



Emily Gascoigne
MA VetMB MRCVS
Emily qualified from the Cambridge veterinary school and is currently a farm animal vet with Synergy Farm Health in Dorset. She is also a small ruminant alternative resident with the Royal Veterinary College, London, and a member of the Rare Breeds Survival Trust and the Hebridean Sheep Society, and has her own flock of Hebrideans.



Peter Siviter
BVetMed MRCVS
Pete qualified from the London veterinary school and is a production animal vet at Synergy Farm Health, spending much of his time with rare breeds, especially pigs.



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RARE BREEDS

On being a vet for rare breeds

Veterinary surgeons in mixed and farm animal practice come into contact with rare breed varieties of farm animal species. The Rare Breeds Survival Trust (RBST) was founded in 1973 and since its inception has seen the resurgence of many native British breeds.

As a veterinary surgeon, having an understanding of the genetic and phenotypic value of these breeds will lead to greater appreciation and understanding of the production goals for many flocks and herds and can lead to positive working relationships and opportunities for progressive flock/herd planning.

The RBST and the Rare Breeds Movement

The Rare Breeds Survival Trust is a charity founded in 1973 with the ambition of conserving British native breeds of livestock species. Intensification of the global farming industry and modern farming methods following World War II accelerated the extinction of many British breeds, with heavy horses outcompeted by automation.

Relative inability to compete on a commercial scale and to meet commercial targets had led to this reduction, but the rare breeds movement recognises the alternative importance of retaining national breed diversity. It acknowledges the social importance of these diverse and historic breeds as part of the British farming legacy, their ability to utilise and perform in non-favourable conditions – North Ronaldsay sheep on their native island, for example – and their importance for preventing genetic constriction of their species.

Maintaining this bank of non-improved animals, where little selection pressure has been applied, protects the genetic library available to the commercial sector in the

future with potential global significance. For example, there is evidence that some of the primitive rare breeds of sheep have increased endoparasite tolerance, so maintaining the gene frequency may be crucial in the future as genomics is explored and the sector looks for animals with these genes (Golding and Small, 2009).

The RBST monitors the number of breeding animals of each species and breed on its register and additional threats to the long-term survival of each population. Whilst breeds may be added to the register based on breeding females, geographical vulnerability is also identified, together with relative risk analyses for each breed – as was the case with the Herdwick in the 2001 foot-and-mouth outbreak with the majority of the breeding flock within the Cumbrian National Parks heavily affected.

In addition, the Trust manages the ‘Gene Bank’ – a frozen semen bank of embryos and semen straws of critically

endangered bloodlines of cattle, sheep, goats, pigs and horses.

Crucially, the movement aims to optimise the health and diversity within the recognised breed catalogues, limiting inbreeding and loss of diversity and managing these small populations. The Trust also provides marketing advice and a selling forum for rare breed owners with national shows and sales, where buyers can source pedigree animals on the register. In addition, it also co-ordinate national shows for rare breed animals.

Why do people keep rare breeds and what do they do with them?

Rare and native breeds are found on smallholdings, in commercial herds and flocks, in registered premises – herds/flocks under the management of the RBST, for instance – in open farms and in conservation grazing schemes (Figure 1).

Some stewardship schemes encourage the usage of native British breeds in grazing management schemes, so

Figure 1. Many of the rare breeds are used in conservation grazing systems often requiring low input but high health strategies.



vets should expect to see these breeds outside of the smallholding. This is typically a consequence of their different grazing behaviours (Newborn et al, 2000) and often as a public attraction. Furthermore, the traditional characteristics of their carcasses make them popular with premium meat outlets – even some UK supermarkets are marketing meat from rare breeds, including Gloucestershire Old Spot pork and Dorset lamb.

Studies have looked at the comparative production of rare breeds with no conclusive disadvantage emerging with regards to meat sales in terms of yield and retail value in comparison with other breeds (Hall and Henderson, 2000).

The variety of breeds within the rare breed catalogue is appealing to smaller flocks, as is the perceived importance of conservation whilst breeding animals. There is also a large showing movement, with classes across the UK for rare breed animals.

What is a rare breed?

Having an understanding of the definition of a rare breed is helpful in appreciating the relative importance of each individual animal. The RBST defines threshold targets as part of its conservation policy and aims to identify those breeds at most risk to enable targeting of resources. The RBST maintains the registrations for the majority of breeds on the Watchlist through the Combined Flock Book (their annual registration).

Breeds are defined in risk categories on a progressive scale:

- Critical (e.g. the Suffolk horse)
- Endangered (e.g. the original population of Aberdeen Angus cattle, prior to Canadian/USA genetic introduction)



Figure 2. A Red Poll calf in Canterbury, New Zealand. The rare breeds community is large with global resource pooling and knowledge transfer for vets and farmers.



Figure 3. Working with rare breeds can facilitate the development of novel services.

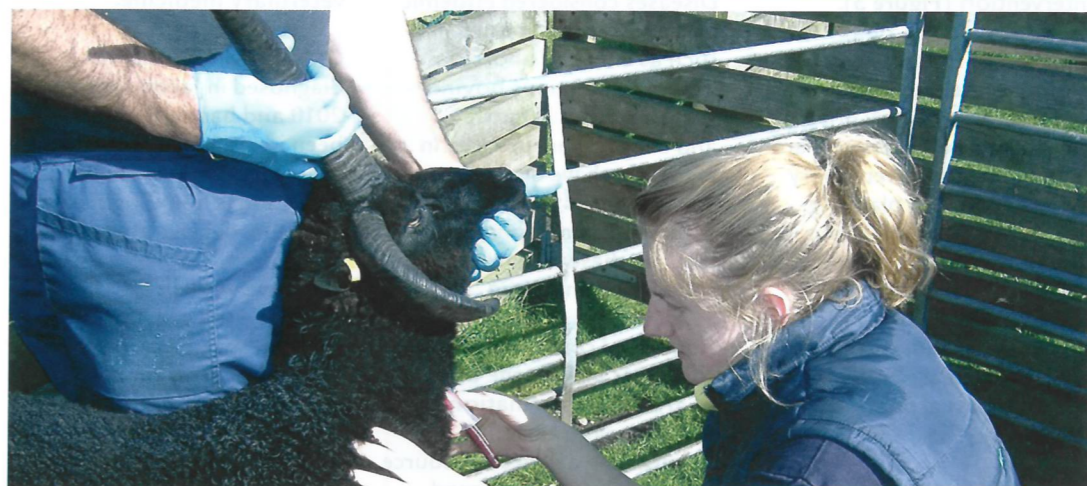


Figure 4. Establishing high health strategies can be crucial for flocks. Here is a four-horned Hebridean ram being bled as part of an infectious disease screen.

- Vulnerable (e.g. the Middle White pig)
- At risk (e.g. Irish Moiled cattle)
- Minority (e.g. Dorset Horn sheep)
- 'Native', no longer on the register (e.g. Red Poll cattle) (Figure 2)

The relative number of breeding females necessary per category varies between species – 3,000 breeding ewes are necessary for a breed to move to category 6, but just 1,000 breeding sows are necessary for a pig breed to move to 'native' recognition. A critically endangered breed of cattle – such as the Northern Dairy Shorthorn, a former commercial cow capable of yielding >6,000 litres per lactation – has fewer than 150 breeding females left on the register.

Although the 'native' breeds list is extensive and they are popular animals, commonly seen on farms – Shetland sheep, Belted Galloway cattle and the Jacob sheep, for instance – they are not considered at significant threat.

Key opportunities for veterinary intervention

Because of the relative importance of individuals within a flock or herd of rare breed animals, there is increased opportunity for progressive veterinary intervention (Figure 3).

Optimising reproductive performance and youngstock survival rates are key drivers of conservation success and are opportunities for veterinary input and health planning. Management of infectious diseases affecting these two key sectors are critical for the success of a rare breeds programme and, where possible, disease eradication should be an aspiration (Figure 4).

Given the high level of movements to shows and sales within this sector, and the movement of breeding



Figure 5. Working with rare breeds can be very rewarding for both vet and keeper.

animals across the county to maintain genetic diversity and limit inbreeding, biosecurity strategies are essential. With evidence of increasing key production-limiting diseases in sheep – Maedi visna (Ritchie and Hosie, 2014) and contagious ovine digital dermatitis (CODD) (Duncan et al, 2014), the emergence of new diseases such as porcine endemic diarrhoea virus in pigs, and the perpetual challenge of bovine tuberculosis – a robust prevention strategy is essential.

Diseases considered endemic in the respective species – such as enzootic abortion in sheep, infectious bovine rhinotracheitis in cattle and enzootic pneumonia in pigs – may have disastrous consequences at both a commercial and conservation level for these businesses. This should be considered.

Additional conservation strategies include the use of artificial insemination and embryo transfer in maintaining a genetic resource and maximising its spread nationally – both of which necessitate veterinary input. Complementary strategies

have included the export of breeding males away from the highest densities of stock to reduce the risk from epidemic diseases in a geographically dense population and to maintain diversity outside the main epicentre of the breed. The North Ronaldsay Sheep Fellowship has piloted a project removing rams from the island for this purpose.

Alternative applications

There are key examples of application of rare breeds in advancing human and veterinary medicine.

GM2 gangliosidosis was diagnosed in Jacob sheep in 2010 and has subsequently been identified in the UK sheep population. This condition is homologous with the neurodegenerative disease of children, Tay-Sachs disease. Genomic work in the USA has identified the genetic mutation in Jacob sheep associated with the expression of the condition (G444R mutation).

Work on the American genetic pool suggests that the genetic bottleneck created from a high co-efficient of inbreeding has led to a high frequency of

the gene and presentation of the disease. The Jacob sheep is now used as an animal model for human disease.

The RBST regularly analyses inbreeding coefficients with their 'Geneped' analysis, based on relatedness of individuals within the population; but clinicians should be aware of the risks associated with small populations and aware of novel presentations of diseases.

Common pitfalls involving legislation

Whilst most pedigree breeds are interested chiefly in selling replacement livestock, the main objective for many is to target the food chain directly with a niche product that commands a premium. Many of these breeders are not commercial farmers, so it is important that their veterinary surgeon understands the legislation surrounding such an enterprise.

Using an approved slaughterhouse

Remember that a 'home kill' – an animal not slaughtered at an approved abattoir by

trained slaughtermen – can only be used for private consumption and may not be sold to the general public. If pigs or ruminant species are intended for sale, then the approved slaughterhouse route must be used.

The producer should contact the Food Standards Agency (FSA) for advice and further certification if they wish to perform any meat processing at home or on the farm.

Choosing places to sell

Many smallholders feel that the best way to gain a premium for their product is to sell through farmers markets, local butchers or farm shops. In order to do this, the animals must be slaughtered as described above, and the place of sale must be known to the local council and comply with guidelines set down by the Food Standards Agency and Trading Standards Institute.

Product labelling

Product labels must not only be accurate, but also conform with the requirements dictated by the Trading Standards Institute (details on its website), which prevents the misuse of specific product descriptions such as 'pedigree' or 'free range.'

Producers should also be aware that certain foodstuffs, such as Parma ham and Wensleydale cheese, have an EU-recognised 'protected designation of origin' (PDO) and as such can only be sold by those names if produced within a specific geographical area. A list of the product names included in these schemes can be found on the Database of Origin and Registration (DOOR) online.

Conclusion

Rare breed flocks and herds often have different targets to typical commercial herds and engagement with these clients can mean there are

opportunities for progressive health management. Health and welfare strategies are essential for optimising both production of replacements and production of premium meat products, often with an emphasis on sustainability.

Whilst individual animals often have a high value for a population – and although their economic value may not apparently reflect this – owners frequently engage with veterinary practitioners. These premises provide a unique opportunity for veterinary surgeons to engage in individual, flock and national health and breeding strategies and can be highly rewarding (Figure 5). ■

References

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Torres PA et al (2010). Tay-Sachs disease in Jacob sheep. *Molecular genetics and metabolism*, 101(4), pp.357-363.

Useful links

Rare Breeds Survival Trust, www.rbst.org.uk

Food Standards Agency, www.food.gov.uk