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COLOR INHERITANCE IN SHELTIES

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Though the color of a Sheltie is one of the least important points as regards showing, it looms large in the eyes of the novice buyer, and at times, the breeder. The wide choice of colors and the admixture of many of them make it necessary to know how they behave in breeding so as not to lose the clear, bright colors specified by the Standard.

The three basic colors, sable, tricolor and blue merle, are easy to define and follow according to the laws of their inheritance; what is less easy to predict is the shading and patterns associated with the fundamental colors.

Sables are possibly the most numerous and desirable of the three basic pigments. This varies very much from the clear, golden color minus any but a trace of black shading to the rich, red mahogany sable with a large amount of the dark pigment. White markings in many amounts complicate this picture.

The tricolor is a combination of black with a sable pattern factor showing up on the ears, sides of face, spots over the eyes on the legs and under the tail, with the white pattern factor superimposed on it.

The blue merle combines all three colors: black, white and sable, with a merle pattern factor, making areas of the black become a shade of blue-gray -- either light silver or darker, pigeon blue, depending on the presence or absence of an additional factor for dilution. In both tricolors and blue merles the pattern factor for sable may be missing so that the tricolor becomes a bicolor black and white, and the blue merle a blue and white minus the sable or tan. Both tricolor

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and sable may be missing the white factor to become black-and-tan or self-sable without any white at all, though this is rare now-a-days. In the other extreme, the color areas may be much reduced or missing to produce varying amounts of white-bodied Shelties, some with color head markings and body spots in all the basic colors.

To simplify the inheritance of the three major colors: we find sable in any of its shades is dominant over tricolor, which leaves tricolor recessive. In the few cases where sable puppies appeared from tricolor parents, they were due either to a rare recessive sable from some remote ancestor or the tricolors were not true tricolors, but would be found to have some sable shading in the undercoat which did not show -- or even to an unknown mis-mating.

This means that sables bred to tricolors will produce all sable puppies unless there are tricolors back of the sables. Then one or more tricolors could appear. The tricolo factor can be eliminated by breeding sable t itself for several generations, when it is said to be pure for sable and cannot produce tricolor again without introducing one. Two true tricolors, bred together, can never produce sables except in the rare instances noted above.

Merling is a pattern factor and is dominant over both tricolors and sables and can produce merles with either one: sable merles with sables and blue merles with tricolors. The merle factor is also a dilution factor and sable merles will be a paler sable where the merle factor is present. The merle factor is also dominant over white and may produce this color or absence of it with merle markings, if factors for white are present.

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When a sable with little black is bred to a tricolor, the resulting puppies may be a mahogany or very dark sable, the result of imperfect dominance of the sable over tricolor or of a pattern factor for shading. This is the way to obtain the dark mahogany color once it is lost: breed a golden sable to a tricolor. There are varying amounts of black shading in most of our sables, hence the sable name for the color, and those that have it could carry a tricolor factor, although I am not certain about this. If two dark sables bred together do not produce tricolor puppies, then they do not carry the factor for it. If a sable of any shade is bred to a tricolor, those pups will be bound to carry a tricolor factor since they get one color gene from each parent. However, these puppies will not have tricolor offspring unless and until they are crossed with a sable also carrying the tricolor factor or are bred to tricolors. Since it carries one color factor from each parent and a tricolor has only tricolor factors (one from each parent), puppies from a tricolor-factor-carrying sable bred to a tricolor are bound to be (on the average of many litters) 2 tricolors to 2 sables, each carrying the tricolor factor.

Two golden sables, neither carrying a tricolor factor from any ancestor, should have all golden sable puppies. A slightly black shaded sable is probably more apt to have sable offspring with this black than a darker dog. These golden sables also appear from dark sable parents -- often only one per litter, due to the recessiveness of the color to shaded sable -- but somewhere back in the ancestry of each dog will be found to be a dog of this color. It is necessary to know

the colors of all the ancestors to determine this, but wherever this color appears it has traced to ancestry of this color, possibly to Collie crosses.

There is another color in Shelties that is puzzling because it starts with a golden and then becomes a brownish shade later on, losing the yellow. I have seen it in crosses of lightly shaded goldens to dark sables. The coat often becomes progressively darker as the dog ages, more black hairs seeming to appear.

Tricolors are the simplest color to breed true, provided they are not crossed with sables to get rust in their black. One must also notice their tan. If it has come from blue merle breeding, it may show the effects of the dilution factor and be a pale tan. The rich red tan trimmings are more desirable and may result in a better shade of blue by removing the dilution factor which produces the pale or silver blue.

Markings of white are more complicated because they are another pattern factor of many parts. White marks on the face vary from a pencil thin stripe to a broad white blaze, and on the neck from a white patch to half or full white collar, narrow or wide as the factors may be. White on the chest may be narrow or wide, and on the legs vary from white paws to half white or full white forelegs, and the same for the hind legs except that white extends only part way up the leg in its maximum amount. The white tail tip varies from a few white hairs to a sizable tuft, but is almost always present.

Once it has been brought in, some white is bound to appear since the presence of it dominates its absence. The early Shelties had little of it until the Collie crosses splashed it all over the place. While it is nice to

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see even, so-called "perfect" white markings, breeders seldom pay much attention to them. Champions are made with practically no white on them because of quality that cannot be turned down. On the other hand, it is possible to breed for full, white collars to the exclusion of much else -- as one breeder has done by discarding all dogs that did not have a full white collar, no matter how good in other respects.

Two Shelties with maximum white markings might produce puppies with additional white, possibly because they did carry a factor for white from some remote ancestor. This would result in a splash-marked dog with white where it was not wanted. White bodies are undoubtedly due to the infusion of foreign blood -- which is what is behind the barring of white by the Standard.

The practical application of these color theories is to reproduce the colors you want when you want them. A shaded sable, i.e., one with black hairs mixed in the red or gold color, crossed with a non-shaded sable, does produce a majority of shaded puppies. If each parent carries the factor for pure gold minus the shading, you can get up to one-half the litter clear or unshaded. Two very dark dogs are apt to produce all dark progeny, except where the gold factors are carried recessively. Two blue merles may also throw a preponderance of merle puppies, though tricolors are possible

It is fascinating to follow the color theory in breeding. One seldom sees the dark mahogany or shaded sables in Collies any more, giving credence to the theory that the clear red or gold color breeds true. It should be possible to bring back the mahogany Collie by breeding one of the golds to a tricolor as it

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is done in Shelties.

One more point is that it is also possible to breed a Sheltie pure for any color by breeding only to that color for several generations, thus eliminating the other factors from the germ plasm, leaving it homozygous (which is the technical genetic term for purifying the germ plasm and making it produce only one color or other factor: always breeding true).