

The Need to Conserve Different Types of Shetland Sheep

Dr. D. Phillip Sponenberg is a professor at the Department of Pathobiology, Virginia-Maryland Regional College of Veterinary Medicine. He is also the Technical Director of the American Livestock Breeds Conservancy. He is especially interested in animal pigmentation, animal genetics, and reproductive pathology. We are delighted that he is interested in the Shetland sheep and has graciously taken time and effort to share some of his views and insights with us.

Shetland sheep are a very interesting example of the phases of development through which a group of domesticated animals can go. It is important for breeders to reflect on the general process, and then also reflect on exactly where in that process the sheep currently fit.

Groups of domesticated animals vary from one another by several mechanisms. One of these is the founder effect, which is simply a reflection that the chance inclusion of certain founder animals will largely determine the type of animal contained in a population. Shetland sheep fit squarely into the Northern Short-tailed group of sheep breeds. This is no accident, and is a reflection of geography and history. It would have been truly surprising if they were not of this group. The overall variation in Shetland sheep, therefore, is somewhat circumscribed by the fact that they are of this breed group and not some other.

Another source of breed or population distinctiveness is isolation. Isolation allows chance variations to become established in a population. Certainly no one can argue that the Shetland Islands are isolated! This isolation has led to the development of a unique sheep breed which could not otherwise have developed. Certainly sheep similar to the founding Shetland sheep were introduced to other parts of the British Isles during the Viking incursion, there, but only on the Islands, with their isolation, was it possible to prevent the uniqueness of these founders from being overwhelmed by succeeding waves of other newly introduced types and breeds.

Selection can also foster uniqueness. This is usually secondary to founder effect and isolation as a means of developing uniqueness, but it certainly has a role. Selection implies some very specific goals and aims of breeders. Good examples would be specific sizes, fleece types, horn character, and colors. Usually in a poorly defined breeding environments the different flocks will all have slightly different goals and while each flock may be different in some detail or another the overall variation is still present.

The stages of breed development are a reflection of the sources of variation. The least defined stage is that of a landrace. Landraces are somewhat genetically consistent, usually due to the founder effect and isolation. Usually there is a minimal selection in landrace populations, which are owned and managed by people outside of the agricultural mainstream. This allows landraces to maintain more variability than the next stage of breed development, which is the standardized breed.

Standardized breeds were historically developed from landraces. At some point in landrace development breeders banded together, and decided to put limits on the variations allowed. They also set up some descriptive goals to aim for in breeding programs. Standardized breeds are bred to conform to a standard, imposed on them by the breeders. Standardized breeds have less variability than do the landraces.

The final stage in breed development is the industrial stock. Industrial stocks are highly and scientifically selected for very narrow environments, very specific inputs, and very carefully defined selection goals. They vary even less than standardized breeds. Modern examples include poultry, swine, and even dairy cows.

At each stage of this development something is lost and something is gained. Genetic variability is specifically lost at each stage of development. This genetic variability can be important if selection goals are redefined. For example, it would be easier to modify a landrace from within than it would be to modify a standardized breed, which in turn would be much easier than modifying an existing industrial stock. The other side of the coin, though is predictability. Each stage of the evolution of a stock is successively more predictable, simply because it is less variable. This is advantageous in an industrial setting, and is really a requirement as well for those breeds used in crossbreeding systems. The predictability of a standardized breed or an industrial stock is exactly what is needed in a crossbreeding scheme.

The question for Shetland Sheep breeders to reflect upon concerns the location of the Shetland sheep breed along the continuum of landrace-standardized breed-industrial stock. Each stage has its advantages for breeders. My opinion is that Shetland sheep are still in the landrace stage, or at least on the Islands they still are. They are moving into the standardized breed category on the British mainland as well as in the United States. Breeders need to decide in which category this group of animals belongs, because that will help to determine the philosophy of selection imposed upon these sheep.

A landrace needs to have variability. Obviously the Shetlands do vary for color. Fleece character is also no doubt variable, and even more so in the Shetland Isles. It is very typical for northern short tailed breeds to vary for fleece type. The fine end of the Shetland spectrum is the end that always gets rave reviews, though. The fine end of the Shetland spectrum is unique among British breeds, and therefore caught the eye of every agricultural writer since it is an extreme. There were and are other Shetland fleeces that are truly Shetland, but less extreme and therefore less unique. Some hairy fleeces, for example are not non-Shetland, but merely a variation of fleece types present within the group. This is the sort of variability that is likely to be lost if breeders forget this is a landrace, and begin to force it into a standardized breed.

Horn character and number is also a good example of variation. I know of no recent occurrence of multiple horns in Shetland sheep, but it is entirely expected of this group of sheep to produce multiple horns in at least some sheep. The account of Thomas Jefferson of his multi-horned Shetland is no doubt accurate, but this may be a variant that is already lost. Other variants that should be expected to be in the Shetland sheep include increased fecundity and maybe even leader sheep such as occurs in Icelandic sheep. Too much standardization will inadvertently lose some of these variants which might be useful to some breeders under certain circumstances.

One way to approach the issue of variability and of landrace versus standardized breed is to consider that it is best to describe landraces, and let them simply be what they are. Standardized breeds, in contrast, should be defined and this should be closely monitored, as that is the goal of breeding. Description versus definition is an important difference in breeding philosophy, and this difference needs to be pondered by all breeders.

Maintaining variability is difficult in a breed. As soon as a breed becomes registered there are forces which decrease variability. This is not all bad, since predictability increases. It is still important, though, for this loss of variability to occur as a matter of design and not by default. It is an issue for breeders to ponder before the variability is gone.

One good mechanism for maintaining variability is for breeds to undergo card grading rather than the traditional showing. Traditional showing places individuals in rank order of (perceived) merit. Card grading simply places all animals into larger groups: excellent breeding animal, superior breeding animal, good breeding animal and one class unfit for purebred breeding. Each animal is evaluated by a team of three inspectors, who base the evaluation on the breed standard. The sheep should be evaluated in pens, and there should be no indication of ownership or breeding. This system produces a group of "firsts", which is much more close to the truth than the traditional system which produces one "first" animal. The strength of card grading is that it acknowledges that there is no best animal for all situations, and the evaluation reflects that fact.

It is important for Shetland sheep breeders to ponder the issues around the character of their breed, and how much variation is good. It is also important to ponder the mechanisms by which the variability can be maintained and not be lost to show ring fashions or fads. All of these issues need to be pondered well before any threat occurs to the breed. So much has been lost from so many breeds that it would be a shame for the Shetland breeders to not learn from the mistakes of others.