Coat Colour Inheritance Chart

Dogs Queensland Exclusive 🐾

Written by Lynda Trotter

The figures below are based on the probable percentages from a litter of four puppies in each possible mating. I do not claim to be an expert on the on the genetics of coat colour inheritance in the Belgian Shepherd Dog (far from it). I did however, want to set out a simplistic chart for those just learning to follow the topic. There are more combinations than those listed, but these will help give an overview of the genetics involved.

Please note that 'I locus' equates to 'I' from Intense. Recent studies have found that the C (for Chinchilla) series is not responsible for the dilution of canine coat colour. It is replaced by the 'I locus' that only affects the intensity of the pheomelanin pigment. This allele is not actually known, but is an hypothesis. For this locus, there are two alleles:

- 'Allele i' recessively decreases the pheomelanin pigment intensity. Co-dominant, so ii dogs are paler than Ii dogs. By the Belgian Shepherd, this is the case for the Tervueren sand (incorrectly called 'grey' – black overlay on a pale base coat gives the illusion of 'grey')

- 'Allele I' is fawn relative and not diminution of intensity

Alleles present in the Belgian Shepherd Dog

at the locus K	at the locus A
K^B : dominant black k^y : express whichever alleles are on its A locus	A^y : fawn (with black overlay) a : recessive black
Groenendael homozygote dominant black $K^B K^B A^y A^y$	Groenendael carrying one dominant black allele $K^B k^y A^y A^y$
Tervueren homozygote $k^y k^y A^y A^y$	Sand (grey) Tervueren carrying two recessive sand (grey) alleles $k^y k^y A^y A^y$ ii
Fawn Tervueren carrying one recessive sand (grey) allele $k^y k^y A^y A^y$ Ii	
Groenendael carrying one dominant black allele and one recessive sand (grey) allele $K^B k^y A^y A^y$ Ii	Groenendael carrying one dominant black allele and two recessive sand (grey) alleles $K^B k^y A^y A^y$ ii

Parent	Parent	Offspring
$K^B K^B A^y A^y$	$K^B K^B A^y A^y$	4 x $K^B K^B A^y A^{ya}$
$K^B K^B A^y A^y$	$K^B k^y A^y A^y$	2 x $K^B K^B A^y A^y$ and 2 x $K^B k^y A^y A^y$
$K^B k^y A^y A^y$	$K^B k^y A^y A^y$	1 x $K^B K^B A^y A^y$ and 2 x $K^B k^y A^y A^y$ and 1 x $k^y k^y A^y A^y$
$K^B K^B A^y A^y$	$k^y k^y A^y A^y$	4 x $K^B k^y A^y A^y$
$K^B k^y A^y A^y$	$k^y k^y A^y A^y$	2 x $K^B k^y A^y A^y$ and 2 x $k^y k^y A^y A^y$
KB ky AyAy ii	$k^y k^y A^y A^y$ Ii	1 x $K^B k^y A^y A^y$ ii 1 x K^B ky $A^y A^y$ Ii 1 x $k^y k^y A^y A^y$ Ii 1 x $k^y k^y A^y A^y$ ii
$k^y k^y A^y A^y$	$k^y k^y A^y A^y$	4 x kyky $A^y A^y$
$k^y k^y A^y A^y$	$k^y k^y A^y A^y$ Ii	2 x $k^y k^y A^y A^y$ 2 x $k^y k^y A^y A^y$ Ii
$k^y k^y A^y A^y$ Ii	$k^y k^y A^y A^y$ Ii	1 x $k^y k^y A^y A^y$ 2 x $k^y k^y A^y A^y$ Ii 1 x $k^y k^y A^y A^y$ ii
$k^y k^y A^y A^y$ ii	$k^y k^y A^y A^y$ Ii	2 x $k^y k^y A^y A^y$ ii 2 x $k^y k^y A^y A^y$ Ii
$k^y k^y A^y A^y$ ii	$k^y k^y A^y A^y$	4 x $k^y k^y A^y A^y$ Ii

For the purpose of this article I will not cover the possibilities involving the recessive black gene, however for those who are interested more information on such combinations can be found at the link below.

References sources: Jean-Marie Vanbutsele, The late Lee Jiles (A heartfelt thanks to both of these wonderful and dedicated people for their help and assistance in my research on the Coat Colour Inheritance of the Belgian Shepherd)

To view online material related to this article visit:

www **Recessive black gene article**
http://www.ozbsd.com/coat-inheritance/coat-inheritance.html