Consultation on TSE Breeding Programme for Rare Breeds of Sheep

We are writing to you in response to the above consultation paper issued by Defra. As you know, The Sheep Trust is a national charity founded from Heritage GeneBank, an academic organisation established during the Foot & Mouth Disease (FMD) epidemic of 2001 to help protect the farm animal genetic resources (FAnGR) of the UK’s national flock. The Sheep Trust, a national charity, has identified a priority list of geographically concentrated sheep breeds, traditionally farmed and genetically distinct, in need of continuing protection. These Heritage Breeds are the focus of The Sheep Trust’s activity and the Trust responds to relevant consultation documents on behalf of these breeds and their breeders.

Heritage Sheep Breeds and native rare breeds are a part of the UK’s FAnGR and as such should be afforded protection from possible endangerment. The derogations from the National Scrapie Plan as provided for by Commission Decision 2003/100/EC should be utilised, as the compulsory measures being introduced in 2006 are likely to have negative effects upon both rare and other breeds that do not have a suitable genotype profile to sustain compulsory measures.

Although table 2.1 shows some interesting genotype variations between the rare breeds the table does nothing to illustrate how the compulsory measures will affect a breed. When breeding within a small population it is important to look at all aspects of the breed in order to make a breeding decision. Selection based upon one criteria like genotype is considered potentially damaging. Levels of ARR alone cannot be used as VRQ levels are also important as is the breed demographics and overall breeding strategy for the genetic development of the breed. We would agree with the statement in the consultation document that a derogation based on the level of ARR is not the preferred criteria and that selection upon levels of VRQ would be more favourable, however it would be more effective to take into account the effective population size and combine this with levels of VRQ and ARR.

The use by Roden and Townsend of effective population size instead of total population size is a preferred method of estimating effects on a breed. It is never the total population that contribute to the next generation of offspring. However, in population genetics it cannot be assumed that mating is essentially random. Animals are kept across many different farms leading to a highly selective breeding environment, within which, enforcement of the compulsory system would only serve to exacerbate this
selectiveness. Breeding advice provided does not necessarily indicate a level of compliance with the advice as individual breeding goals may take precedence. Therefore extending the time frame for some breeds by four years may still lead to damage of the breed genetics. It is likely that many breeds will have developed in number since the study and therefore current breed numbers and effective population sizes should be gained. The Wiltshire Horn and Kerry Hill are no longer on the RBST lists and therefore no longer come under the derogation.

The Roden and Townsend study has provided a good background and starting point for a discussion upon this issue, however, there are some items within the study that should be investigated further.

- The Soay has a population of 1120 ewes and 150 rams; the Oxford Down has a population of 1159 ewes and 180 rams, however, the stated effective population size of the Soay is 97 compared to the Oxford Down with 37. This would appear at first glance not possible, however due to the fact that the effective population size has been calculated to take into account the loss of heterozygosity through inbreeding the figures are likely to be correct for the breeds at the time of the study. However we would recommend caution; figures for the levels of in-breeding can go up and down over relatively short timescales as they are greatly affected by active management or by chance from using an unrelated ram in one generation. This pattern could also be true for other breeds in the study.

- The figures should be checked and re-calculated using current population numbers as the breeds will have developed in the 4 years since the study. As stated above breeding within these breeds will be highly selective and therefore the actual effective population size will be lower than that calculated when using a formula for random breeding effects. When adding to this the effect of selection for scrapie genotype the effective population will be further reduced and this should be noted when looking at where breeds fall within the proposed groups. Within some more numerate Heritage Sheep Breeds the effect of selection for scrapie genotype as well as breed characteristics can place the breed at risk due to there being an inadequate genotype profile.

- Placing the Greyface Dartmoor in group D with an extended removal of VRQ over four years is clearly not recognising the fact that the study states the breed has an effective population size 67 and also highlights that ‘other population factors may be having an adverse effect on genetic diversity’. Because of these factors the breed should be granted full derogation and this illustrates a problem with the use of the study data within the consultation.

Regulation (EC) No 445/2002 uses the figure of 10,000 breeding ewes and below as the criteria for a breed ‘being lost to farming’. In this respect we agree to using the Rare Breeds Survival Trust (RBST) watch list, however, we would strongly recommend that Defra be aware of those breeds that are geographically concentrated and have a genotype profile that is not favourable for breeding for scrapie resistance in combination with a low effective population size. In these cases it would be advisable to provide advice and an extended time frame before compulsory measures are implemented.
We would raise concerns of the validity of the data contained in the Pollott survey of 2002/3 with respect to this particular issue. The issues with this survey arise from the concerns over the accuracy of the survey data, given that the survey did not reach 100% of farmers. The survey was also reliant upon a farmer knowing the exact breed and numbers that were being kept. This will have led to unsubstantiated numbers for breeds as they would include unregistered animals and those whose breeding might not be totally discernable due to cross breeding or a mistake by the farmer.

Issues for Comment:

1. Commission Decision 2003/100/EC where animals in danger of being lost to farming would be exempt from the requirement to slaughter or castrate VRQ animals does appear to be the most appropriate way forward for native rare breeds, however it is important not to lose sight of the problems and concerns for genetic diversity faced by geographically concentrated breeds with a small population; for example those represented by The Sheep Trust – Herdwick, Rough Fell, Lonk, Derbyshire Gritstone, amongst others. Some of the Trust’s breeds have low levels of the ARR allele and care does need to be taken with respect to monitoring the progress of these breeds and any loss of genetic diversity.

2. In the UK RBST is recognised as the authority on rare breeds and it therefore follows that their lists should be used when selecting rare breeds for inclusion into the scheme.

3. The other derogations do not reflect the varying requirements of different breeds and therefore we feel that they should not be used.

4. As the EC regulations are applicable to all of the EU we feel that where a breed is represented in another country it should be preserved in that country. For guidance it would be worth consulting the NSP Semen Archive Management Board (SAMB) or the National Steering Committee (NSC) on Farm Animal Genetic Resources, as SAMB recognises only native breeds for inclusion into the archive and the NSC is a good source of information for breed numbers in other member states as well as related actions being taken in those countries.

Response to the Options:

Option 1 This option is not acceptable with respect to rare breeds.

Option 2 Given that questions have been raised concerning the data contained in the impact assessment with respect which breeds should be included and the general complexity surrounding decisions of which breeds are to be included it is not felt that this option should be implemented.

Option 3 This option appears to be the most appropriate way forward in order to achieve the goals of the regulation and to ensure that there are no detrimental effects to the genetic resources of rare breeds. By utilising the advice given by both the RBST and NSPAC those breeders that keep rare
breeds can make the decisions that work best for their flock and for the breed rather than being forced down a route that could be detrimental. The management issues surrounding this option are also more conducive to success as there will not be some breeds on one system and others on a different system.

Option 4  Genotyping of animals is only to be of real use and progress can only be made if advice is afforded to those that need it. With this in mind this option cannot be utilised as the benefits are negligible.

We are concerned that whatever approach is decided upon for the rare breeds, that it takes account of their particular situation. We further recommend that a separate consultation is issued to address the problems faced by Heritage Sheep Breeds – those that are geographically concentrated and can have unfavourable genotype profiles placing them at risk from the compulsory scrapie genotyping programme. Although moving towards a scrapie resistant sheep flock will be beneficial for animal health and public perception, this progress cannot be at the expense of the genetic resources of the sheep industry. In this respect more breeders should be encouraged to come forward with rams for the NSP semen archive and rare breeds archive, so that important genetics can be preserved until such a time that we may need to use them.

Yours sincerely

Sam Jones
National Coordinator
On behalf of the Trustees of The Sheep Trust.
conservation and sustainability

www.thesheeptrust.org

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