

## A Breeding policy for Minority Breeds

by G. L. H. Alderson

*This article was first presented as a paper at the Annual General Meeting of the British Caspian Society, in November 1979. The examples quoted in the paper relate to Caspian Horses, but the principles of animal breeding which they illustrate apply with equal relevance to any minority breed.*

One of the most contentious subjects in animal breeding is that of inbreeding. Some regard it as a dangerous practice to be avoided at all costs, while others employ a type of inbreeding (line-breeding) as a valuable aid in their breeding programmes. Line-breeding can concentrate the qualities of an outstanding animal in its progeny, but unplanned line-breeding can reduce standards of performance and fertility and in some cases will expose genetic defects. Whatever its role as a factor for 'improvement', one thing is certain, namely that inbreeding will lead to a narrowing of the genetic base of a breed, and will reduce its flexibility and ability to adapt to changing circumstances in the future. These dangers have been recognized even by those who control the fortunes of the most popular breeds and they pose an appreciably greater threat to minority and rare breeds.

In every breed there are fashionable sires and unfashionable sires. The former are over-subscribed and the latter are neglected and this concentration of attention on a relatively small proportion of elite animals can lead to a loss of bloodlines and associated genetic material. This in turn can result in a rapidly escalating problem, when breeders search desperately for unrelated stallions to mate to their mares. Thus in a numerically small breed there is a need for breeders to sacrifice some of the independence of action and participate in a broader breeding policy designed to safeguard the future interests of the breed as a whole. Although it is not easy to persuade pedigree breeders to accept the disciplines inherent in such a policy, from past experience it seems it can be launched initially on a voluntary basis and it is usually accepted without the necessity for any imposition, provided the objectives and reasons are explained sensibly.

**Two Basic Principles** The two basic principles of a group breeding policy are the maintenance of distinct bloodlines and the use of cyclic crossing between these bloodlines to minimise the increased level of inbreeding. If those remnants of the Caspian breed which may or may not remain in Iran are ignored, there are six extant sire lines in the breed on which to base a breeding programme. All the stallions and mares are allocated to one of these lines, according to their type and the main influence in their pedigree. The best mares in each line are mated to stallions in the same line (line-breeding) in order to maintain each line as a distinct entity. The other mares are mated to stallions in the next line in the cycle. Figure 1 (not reproduced) shows a typical pedigree of an animal bred in this way, and its coefficient of inbreeding is less than 1% in the first four generations.

**Compensatory Mating** The sequence of lines within the breed must be planned so that the weaknesses of a particular line are corrected by the strengths of the next line. This is known as compensatory mating and should be an integral part of any breeding programme. Thus, among Caspians the line based on Daria Nour is noted for jumping ability, small size, good head and forequarters, but is suspect on hocks and feet. In contrast the Palang line is very good for confirmation, especially the hocks, but he has a less refined head and is taller than average. The Ruba line is of good type, with a quality head. Thus in a system of cyclic crossing the best sequence for these three lines is Daria Nour, Palang, Ruba.

**Sire Lines and Female Families** The stallions in each line are detailed in Table 1. The Ruba line is very dominant within the breed, while both the Ostad and Zeeland lines are very vulnerable. With a group breeding programme these latter lines must be encouraged and expanded. Strictly the Ostad

line does not exist in Great Britain in direct tail male line and must be reconstructed from animals with a high concentration of Ostad in their pedigree. The future of the Zeeland line depends on a single stallion. In discussions on breeding programmes, undue emphasis tends to be placed on the males, but in practice, especially in numerically small breeds, some females emerge as powerful influences. Among Caspian mares, Taliyeh consistently breeds good foals and is the dam of five stallions. Thus she is contributing significantly to the danger of inbreeding. The limited number of female families in the breed accentuates this danger and should be counteracted by the deliberate use of as many foundation mares as possible to breed stallions.

**Incrossing** One of the problems of inbreeding is that it may lead to decreased vigour, reduced performance and the emergence of hidden defects. Conversely, the mating of distantly related animals may produce foals of increased vigour, while the mating of two inbred animals from different lines can lead to a high degree of hybrid vigour. This latter technique, known as in-crossing, is used widely in plant breeding and was applied either by accident or design in the breeding of the great Thoroughbreds of the post-war period. Sea Bird II, who won both the Derby and the Prix de l'Arc de Triumphe, was produced by mating an inbred mare from a French staying line to an inbred stallion from an American sprinting line. The combination of line-breeding and cyclic crossing which is recommended here produces in-crossing. Animals which are the product of in-crossing are likely to be above average performers, but their reputation as stallions is unlikely to match their success on the race track. Thus there is a continuing need to use line-bred animals in the breeding programme, although their own performance may not be so outstanding.

**Selection and Culling** Traditional breeding programmes have been built around outstanding animals such as Taliyeh. In some cases these animals are identified by the 'eye' and skill of a breeder. In some cases the art of breeding has been complemented by the science of genetics and the progeny test is used more widely as a measure of excellence. But in both cases the result is the same, namely the concentration of the breed on fewer and fewer bloodlines. The most severe reduction in genetic material in a breed occurs when there is extreme selection for the production of outstanding individuals, such as Derby winners, rather than for the average quality of the breed. However, it is interesting to note that the current record for the Derby has stood since 1935 and that for the Oaks since 1927. Despite the better tracks, improved riding and training techniques and better nutrition, the speed of the Thoroughbred is not increasing. It may be that a performance peak has been reached or it may be that inbreeding is cancelling out the effects of selection for improvement. Examples can be drawn from the inbreeding of other species, especially pigs, to show how intensive selection has led into a genetic cul-de-sac. The lesson for rare breeds such as the Caspian is that attention must not be focused on a few fashionable animals. Rather a broadly based breeding programme must be followed, with the emphasis placed on the culling of below standard animals to raise the average quality of the breed. The severity of the culling must be governed by population size, when a breed is low in numbers only defective or markedly untypical females should be culled, and relatively high proportion of stallions should be retained. It must be a basic rule that no sire line or female family should be allowed to die out.

**Function Efficiency** As a minority breed increases in numbers the severity of culling may be intensified to a limited degree, but still with the proviso that each line and family is maintained. Furthermore the culling and selection should not be unduly influenced by the vagaries of show-ring fashion, but rather by the characteristics of functional efficiency. These characteristics include not only tooth and jaw structure, action, tail setting, etc., but also the ability in jumping, eventing and driving competitions, for it is the success and publicity achieved by the Caspian in these activities that will serve to recommend it to the wider public. The process of establishing a breed follows four phases. First its distinctive qualities must be identified (e.g. jumping ability, speed, temperament). Second a function must be identified (e.g. riding pony, racing pony, eventing). Third its qualities and performance must be documented. Fourth its value must be publicised.

**Special Characteristics** The success of the whole breeding programme rests on the initial assumption that the improvement of the distinctive characteristics is the common aim of all the breeders. In the absence of this objective the justification to conserve the breed is invalid. It is pointless to use the breeding techniques described here to turn the Caspian into yet another pony of the native British type. It is a miniature, and during its evolution in the stony mountainous area of northern Iran, it has developed those special qualities which are now of great value and by which it is identified. The Caspian stands 10-12 hands high but with the graceful conformation of a Thoroughbred or an Arab, which makes it so suitable as a riding pony. This use and its performance in driving trials, is further enhanced by its kind and tractable temperament. Its hooves are tough and hard, with a small frog and never need shoeing. Its hind quarters on occasion attract criticism from the show-ring devotees, but it may be that the remarkable jumping ability of the Caspian and its powers of acceleration stem from this aspect of its confirmation and emphasise the need to evaluate each animal more in the rigours of strenuous competition than the show-ring. In this way the Caspian can hope to retain its true and distinctive identity.

Copyright Lawrence Alderson, 1979

**Lawrence Alderson was involved with Caspians at the beginning of their history in the UK. At the time of writing this, he was a trustee of Rare Breeds International, a registered charity with the aim of preventing the loss of diversity in global farm animals. To find out more about RBI visit their website. This article is reproduced with Lawrence's permission.**

*Editors' note; This paper was first presented in 1979 and yet line-breeding is as relevant now as it was then. With each successive generation the genes of Foundation stock become more dilute. The late Brian Wood, the society's Blood lines Advisor, reported that an analysis of bloodlines carried by Caspians registered in 1999 and 2000 showed that there were 11 bloodlines of 4% or less inbreeding. Brian Wood wrote in 'The Caspian' magazine on Caspian bloodlines and advised CHS Council on this subject.*