

THE MERLE GENE IN PYRENEAN SHEPHERDS

Merle Pyrenean Shepherds

As in many other breeds, the Pyrenean Shepherd is a breed that includes the distinctive merle color pattern. In France and many other European countries, this color is limited to blue merle (called harlequin in France). The standard in the US allows for “merles of diverse tones”, which includes blue merles, brindle merles, and fawn merles.

The merle gene is not a color, but is a modifier of color. A black dog diluted by the merle gene will be a blue merle; a brindle dog diluted by the merle gene will be a brindle merle; a fawn dog diluted by the merle gene will be a fawn merle.

While this gene brings with it a unique color palate, it also comes with some challenges if not understood properly. Therefore it is important for owners and breeders to educate themselves about the merling gene.

So What is the Trouble with Merle?

As in all other breeds that have the merle gene, in the Pyrenean Shepherd, **one copy of the merle gene creates the unique merling pattern we enjoy**, but **two copies of the merle gene results in homozygous (or double) merles that are associated with severe health defects**. These defects may even result in dogs that are blind and deaf. Because of these often heartbreaking defects, it is important to understand the implications of purchasing a homozygous merle, or of breeding two merle dogs together.

How Do I Know if My Dog is a Merle?

One of the challenges in this breed can be in identifying merle dogs. Adult merle Pyr Sheps may be difficult to identify, due to the graying gene that most Pyr Sheps carry, that can fade out the various coat colors. This is especially true with adult fawn merles, since their base color is light to begin with, then is diluted by the merle gene, then may be faded out further by the graying gene. These adult merle dogs can sometimes be identified by “freckles” of color visible near the nose, but this varies from dog to dog. Merle dogs may also have blue or partially blue eyes, but merle dogs do not always have blue or partially blue eyes. The easiest time to identify merle puppies is at birth, and is the most accurate when done by experienced breeders.

The amount of merling can also vary from dog to dog. A dog can genetically be a merle and have just one merle hair! Dogs that are docked may have had the only area of merling docked as well, making them visually unidentifiable. While these situations are rare in merles, they do occur, and it may only become evident if the dog is bred, and produces merle puppies.

(Homozygous merles are evident by their bodies typically being 1/3 to 1/2 white, and may not be shown in the US or in other countries.)

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What Should I Know as a Breeder?

Merles bred to solid colored dogs will not produce homozygous merles and the related health defects. But, merles bred to merles will result in a percentage of homozygous merle puppies being born that will be identifiable at birth by excessive white markings. These puppies will usually have varying degrees of eye defects and hearing defects that will not be evident until later. To avoid producing these defects, breeders should choose not to do merle to merle breedings, unless they are prepared to euthanize these homozygous merles at birth.

Is the Merle Gene in Pyr Sheps Different than in Other Breeds?

The merle gene in Pyrenean Shepherds is the same gene found in other breeds with the merle gene, and comes with the same associated health defects in homozygous merles.

See the following study: Merle Patterning <http://www.pnas.org/content/103/5/1376.full.pdf> for more information. In addition to this study there are CERF exams verifying that the associated eye defects do indeed occur in homozygous merle Pyrenean Shepherds. Of course, as in any breed, there are occasionally homozygous merles that do not have the associated health defects.

Basic Merle Genetics

All genes come in pairs – one from each parent. Any dog with one merle gene will be a merle.

Solid Color Dogs: mm Merle Dogs: Mm Homozygous Merle Dogs: MM

Solid dog (mm) x solid dog (mm):

100% solid (mm) puppies

Solid dog (mm) x merle (Mm):

About 50% solid (mm) puppies - 50% merle (Mm) puppies

Merle dog (Mm) x merle dog (Mm):

About 25% solid (mm) puppies - 50% merle (Mm) puppies - 25% homozygous merle (MM) puppies

Homozygous merle (MM) x solid dog (mm):

100% merle (Mm) puppies

Homozygous merle (MM) x merle dog (Mm):

About 50% merle (Mm) puppies - 50% homozygous (MM) merle puppies

If a dog has a merle parent – it may be a merle.

If a dog has a homozygous parent – it will be a merle.