Dachshund Genetics:

A good breeder of any dog must know something about genetics. This page is to help those that breed as a rare hobby or those that have a kennel and wish to learn more. Genetics are essential to bettering the breed. Knowing what diseases can be carried or what color and/or pattern combinations can negatively affect the breed are examples of why genetics are so important. With such a variety of colors in the dachshund, there is a great deal to learn. I do not know everything but I am always researching to improve my knowledge and breeding practices. Some colors pose a health risks and we choose not to take those risks. Our goal is to produce healthy puppies above all and that should be the goal of any one attempting to breed.

Every dog is made up of the same gene groups. These genes individually are called alleles and are classified in groups called Locus. The difference in the various breeds of dogs is whether there is any variation in each Locus. As you look into Dachshund genetics, you will see that all of these Loci have some variation. Below will be each Locus explained and any variation to this breed.

But first, you need to understand the lingo of genetics and the basic truths if you are to ever understand what’s going on. You also need to understand that genetics are not guarantees, they are statistical probabilities. Example: We know this to be truth, puppies are either male or female - there is no gray area. We know that there is a 50% chance of having either a male or a female. That doesn’t mean that 3 out of a litter of 6 will be female. There are no guarantees. There are many genes that contribute to a dogs color and pattern and they play on each other, so the possibilities are endless. Expectations are educated guesses. The great thing about genetics is the surprise or the gratification of educated guesses being correct.

Language:

**Allele:** A part of a gene. Every Dachshund has 2 alleles in each gene category, one inherited from each parent. These alleles determine, in their combined state of 2, hair types, colors and patterns.

**Locus:** A gene category name. Consists of a group of alleles that play dominant and recessive to each other.

**Dominant Gene:** Visible on the dog and will show with only 1 allele from 1 parent, can not be carried.

**Recessive Gene:** Only visible with 2 alleles, one from each parent. Will not show if overpowered by a dominant gene. Can be carried.

**Incompletely Dominant Gene:** A gene that is dominant and will show but can be altered by another gene that is recessive.

**Incompletely Recessive Gene:** A gene that is recessive and alters a dominant or other recessive gene. It does not show other than the results of the gene alterations.
**Facts:**

**Genes that can not be carried:** Dominant Red (Agouti Category (A)), Full Pigmentation (Blue Dilution (D) and Chinchilla Dilution Category (C)), Brindle (Extension Category (E)), Dapple (Merle Category (M)), Solid Color (White Spotting Category (S)), Ticking (Ticking Category (T)).

**Genes that can be carried:** Tan Points (Agouti Category (A)), Black and Chocolate (Brown Category (B)), Chinchilla Dilution (Albino Category (C)), Blue Dilution (Blue Dilution Category (D)), Normal Coat and Clear Recessive Red (Extension Category (E)), No Dappling (Merle Category (M)), Irish Spotting, Piebald and Extreme White (White Spotting Category (S)), No Ticking (Ticking Category (T)).

Some of these genes that can be carried are only carried to one other gene. These are what I call the "middle genes". They are dominant and recessive.

Sable/Wildboar is recessive to Dominant Red and dominant to Tan Points (Agouti (A)), Black is recessive to Dominant Red from Agouti (A) but dominant to Chocolate (Brown (B)), Normal coat is recessive to Brindle but dominant to Clear Recessive Red (Extension (E)).

Dachshunds come in Smooth, Wire and Longhair.

**Dachshund Colors**

Red

Wild Boar/Sable (depending on hair type)

Wheaten

Recessive Red

Black and Tan

Chocolate and Tan

Cream

Blue and Tan

Isabella and Tan
Dachshund Patterns/Markings

- Dapple
- Double Dapple
- Piebald (ticking and non)
- Brindle

Or a combination of two

Agouti Category (Locus A)

Dominant Red (As) = This is the most dominant color gene. It is dominant to pretty much every color, Sable and Tan Points, including other color categories.

AsAs or Asay or Asat

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Wildboar/Sable (ay) = Wildboar/Sable is recessive to Dominant Red and dominant to Tan Points. Being dachshunds can only be sable if they are long hair. It has been stated that Sable can not be carried but according to this it can, only to Dominant Red.

ayay or ayat

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Tan Points (at) = Tan Points are recessive to Dominant Red. This is why most red dachshunds do not have tan points but can appear to have a lighter shading where tan points should be when carried. Tan Points are incompletely recessive to Wildboar/Sable. That is why some Wildboars/Sables have tan points and some do not. If the dog carries both alleles for tan points, the Brown Category will take over as a dominant color and that’s how you get a Black or Chocolate and Tan. It is believed that some other gene is responsible for the instance of a solid black or solid chocolate dachshund. It overpowers the tan points.

atat

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**Brown Category (Locus B)**

Black (B) = Black is dominant to chocolate in the Brown category but recessive to Dominant Red (R) in the Agouti Category and recessive to Clear Recessive Red in the Extension Category.

BB or Bb

Chocolate (b) = Chocolate is recessive to all other colors in the Agouti, Brown and Clear Recessive Red from the Extension Category.

bb

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These 2 Categories, Albino Dilution and Blue Dilution, effect Agouti, Brown and Clear Recessive Red from the Extension Category. They determine if you see the basic colors above or change into different colors based on the colors above.

**Albino Dilution Category (Locus C)**

Full Color (C) = Full Color is dominant to Chinchilla Dilution. Chinchilla Dilution can produce very light reds if 1 allele is Chinchilla Dilution.

CC or Ccch

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Chinchilla Dilution (cch) = Chinchilla Dilution is recessive to Full Color, producing light reds if one allele is Chinchilla Dilution and creams as 2 alleles are Chinchilla Dilution. Chinchilla Dilution has no effect on black (hair, nose or nails) but does effect Tan Points. That's why creams have black nails and noses and it is possible to have a black and cream; the cream overpowers the tan points.

cchcch

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**Level Of Pigmentation (Locus D) Blue Dilution Category**

Intense Pigmentation/Full Color (D) = Full Color is dominant to Blue Dilution. Blue Dilution effects black pigment so a Black and Tan that carries Dilution; has 1 dilution allele, may have a liver/bluish colored nose. Can result in very deep rich color such as a mahogany.

DD or Dd

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Light Pigmentation/Blue Dilution (d) = Blue Dilution is recessive to Full Color. Blue Dilution does not effect tan points but does effect black and chocolate pigment creating a blue or isabella with tan points.

\[ dd \]

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Extension Category (Locus E)

Super Extension Mask (Em) = This is dominant to all other genes in this series. This produces a black mask on the face area. This is not likely in a dachshund.

\[ EmEm \text{ or } EmE \text{ or } Emebr \text{ or } Eme \]

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Solid Color (E) = Normal color is dominant to Clear Recessive Red and to Brindle. Normal color includes all base coats and can have mixed black hairs within.

\[ EE \text{ or } Eebr \text{ or } Ee \]

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Brindle (ebr) = Brindle pattern is dominant to Normal Color and Clear Recessive Red. Brindle can occur in any color and effects tan points with black stripes. In a Black and Tan, the Brindle will only show up in the tan points. It has been said that brindle can not be carried but here shows that it can and I have seen brindle pups come from 2 non brindle parents.

\[ ebrebr \text{ or } ebre \]

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Clear Recessive Red (e) = Is the recessive gene of this group. This makes a red color have no black in their coat at all, totally red and usually a light color but can range to very dark. Recessive Red is dominant over the Brown Category when having both recessive alleles

\[ ee \]

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Graying (Locus G)

Graying (G) = Graying takes place steadily over the period of the dogs life.

GG or Gg

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Non-Graying (g) = Recessive, dog does not gray over time.

gg

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Merle Category (Locus M)

Dapple (D) = Dapple pattern is dominant to having No Dapples. When the sire gives a dapple gene and the dam gives a dapple gene, it produces a double dapple. Double Dapple can cause puppies to be blind or deaf. Dapple can not be carried.

DD or Dd

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Non-Dapple (d) = No Dappling is recessive to Dappling.

dd

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White Spotting Category (Locus S)

Solid (S) = Solid is dominant to any type of Piebald pattern; Irish Spotting, Piebald, and Extream White.

SS or Si or Sp or Se

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Irish Spotting (i) = Is incompletely recessive to Solid. This is where you have the required white to be a piebald but no white crosses the back between the neck and withers.

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Piebald (p) = Is incompletely recessive to Solid. Piebald must be more than 50% white. The white is on the neck, chest, all 4 legs, the underbody and tail tip.

pp

Extream White (e) = Is incompletely recessive to Solid. The entire body is white except the head.

ee

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**Ticking Category (Locus T)**

The ticking category on affects piebalds

Ticking (T) = Ticking is dominant on a piebald. Ticking is small spots of color in the white portions. Can not be carried

TT or Tt

Non-Ticking (t) = Non-Ticking is recessive to Ticking pattern on piebalds.