

Dominance rules by hair types

The loci and the symbols used are the following:

a) **Locus L** (“*length*” - FGF5 gen located on chromosome 32) with two alleles:

L = short hair
l = long hair

b) **Locus Wh** (“*wire hair*” or “*rough coat*” - RSPO2 gen located on chromosome 13) with two alleles:

Wh^w = rough hair with “ <i>facial furnishings</i> ”
wh = smooth hair

1. Long hair

As in other dog breeds, short hair can produce long hair but long hair can never produce short hair. It means that long hair is recessive. Two long-haired dogs will always produce only long haired dogs. They can only be Groenendael or Tervueren, but never Malinois or black short-haired dogs.

In the same way, long hair never produces rough hair. As a consequence, long hair is completely homozygote as regards hair length.

Therefore, the genetic formula for long hair is: « ll, whwh »

2. Short hair

For short hair, it is simpler. In fact, as short hair « L » is dominant in connection with long hair « l », three cases can be observed:

a) Mating of two short-haired "homozygotes" (**LL + LL**)

x	L	L
L	L + L	L + L
L	L + L	L + L

In this case, we can only expect a short-haired dog.

b) Mating of a short-haired "homozygote" with a short-haired "heterozygote" (**LL + Ll**).

x	L	L
L	L + L	L + L
l	L + l	L + l

All the results will be short-haired, but only half of them will be « homozygotes ».

c) Mating of two short-haired "heterozygotes" (**Ll + Ll**)

x	L	l
L	L + L	L + l
l	L + l	l + l

From four products, one will be short-haired homozygote « LL » and another one long-haired homozygote « ll », and they will reproduce accurately. The other two will be short-haired heterozygote.

This is why a Malinois gives sometimes Tervueren. He carries the allele « l » for long hair, which he sometimes receives from distant ancestors and when by chance he is mated with a partner in the same situation, the long hair allele finds its equal and produces one Tervueren out of four in a litter, rarely two.

The genetic formula for short hair is: « (LL or Ll), whwh »

3. Rough hair

Rough hair is epistatic in relationship with short hair. It means that there is an interaction of dominance of rough hair allele in connection with short hair or long hair allele. But this interaction of dominance is not always complete. Short-haired may appear in a litter with rough-haired or the other way round. Undoubtedly, it has rough hair, shorter and less or no facial furnishings.

We can read from the following educational texts (published in *L'Aboi* on 1 september 1946):

« A good breeding animal with different rough-haired bitches gives birth to five litters always of good rough-haired puppies. In a sixth litter there are mostly short-haired dogs.

Such facts can not be considered as atavism, it is only a very common consequence of Mendel's law. Let us suppose that in one of the mentioned litters of good rough hair, there is still a newly born short-haired puppy. The breeder will be determined to eliminate this puppy. But it is just this short haired puppy who will be surely able to transmit rough hair through inheritance. Only a breeding experience will confirm it, but to assess the importance of the breeding parents, similar cases are really valuable. Therefore, when enrolling in a studbook it is advisable to enroll not only the « good » products, because to know how important the breeding is, only the enrollment of total carriers is taken into account. »

The genetic formula for rough hair is: « (LL or Ll), (Wh^wWh^w or Wh^wwh) »

The undercoat

Even though the rule for our Belgian shepherd states that all of them must have a down hair as protection from weather inclemencies, it is a fact that our Groenendael and Tervueren in general, are really hairy, the Malinois has less hair and rough-haired dogs often have almost nothing. The absence of down hair is dominant on normal down hair. This can sometimes explain less down hair density in the Tervueren coming from Malinois.

Jean-Marie Vanbutsele
Brakel, March 2013.