

We, in no way, claim to be geneticists. This chart and these explanations are derived from study, observations and our own experiences. Our purpose in compiling this chart is to present the necessary information in as simple a method as possible. We would like to separate the myths from the facts and perhaps clarify some questions.

The first important thing to understand is that in the Sheltie there are ONLY two color genes—sable and black. All other colors that we experience are caused by different influences acting on the base coat color of either the sable or the black dog.

MERLING GENE

The merling gene is a dilution pattern gene, not a color gene. It works at random on the base coat color causing the Blacks to be Blue Merles and the Sables to be Sable Merles. There is no predicting what the merling pattern will be in any given individual. There are, however, certain Shelties who tend to produce a specific type of a merled pattern, such as large black spots on a light silver coat, usually accompanied by a large face blaze and blue eyes.

The merling gene is a dominant gene. One of the parents must be a Merle in order to produce Merled puppies. This gene does not carry on for generations unseen and suddenly appear causing a Merled individual or one with blue eyes. It has absolutely no influence on a Non-Merle, regardless of how many Merles are in the pedigree or in its litter. There is another gene that has nothing to do with the merling gene, that causes blue eyes in Sables and Tris.

MALTESE DILUTION GENE

The maltese dilution gene is another gene that dilutes the coat color but is not a merling gene. This gene dilutes the black pigmentation evenly on all parts of the body. The Blacks are grey and the Sables are a champagne color with no merling. The eyes are light, the nose and eye rims are grey; all areas that would normally be black are washed out. This is probably a recessive. These individuals should not be used for breeding. This dilution gene is acceptable in breeds such as Weimaraners, Great Danes, Doberman Pinschers and others; but not in the Shetland Sheepdog. This kind of dilution gene should not be confused with the dilution merling gene.

DOUBLE MERLES

Double Merles are the result of mating two Merled dogs, each parent giving its merling gene. The double merle causes the coat to be diluted twice; the result appearing to be white with grey to black spots on the black coats and brown spots on the sable coats. Keep in mind that Double Merles are not genetically white dogs, but black or sable dogs merled (diluted) twice; merled once to blue in the black coats or to champagne in the sable coats and merled again, to white. A large number of these individuals are defective in sight and/or hearing because of the double dose of the merling gene. When Double Merles are bred to Non-Merled dogs, the defects are not passed on. These are some Double Merles which appear to be perfectly normal in sight and hearing and have a considerable amount of color in the body coat but they still produce as Double Merles. In a Merle to Merle breeding, the Non-Double Merle littermates are of normal coloring and are not defective.

The Double Merles are invaluable in a AOAC breeding program. It is suggested that doing a breeding which would produce Sable Double Merles should not be done. Their chances of being defective are great, which would make them very difficult to place as a family pet. It is unwise to use them for breeding because of the high percentage of Sable Merles which would be produced.

The recommended breeding for the Black Double Merle would be to a black dog. All of the resulting puppies should be blue. On very rare occasions, this breeding can produce a black puppy. We have no explanation for this; perhaps, the geneticists have.

Double Merles should not be confused with Color-Headed Whites, which are the result of doubling on the white-factoring gene.

WHITE-FACTORING

This factor controls the amount of white on the body excluding the collar. The collar, chest, face blaze, leg markings and the tip on the tail are caused by a different combination of genes called IRISH PATTERN. The Irish Pattern seems to be inherited separately from the white-factoring. There are, however, many white-factored individuals who do have large white stifle bands and big shawl collars while their non-white-factored littermates are very plain. This could indicate some sort of linkage of the Irish Pattern and White-Factoring. White stifle bands are a good indication that a dog is carrying the white factor gene. The absence of white on the stifle does not definitely mean that a dog is non-white-factored.

When breeding two white-factored dogs, the chances of getting Color-Headed Whites with varying amounts of body-spotting are one in four. The white-factored Whites have colored heads and are not defective from doubling on the white-factoring. Color-Headed Whites should never be confused with Double Merles. White factoring is responsible for the lovely white Collie seen in the show ring. Perhaps, some day, we will be able to show our beautiful Color-Headed White Shelties.

SABLES

Sables are dominant over all other colors. They vary in color from golden to dark mahogany. The pure-for-sable (both color genes being sables) can produce nothing but sable regardless of which color it is bred to. Sables, who are black-factored, can be either tri-factored or bi-factored but NOT BOTH—remember, only two color genes per dog. The dog is Sable so we know that one of the genes has to be a sable one. The other gene can then be EITHER a tri or a bi gene.

SABLE MERLES

Sable Merles are the product of coupling a merling gene with a sable gene, e.g., Sable to Blue, Sable Merle to Black. This breeding should be reserved for breeders who are conscientious enough to make sure that Sable Merles are not used for breeding by people who are not students of the breed nor fully understand the inheritance of the merling gene. No matter what the color of the dog is, breeders who care will not allow pets to be bred.

The chance one takes when making a breeding of this kind is that the Sable Merles may have blue or merled eyes, which eliminates them from the show ring. There are, however, beautiful champion Sable Merles with brown eyes. It is very important that Sable Merles be identified as such on their registration papers. There should be no question who these dogs are.

The Non-Merled Sables from these litters are genetically the same as Sables from other Sable breeding, i.e., Sable to Tri or Sable to Sable.

BLACKS

Blacks come in a variety of combinations: With tan, called Tricolors; without tan, called Bicolors; diluted and merled with tan, called Blue Merles; diluted and merled without tan, called Bi-Blue Merles; and Double Merles with and without tan. A separate gene produces the tan pattern on the face and the legs of the Tricolors and Blue Merles.

TRICOLORS (black, white and tan)

These animals can either have two genes for tri which would, in essence, be pure-for-tri or they can have one gene for tri and one gene for bi., i.e., bi-factored tri. The tri gene is dominant over the bi gene, so when the tri/bi combination occurs, the color of the dog is always tri.

BICOLORS (black and white)

The bi gene is recessive to all other combinations. It must couple with another bi gene in order to be expressed—therefore, a Bicolor has two bi genes. It can be carried recessively in the Sable as well as in the Tricolor. The first modern Bi-Black champion was crowned in 1976. In as much as the bi gene has been around since the beginning of the breed, this would indicate that it had been carried unseen for generations, rarely finding a like gene to express itself.

It appears that the "SMUT GENE," which is responsible for mudding up sable coats, darkening faces, and making the tan points on the Tris and Blues smutty-looking, is independent from the bi gene. There are bi-factored individuals who also carry the "smut gene" and indeed, do produce all of the above faults. This has caused the bi-factoring to be blamed for contributing these undesirable traits. This is incorrect! ! There are many non-bi-factored individuals including Sables who are also "smut-factored." The bi-factored dogs who do not carry the "smut gene" do produce clear coat colors and clear tan points. The tan on the bi-factored Tris and Blues usually is diminished but not necessarily smutty. Some of the clearest tan and reddest coats that we've seen are bi-factored.

BLUE MERLES

There is no such thing as a blue color gene—remember there are only two color genes, sable and black. Blues Merles with tan are merely Tricolor (Blacks with tan) with the merling gene diluting the black coat to blue in a merled pattern. The merling gene is dominant so in order to produce blue puppies, one parent must be a merle.

BI-BLUE MERLES

Bi-blue merles are simply Bi-blacks merled to blue.

DOUBLE MERLES (BLACK)

These can be Tricolors, Bi-factored Tricolors, and Bicolors, all with a double dose of the merling gene which causes them to be white. Don't forget, these Double Merles are black dogs, diluted twice.

This chart is based on POSSIBILITIES, not probabilities. Possibilities merely tell you what colors are possible in a given breeding. Probabilities are based on 100 puppies produced from the same breeding, giving you a percentage breakdown on the colors expected based on those 100 puppies.

DEFINITION OF TERMS

Pure-For-Sable	Two sable genes
Tri-Factored Sable	One sable gene and one tricolor gene
Bi-Factored Sable	One sable gene and one bicolor gene
Tricolor	Two tricolor genes
Bi-Factored Tricolor	One tricolor gene and one bicolor gene
Bicolor	Two bicolor genes
Pure-For Sable Merle	Two sable genes and one merling color gene
Tri-Factored Sable Merle	One sable gene, one tricolor gene and one merling gene
Bi-Factored Sable Merle	One sable gene, one bicolor gene and one merling gene
Blue Merle	Two Tricolor genes and one merling gene
Bi-factored Blue Merle	One tricolor gene, one bicolor gene and one merling gene
Bi-blue	Two bicolor genes and one merling gene
Pure-For-Sable Double Merle	Two sable genes and two merling genes
Tri-Factored Sable Double Merle	One sable gene, one Tricolor gene, and two merling genes
Bi-Factored Sable Double Merle	One sable gene, one bicolor gene and two merling genes
Tricolor Double Merle	Two tricolor genes, and two merling genes
Bi-Factored Tricolor Double Merle	One tricolor gene, one bicolor gene and two merling genes
Bicolor Double Merle	Two bicolor genes and two merling genes