



The Inheritance of Dobe Marks

by Peggy Ernst

It was a perfect natural delivery. No complications, everything progressed like clockwork. The last puppy was born at 5:25 AM. Six beautiful healthy puppies ranging from 10.8 oz to 13 oz. All of the puppies had their colored collar. We had 5 females and 1 male. Only one puppy had a very small spot of white. All of the puppies are now dry, have full bellies and are sleeping contently by Lolly. Now it is time for pictures. I lined the camera up on the Orange Collar puppy, clicked, and looked at the screen. WHAT IS THIS! WHERE DID THIS COME FROM! DOBE MARKS! The camera intensified the markings. You could not miss them. I began examining each puppy very carefully. The Orange, Lime Green Females and the Blue Male all have tan markings. Needless to say, I am shocked. My first thought is to call UC Davis. This is a color; there must be a DNA test for this. I talked with the expert in this area. I am writing this article to share what I learned since I had never seen this information before.

Most of us have probably heard of the Agouti gene where the a^t variant is bicolored-Dobe marks (Mark of the Hound) and the a variant is recessive black (solid color - no pattern). The a^t variant is dominant over the a variant, therefore if this was the only gene that determined Dobe marks in Weimaraners, any Weimaraner with one copy of the a^t variant would be Dobe marked. However, a different gene determines if you will see Dobe marks on your Weimaraner. This gene is named Dominant Black (K locus). Dominant Black masks the Agouti gene. For Dominant Black a K means the mutation is present, and N means the mutation is not present. The K mutation is dominant to N. If your Weimaraner has a result for Dominant Black of K/K the Dobe marks are masked. If your Weimaraner has a result for Dominant Black of K/N the Dobe marks will usually be masked, but not in all cases. There is an unknown third factor that comes into play in some Weimaraners where a dog that is K/N might have light tan markings that "LEAK" through, usually in sun light, if they also carry at least one a^t variant. A Weimaraner with a Dominant Black result of N/N and at least one a^t variant will display Dobe marks. A DNA test for Dominant Black and Agouti is available for Weimaraners. We have only tested a relatively small number of Weimaraners from different pedigrees, but thus far all of them have carried at least one copy of the a^t variant. There are probably some Weimaraners that have the a variant for Agouti, but Dominant Black is the gene that really determines if we will see the Dobe marks on our Weimaraners.

The two DNA color tests that you should run is - Dominant Black & Agouti - I used VGL UC Davis for the test.

Dominant Black Gene Influence on expression of Dobe marks

K/K bred to a K/K would only produce K/K offspring (No Dobe marks visible regardless of the Agouti gene)

K/K bred to a K/N could produce both K/K and K/N offspring

K/N bred to a K/N could produce some K/K, K/N and N/N offspring

N/N dogs are the ones that will show the Dobe marks if they carry at least one Agouti a^t variant

K/N dogs have the possibility of Dobe marks that "LEAK" through in a certain light if they carry at least one Agouti a^t variant

A result for Agouti of a/a (recessive black) will not show Dobe marks, even if the dog is N/N for Dominant Black.

A result for Agouti of a^t/a or a^t/a^t will show Dobe marks if the dog is also N/N for Dominant Black.

My litter had a K/N and a^t/a^t bred to a K/N and a^t/a^t . We ended up with 3 puppies (Dobe marked) N/N and a^t/a^t and 3 puppies K/N and a^t/a^t (No Dobe marks).