

## Merle...not so simple

When discovering Aussies the first thing many learn is they come in merles and tris/bis. Many breeding still simply know not to cross a merle to a merle. That is about as far as their knowledge of the topic goes. But the topic of merle is an extremely in depth one. You have your non merles, cryptic merles, cryptic+, atypical, atypical+, merles, and then your harlequins.

**Non merles (m)** typically have 199-200 base pairs. They have no changes to their coat coloration. They are your tri/bi/self colored dogs.

**Cryptic merles (Mc)** have 200-230 base pairs, they show no differences from that of non merles. When crossed with a merle they can produce the “tweed” pattern.

**Cryptic+ merles (Mc+)** range from 231-246 base pairs, they also show no coloration differences from non merles. When crossed with merle this cross can produce the widely known “tweed” pattern.

**Atypical merles (Ma)** range from 245-254 base pairs. They can appear non merle, or have a diluted coat coloration. A black tri may appear a brown/red color. Eyes can be blue at this length without being a blue eyed tri. Crossed with a merle this can cause white body splashes, diluted patches, and may produce “Tweeds.”

**Atypical+ merles (Ma+)** range from 255-264 base pairs. This is where a merle pattern can be expressed. At this range it is a faint pattern which almost appears as if a film were placed over it. Others in this range may appear as a tri or diluted coloration to a brown/red color. Eyes can also be blue due to this range. Crossed with a merle they often will have extended white areas, white heads, and diluted coloration. There is a much higher risk of producing the health problems seen homozygous merles at this range, especially when the base pairs reach closer to the upper end.

**Merles (M)** range from 265-268 base pairs. This is the range that our “normal” merles are in. They have their “black/gray” patterns we know as blue merles or “red/cream” patterns we know as red merles. Eyes are pattern dependent at this range and can even appear marbled. It is widely known not to cross merles together as they produce “double merles” which can be deaf, have eye deformities, and neurological abnormalities.

**Harlequin merles (Mh)** range from 269-280 base pairs. These can be expressed in three ways, the widely known two being “herding harlequins” with the different colorations and flashy markings or those with white body splashes and flashy contrasting markings. Harlequin merles can also be expressed as minimal merles. When bred to Mc+ or higher there is a much higher risk of excess white. They should not be crossed with piebald. Dogs on the upper end of harlequin alone can appear as “double merles.” It is recommended to be cautious selecting breeding pairs in this range.

This gets infinitely more complex when you add in the combination possibilities, the fact that basepairs can shorten/lengthen when developing. Typically not by a whole range, but a merle may produce an atypical+ merle due to shortening or the merle sine. To complicate things more, dogs can have more than 2 different merle genes. They can have 3 or 4 different copies of merle (Ie: M/Ma+/Mc/m).

\*Base pair counts are based on **Vemodia labs** values.