

The Truth about Blue Dog Syndrome

**What is
Color Dilution Alopecia?
How is color dilution
Alopecia inherited?
What does this mean to
your dog?**



Inherited skin disorders.

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Affected dogs, their parents and
siblings should not be used for
breeding. The condition can be
entirely avoided by the use of non-
color-diluted dogs in breeding
programmes.

COLOR DILUTION ALOPECIA

By Teri Dickinson, DVM

Alopecia (hair loss) related to dilute coat color is a recognized condition in dogs. The currently accepted medical terminology for this condition is Color Dilution Alopecia (CDA). The condition may affect any dilute pigmented dog, regardless of coat color. This condition was previously known as Blue Balding Syndrome, Blue Doberman Syndrome, Color Mutant Alopecia, Congenital Alopecia, etc. The term Color Mutant Alopecia arose because dilutes were at one time mutations from the deep pigment occurring in wild canines. Dilutes are now a regularly occurring form of pigmentation in many breeds and have been for hundreds of years. The term mutation is therefore not applicable to dilute individuals. References to Doberman Pinschers or blue hair coats arose because the condition is common in blue individuals of this breed, but it is not limited to either blue dogs or Dobermans. The term congenital means present at birth, but CDA affected dogs are born with normal hair coats.

The dilute (also known as Maltese) gene also appears in both mice and cats, and interestingly enough, is not associated with any abnormal coat conditions in those species. Color Dilution Alopecia (CDA) has been recognized in dilute individuals of many breeds of dogs including Chow Chows, Dachshunds, Doberman Pinschers, Great

Danes, Irish Setters, Italian Greyhounds, Standard Poodles, Salukis, Whippets, and Yorkshire Terriers. Dilute individuals carry a recessive genotype of dd and are characterized by blue, bluish-grey, lavender or flesh-colored noses, lips and eye rims. The coat colors may include blue, fawn, blue-fawn, bronze, taupe or some variation of these. These dogs are usually easily distinguished from their deeply (non-dilute) pigmented counterparts. Deeply pigmented individuals carry a dominant genotype of Dd or DD and have black or liver noses, lips and eye rims. Coat colors may include black, red, red-fawn, liver or variations thereof.

CDA is characterized by loss of hair from dilutely pigmented areas. Coats are normal at birth, and onset of hair loss usually begins between six months and three years of age. Hair loss usually begins along the dorsal midline (middle of the back) and often spares the head, tail and limbs. The pattern seems to vary from breed to breed. It has been suggested that darker colored (steel blue) individuals are less likely to be affected, may be less severely affected or may start to lose hair later in life than lighter colored dogs.

This suggests that the severity of the disease may be related to the amount of dilution present. Deeply pigmented or white areas of coat are unaffected. In blue dogs with tan points (Yorkies and Dobermans) the tan areas retain a

normal appearance. In piebald (white spotted) individuals, the white areas are unaffected by the hair loss. The hair loss may be total or partial and any remaining hairs are usually sparse, rough and easily broken or removed. The skin in the affected areas is usually scaly and may occasionally develop bacterial infections. Pruritus (itching) is usually absent, unless a bacterial infection has set in.

Diagnosis of CDA requires first ruling out other causes of hair loss. Diagnostic tests should include fungal cultures, skin scrapings to check for parasitic mites, etc. CDA often closely resembles endocrine (hormone related) hair loss and the dog should be carefully examined for any other abnormalities, and tested for normal thyroid function. Presence of dilute pigment and a characteristic course of disease also aid in making the diagnosis. Microscopic examination of hairs and/or skin biopsies can be used to confirm the diagnosis.

There is no cure for CDA. Treatment is limited to controlling the scaliness and any associated pruritus with various shampoos or topical treatments.

The cause of CDA is not clearly understood. Microscopic examination of hairs of dilute individuals reveals that the pigment (melanin) forms large granules (macromelanosomes) which are rarely found in deeply pigmented hairs. In dilute individuals with normal appearing coats, these macromelanosomes are not grouped or clumped and cause no distortion of the cuticle (outer covering) of the hair. Dogs with CDA have many large groups or clumps of macromelanosomes which tend to distort the cuticle of the hair. It is hypothesized that this

distortion of the cuticle causes the hairs to break easily, resulting in the short stubby hairs commonly found in affected individuals. (See Drawing). It is further hypothesized that the rupture of the hair releases by-products of pigment formation, which are toxic to the hair follicles. Re-growth of broken hairs is reduced because of damage to the follicles caused by these toxins.

Why in some dilute dogs the macromelanosomes are clumped and in others they are not, is an interesting question at this time. The relationship between dilute pigment and hair loss is clear, but why are some dilute individuals unaffected? Weimaraner as a breed are dd, all individuals are dilute, yet the disease is unreported in this breed. In Dobermans, the dilute individuals comprise only 8-9% of the breed, yet 50-80% of the dilute dogs have CDA. In Italian Greyhounds, many individuals are dilutes, yet the IGCA health survey reported only 71 affected individuals among the approximately 2200 dogs included in the survey. If half the dogs included in the survey were dilutes, the incidence of CDA in IG's would be around 7% of the dilute population, as opposed to the 50-80% affected dilute Dobermans. A third allele (dl) which is associated with CDA has been proposed. While this is a long way from being proven, it could help explain why some dilute animals are unaffected. Dogs with a genotype dd would be normal coated dilutes, ddl would be intermediates (mildly affected?) and dldl would be CDA affected. A genotype of Ddl should represent deeply pigmented dogs which were carriers of CDA.