

## Color Genetics of the American Chinchilla Rabbit

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The Chinchilla is one of the more striking breeds, with its characteristic coat pattern being displayed in five rings of color seen by blowing on the fur. The chinchilla color was developed between 1900 – 1950.

The vast majority of genes that affect coat color are located on lonely four pairs of chromosomes. These genes have been categorized into a system referred to as the coat color series. And are labeled A B C D E (agouti, brown, color, dilution, and extension).

The American Chinchilla breed genotype is  $A\_B\_CchdCchd D\_E\_$ . This genotype is also present in the Standard Chinchilla and Giant Chinchilla Rabbit breeds. The American Chinchilla would also be considered to have the agouti phenotype because of the large A in its color genetics. The agouti phenotype is the result of black pigments being distributed in the terminal band region, red pigment in the intermediate band region and black pigments distributed in the base of the hair shaft. Agouti markings predominate throughout the head, back and sides of the body coat, while the eye circles, under jaw, nape of neck, belly and undersurface of the feet and tail are white or cream in color.

The Standard of Perfection 2006 American Chinchilla Rabbit allocated 25 out of a total of 100 points to the color of the Chinchilla fur. The color is further divided into undercoat – 5 points; ring color and definition – 8 points; and surface color – 12 points.

The Standard of Perfection 2006 American Chinchilla states that the color is to resemble real Chinchilla. The under ring color is to be dark slate blue at the base, which relates to the agouti “black pigments distributed in the base of the hair shaft”. The next ring is of pearl to be as light as possible, with the top edge being a very narrow black band. The base ring should be definitely wider than the intermediate band portion. Followed by a very light band and brightly ticked with wavy jet-black hairs to the beautiful Chinchilla surface color. Neck fur to be lighter in color than in the body, but strictly confined to the nape. The chest is to be lightly ticked with a uniform shade of pearl, slightly lighter than the body. The body color is to extend as far down the sides as

possible. Belly color next to the skin is to be white or blue. Outer or surface color of belly is to be white. Eye circles are to be well defined, narrow, and light pearl. Underside of tail is to be white. Topside is to be black, interspersed with white hairs. Ears are to be evenly ticked and match body color. Upper tip of the ear is to show a distinct narrow, jet-black lacing of approximately 1/16 inch. The front feet and the outside of the upper part of the hind legs are to be ticked with a uniform shade of gray, matching body as nearly as possible. Color is to run down the thighs to a narrow strip on the outside of the hind feet.

The eyes, which count for 2 points, are to be large, bright and bold of brown, blue-gray or marbled color. The Rabbit Production 8<sup>th</sup> edition states there are two eye-color versions of true chinchilla rabbits (Cchd Cchd) have marbled blue irises; those with light chinchilla color (Cchl Cchl) and the medium chinchilla color (Cchd Cchl) have brown irises.

A recessive gene that causes an increase in the width of the sub-terminal agouti band of the hair shaft is called the wide-band gene (w). It is found in the Belgian Hare and possibly in certain varieties of the Rex, Silver, and Tan breeds. The effect of the wide-band gene is to make the sub-terminal band colors more visible with less dark surface color. Chinchilla rabbits that possess the wide-band gene (genotype AA Cchd Cchd ww) may show no black surface color. These *ghost* chinchillas because of the excessive white pearling throughout the hair shaft. The base or undercolor remains a slate blue.

Since the C series of genes have an incomplete dominance, variations in the chinchilla ring coloration occur. Modifying genes, can also be involved in casting variations of ring color in the Chinchilla color as in other color breeds.

Color disqualifications for the American Chinchilla include: Hind feet lacking blue undercolor; white or unmatched toenails. Solid white spot(s); extremely light or dark color, or mixed brown patches, extreme brownish tinge in ring color, or absence of ring color.

When evaluating your breed stock for correct color, pay close attention to culling out the rabbits with definite color disqualifications.

### **References:**

1. Rabbit Production 8<sup>th</sup> edition by McNitt Patton Lukefahr Cheeke
2. Official Guide Book - Raising Better Rabbits & Cavies by the ARBA Inc.
3. Standard of Perfection 2006 by the ARBA Inc.