions and the implementation of a cost-effective system for updating population data remains an outstanding and urgent issue for the NSC, its successor and its sponsors.

Recommended Action 11 was acknowledged to be an important step, but this could not be progressed due to lack of funds, although NGO's active in the field are promoting electronic herd and flock books wherever and whenever possible. The incorporation of animals outside herd and flock books, **Recommended Action 12**, was not aggressively pursued as it was considered a subsidiary issue to the monitoring of the herd and flock books. However the possibility of using British Cattle Movement Service (BCMS) data for cattle was explored in the beef structure report and this approach was found to be wanting. It was concluded that the breed information contained within BCMS was primarily an indicator of sire breed and did not give accurate breed information.

Recommended Actions 13, 15 and 17 are concerned with prioritisation of resources and aspects fall within I&M as well as C&SU remits, and as a result many joint meetings were held to address these actions. A workable answer was obtained on how geographical endemism should be treated as an indicator of risk - and which breeds then fall into the category of being at risk as a result. This was obtained using outcomes from other R&D although the NSC failed to obtain a commission to address this, and there are still issues to be resolved. This was integrated into 'at risk' categories as part of **Recommended Action 15** and **17**. In relation to **Recommended Action 17**, the NSC approved the recognition of three levels of numerical risk leading to conservation activities: the first pertaining to eligibility for agri-environment funding since such schemes were viewed as providing an initial safety net and a chance for re-assessment of a declining breed; secondly, a lower threshold which would qualify the breed for being considered at risk in the event of an epidemic of, for example, Foot and Mouth Disease, where breed numbers can change rapidly; and thirdly, a threshold where the breed is sufficiently rare to require close and active monitoring. Ascertaining the 'at risk' status of all breeds for these criteria based upon existing information fulfilled **Recommended Action 15**.

In developing the thresholds for **Recommended Action 17**, I&M pursued the widening of arrangements pertaining to slaughter of rare breeds in the event of an epidemic. The Committee recommended widening the class of diseases and species covered by the arrangements from solely Foot and Mouth Disease and Foot and Mouth Disease-susceptible species, and removing numerical thresholds on herd/flock size for qualification. In this respect the NSC was extremely pleased to see the development of policy by Defra and the DAs that met these criteria. However, the NSC remain concerned over the procedures proposed for implementing the policy and want to be convinced that they are workable in a number of aspects. An existing system (Breeds at Risk Register) which is considered by the NSC to be more likely to be effective is due to be cut by Defra. The NSC recognise that this is a difficult area, but has recommended that: (i) the cost and sourcing of the services for the existing procedures are reviewed urgently; (ii) current practices for epidemic emergencies make better use of the existing system, so that its value can be better assessed before any action is taken to cut it. The NSC would like to see further 'mainstreaming' of FAnGR issues in animal health policy formulation.

Conservation and Sustainable Use

The Conservation & Sustainable Use (C&SU) sub-group worked on National Action Plan Recommended Actions concerned with practical management of FAnGR (**Recommended Actions 29, 30, 33 to 36, 38**). Of particular importance have been the changes agreed with Animal Health in respect of notifiable disease measures. As above, the system established for the protection of FAnGR resources in an outbreak of Foot & Mouth Disease has now been extended to cover all notifiable diseases in all farm species. It has also been agreed that these arrangements would be applied to any animal or group which qualifies and no longer be subject to a minimum number.

Liaison has been established with breed societies and an initiative developed to encourage better recording of their animals, greater participation in genetic resource management and address a number of breed-specific issues. However, we recognise that even greater dialogue with breed societies will be needed in future to achieve National Action Plan aims. The group considered developments on the island of Jersey where the historically pure-breeding population is now open to introgression from Jersey cattle bred elsewhere. Assurances have been received that registration procedures will enable the original population to continue to be identified in the herdbook.

The C&SU group has undertaken a comprehensive review of the breeds present in the UK and determined which can qualify as a native genetic resource and be eligible for the various rural support measures, as mentioned above. The group has worked closely with colleagues on the I&M group to develop robust procedures for establishing the native and at-risk status of breeds. (**Recommended Actions 13, 15 and 17.**)

A full structure report on the poultry kept in the UK has been published and has identified the areas where poultry data and structures are less well developed than in the ungulate species (**Recommended Action 2**).

There has been regular dialogue and interaction with many other bodies, such as FAWC, on relevant issues to ensure a joined up approach (**Recommended Action 35**). The preparation of Approved Breeding Programmes has been initiated with other interested bodies and input has been made to the CAP reform process to raise the profile of FAnGR considerations.

Members of the C&SU Group have supported the production of publications in the scientific and technical literature relevant to farm animal genetic resources.

Research and Development

The Research and Development sub-group helped to develop more detailed specifications for research projects recommended in the National Action Plan, provided technical reviews for sponsors on reports from these projects, and others relevant to the work of the committee, and produced recommendations on, and priorities of, further research needed (Recommended Actions 25, 31).

The projects commissioned by Defra to meet recommended actions of the National Action Plan have been completed now. Final reports are available as indicated below:

- IF0180 – Review of molecular characterisation studies relating to UK Farm Animal Genetic Resources.
http://randd.defra.gov.uk/Document.aspx?Document=IF0180_8608_FRP.doc
- IF0182 – Would livestock breeding goals change if carbon and nitrogen efficiency, rather than economic efficiency, were the priority objectives?
<http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=16594&FromSearch=Y&Publisher=1&SearchText=IF0182&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>
- IF0183 – Review of nutrient efficiency in different breeds of a farm livestock.
<http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=16595&FromSearch=Y&Publisher=1&SearchText=IF0183&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>
- IF0149 – Determining strategies for delivering environmentally sustainable production in the UK ruminant industry through genetic improvement.
<http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=15846&FromSearch=Y&Publisher=1&SearchText=IF0149&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>
- WC0717 – Developing and indicator of Genetic Diversity in Selected Farm Breeds.
<http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=16062&FromSearch=Y&Publisher=1&SearchText=WC0717&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

- AC 0204: A study of the scope for application of research in animal genomics and breeding to reduce nitrogen and methane emissions from livestock and food chains.
<http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=14662&FromSearch=Y&Publisher=1&SearchText=AC0204&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

Prior to the NSC being created, a project was commissioned by Defra on geographical concentration. The resulting report by The Sheep Trust and partners highlights the geographical concentration of some sheep breeds: www.defra.gov.uk/fangr/documents/sheeptrustrpt-090205.pdf and <http://www.york.ac.uk/org/cnap/tst/endemism/PublishedArticle.pdf>

Other projects that we are aware of, which are relevant to the aims of the NSC, include:

- RIDGENE – an Industry demand led project on inherited diseases in livestock. <https://ktn.innovateuk.org/web/ridgene-industry-club>
- Quantomics – EU framework 7 project, aspects of which examine the use of dense DNA marker information in the management of diversity in mainstream populations <http://www.quantomics.eu/>
- Development of a National Genotyping Service to deliver key benefits for the Scottish Sheep Sector <http://www.sac.ac.uk/news/newsarchives/08n71genetic>
- Results from a completed study on Biodiversity indicators have been included in the 'Biodiversity indicators in your pocket' publication for 2010 <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=16062&FromSearch=Y&Publisher=1&SearchText=genetic&GridPage=27&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

The Committee had some reservations about the commissioning of research and would welcome greater dialogue with research sponsors on specifications of research tenders relevant to FAnGR, evaluation of bids and monitoring of projects, to ensure maximum benefit is derived from the research spend.

Education and Communication

Education and communication activities were integral to the work of the NSC as it sought to advise and engage with Government, Industry and Advisory bodies.

Initial activity of this sub-group was to develop a communication plan (**Recommended Action 21**). Tools used to disseminate messages included the website, the progress log, newsletter, a new FAnGR leaflet and breed structure reports (**Recommended Action 26**).

An important element of the communication activity has been the meetings between NSC FAnGR representatives and key policy staff from Defra, the Devolved Administrations and industry stakeholders. The NSC also provided advice to Ministers, including a statement on cloning published in September 2010.

The NSC responded to a range of consultations including a FAWC consultation on disease and farm animals, TB consultations in England and Wales, and the Food Standards Agency consultation regarding cloned animals.

The E&C group have identified 'success stories' of native breeds relating to food marketing and environmental management (**Recommended Action 22**), which have been linked to the FAnGR website. The group also reviewed and produced discussion papers on education resources and training in relation to FAnGR (**Actions 23 and 24**).

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