

Feline Analysis Report

Tested Animal Name's Tale





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1 Overview

Overview

Tested Aniaml Name's samples were submitted for a full set of genetic testing for cats, including breed identification, single-gene genetic disease detection, blood group detection and behaviour determination. The analysis of sample received for was completed and reported on 13, January, 2023.

Sample quality

DNA extraction was successful. The specific information is as follows:

Sample ID	Total Reads	Reads matched with primer	Effective average depth	Ontarget ratio	Q20
Lab. No.	5464350	4890275	5113.6762	0.8949	0.9780

Breed identification

In this test, the sample is a mixed breed of Ragdoll, Chartreux.



Ragdoll



Chartreux

Disease detection

49 feline single-gene genetic diseases was tested. 1 single gene mutation was detected in this sample.

Single-gene genetic diseases	Risk
Factor XII Deficiency	Carrier

Blood type of this sample is as follows:

Blood types	Result
B	
Non-B(A or AB)	✓





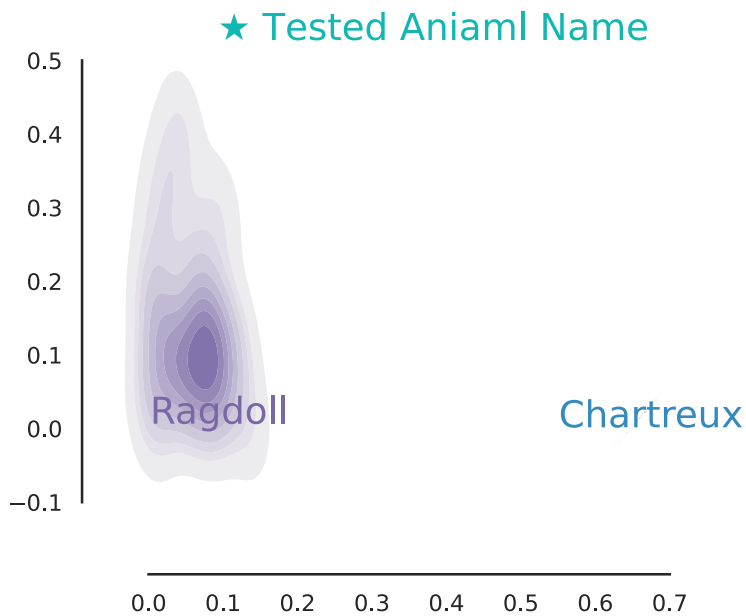
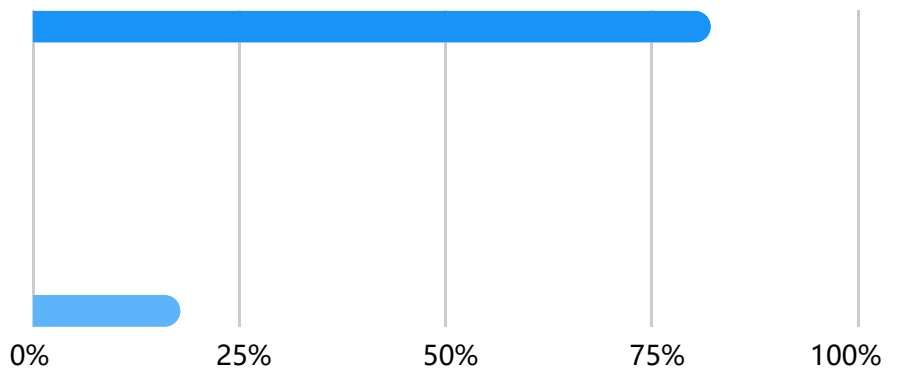
2.1 Breed

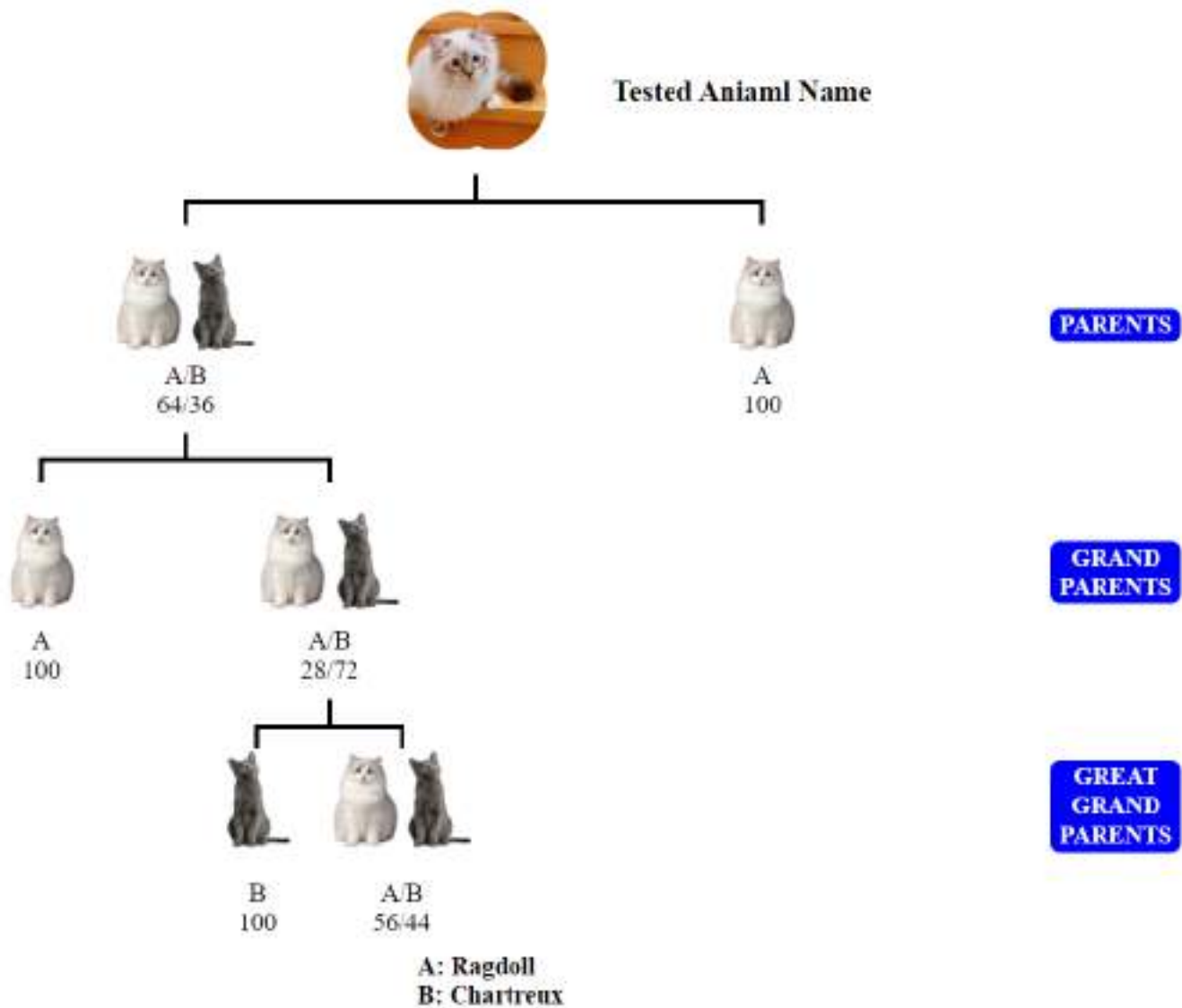
Breed Identification Report

Tested Animal Name is a mixed breed. The breed composition diagram is as follows:

82% Ragdoll

18% Chartreux





Please note, the family tree above only shows the most likely scenario according to laws of genetics. It's just for reference.

Variety Description

Ragdoll

Historical Origin

Ragdolls were developed by American breeder Ann Baker in the 1960s.

Characteristics

Ragdoll is a very intelligent breed. It is docile, serene, sociable, and gets along well with other cats or dogs. It barks softly, has rich feelings, is caring, likes to be accompanied by others, and is very friendly to people. Soft, tolerant, and very tolerant of people playing. Ragdolls like to please their masters and are always inseparable from their masters. This cat is very quiet, but also loves to play with toys and enjoys being involved in the daily life of the home. Ragdoll cats are very gentle and lack the instinct to protect themselves, so they must be kept as pets in the boudoir and not allowed to go out.

Anecdote

Ann Baker established a breed association, but the puppet cat at that time had not been recognized by other associations. Since then, many people have cultivated Muppet cats, which has created the Muppet cat variety now recognized by major mainstream associations.

Traits

Average Life Expectancy:15-25 years

Average Height:9–11 inches

Average Weight:3.6-9.1 kg



Variety Description

Chartreux

Historical Origin

It was first named in the middle of the 18th century in France.

Characteristics

The French blue cat, also known as the Chartreux, is sometimes called the monastery cat. This blue cat with copper-yellow eyes has a large, sturdy body in contrast with its slender limbs. Chartreux is also called the smiling cat.

Anecdote

In the 1920s, French breeding experts crossed this cat with Persian cat for breeding. In 1939, the standard of this cat was established in France.

Traits

Average Weight:3-7.5 kg (6-16 lb)





2.2 Genetic diseases

Single-gene disease detection report

Factor XII Deficiency (also known as Hageman deficiency) is the most common congenital coagulopathy in cats. The disease is caused by a single-base deletion mutation in the factor XII gene. The gene is located on the A1 chromosome and consists of 14 exons and 13 introns. A single-base deletion in exon 11 of this gene results in premature truncation of the factor XII protein.

Under Hageman conditions, activated partial thromboplastin time (APTT) and activated clotting time (ACT) are prolonged as the mutation affects the XII protein. This means that factor XII deficiency does not cause bleeding in the body, but only prolongs the clotting process. The disease rarely causes severe bleeding and generally does not require specific treatment. If bleeding symptoms occur, a small amount of fresh plasma can be considered as appropriate.

Items	Factor XII Deficiency
Test results	
Genotype	
Genetic model	Recessive
Heredity	100% probability of passing at least one mutation to the next generation
Risk interpretation	High risk

Despite prolonged clotting time, factor XII deficiency is usually asymptomatic. It does not exhibit bleeding tendencies like other clotting factor deficiencies. However, when a partial thromboplastin time test (PTT) and serum prothrombin time (PT) time test are performed on a cat's blood, the sample will take an unusually long time. Factor XII deficiency is usually discovered incidentally through preoperative blood tests.





2.3 Blood group

There are two main types in felines' blood group system. Antigens of type A and type B are N-glycolylneuraminic acid (Neu5Gc) and N-acetylneuraminic acid (Neu5Ac), respectively. Mutations in Cytidine monophospho-N-acetylneuraminic acid hydroxylase (CMAH) are associated with type B blood. CMAH determines the sugar bound to erythrocytes by converting NeuAc to NeuGc. Type AB red blood cells express both Neu5Gc and Neu5Ac.

Detection result: Tested Aniaml Name is a Non-B type cat, which indicates that either A or AB type. Genotype of related SNPs are as follows:

Gene	Site	Genotype
CMAH	I	N/N
CMAH	II	N/N
CMAH	III	N/N
CMAH	IV	N/N

****N/N:** No mutation, blood type A or AB, no blood type B gene, no genetic risk;;

****N/b:** Heterozygous mutation, type A or type AB, carrying a blood type B gene, which will be 50% possibility that pass to the next generation;;

****b/b:** Homozygous mutation, type B blood, carries two copies of the type B blood gene, which will be 100% possibility that pass to the next generation.

Breeding risk: Cats with non-B blood type may breed B blood type kittens. The milk of mother cats with a blood type contains anti-B antibodies. Although the attack ability is weak and not enough to cause hemolysis in B blood type kittens, but it will also occur and resulting in a certain degree of adverse reactions, such as tachycardia, shortness of breath and other symptoms. It is recommended to isolate and observe the mother cats and the kitten as soon as possible after delivery, and artificially feed the kitten to prevent the adverse reaction of breastfeeding.

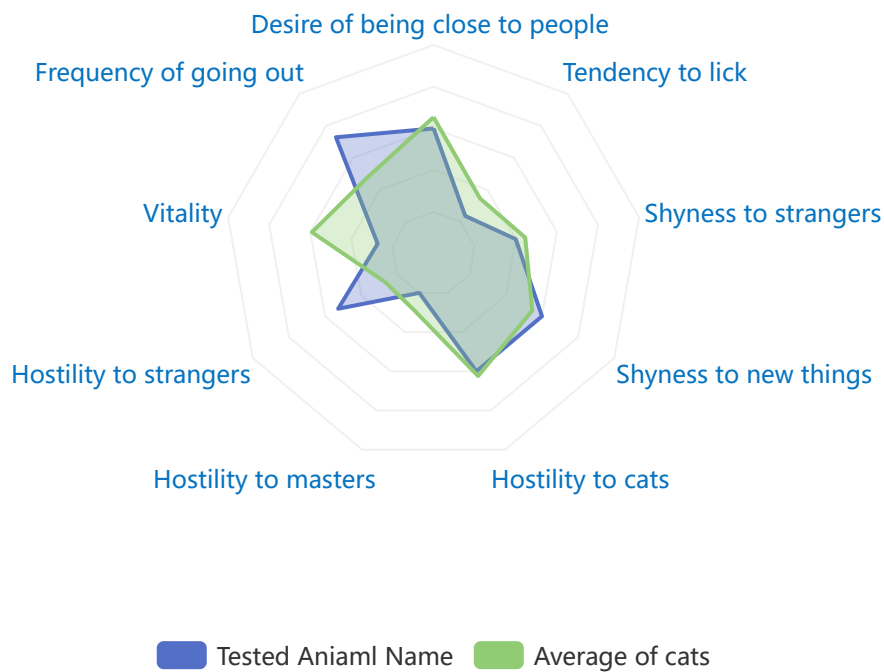
Blood transfusion risk: Transfusion of type B blood to type A or AB cats usually has relatively mild adverse effects, but symptoms such as tachycardia and shortness of breath may occur within minutes of the transfusion; transfusing of type A blood to cats with type B blood can cause serious adverse reactions: even with less than 1 mL of blood transfusion, can cause apnea, vomiting, diarrhea, shock, multiple organ dysfunction, disseminated intravascular coagulation, and other life-threatening symptoms. Cross-transfusion of blood types A, AB and B should be avoided to avoid transfusion reactions.

***Please note that the genetic test cannot distinguish between blood type A and type AB because of the limitations of science and technology.**



2.4 Behaviours

Behaviours determination



Desire of being close to people refers to the friendliness between cats and humans. The higher the score, the easier it is to get along with people, and the more natural and friendly they are.

Frequency of going out refers to the frequency of the cat going out. The higher the score, the higher the possibility of carrying it out, and the lower the response to being stimulated when going out.



Vitality refers to the activity of the cat, the higher the score, the more lively, energetic, and the more interesting and noisy personality, the greater the amount of exercise required.

Hostility to strangers refers to the cat's hostility to strangers. The higher the score, the greater the response to stimulation, and the easier it is to produce aggressive behavior.

Hostility to masters refers to the cat's hostility to the owner. The higher the score, the lower the obedience and the unwillingness to follow orders.

Hostility to cats refers to the cat's hostility to other cats. The higher the score, the more likely it is to produce aggressive behavior, regardless of combat effectiveness.

Shyness to new things refers to the cat's fear and anxiety about unfamiliar things. The higher the score, the easier it is to have fear or anxiety, and the higher the shyness.

Shyness to strangers refers to the cat's fear and anxiety towards strangers. The higher the score, the easier it is to have fear or anxiety, and the higher the shyness.

Tendency to lick refers to the cat's tendency to use licking behavior to relieve stress in addition to its own cleaning needs. The higher the score, the greater the stress, and the higher the need to release stress.





3 References

Single-gene genetic diseases:

- Glycogen storage disease IV
- Hypertrophic Cardiomyopathy
- Hypokalaemic periodic paralysis
- Cystinuria
- Polycystic Kidney Disease
- Retinal Degeneration
- Spinal Muscular Atrophy
- Pyruvate Kinase Deficiency
- Folded Ear and Osteochondrodysplasia
- Congenital Glaucoma
- Acute Intermittent Porphyria
- Autoimmune Lymphoproliferative Syndrome
- Brachycephaly
- Hyperchylomicronemia
- Congenital Erythropoietic Porphyria
- Hypotrichosis with short life expectancy
- Congenital Myasthenic Syndrome
- Dihydropyrimidinase Deficiency
- ✗ Factor XII Deficiency
- GM1 Gangliosidosis
- GM2 Gangliosidosis
- Hemophilia B
- Primary Hyperoxaluria
- Mucopolysaccharidosis I
- Mucopolysaccharidosis VI
- Mucopolysaccharidosis VII
- Myotonia Congenita
- Niemann-Pick Disease Type C1
- Niemann-Pick Disease Type C2
- Vitamin D-Dependent Rickets
- Progressive Retinal Atrophy
- Leukocyte adhesion deficiency, type I
- Inflammatory linear verrucous epidermal nevus(ILVEN)
- Neuronal Ceroid Lipofuscinoses(NCL)
- α -Mannosidosis
- Niemann-Pick Disease Type A(NPA)
- Chediak-Higashi Syndrome
- Congenital Hypothyroidism
- Rod-cone Dysplasia(Rdy)
- Simplex Epidermolysis Bullosa
- Cerebral dysgenesis
- Wilson disease
- Thrombasthenia
- Hypogonadotropic hypogonadism
- Fibrodysplasia ossificans
- Mucopolidosis II(ML II; I-cell disease)
- Ehlers-Danlos syndrome,classic type,1
- Leber congenital amaurosis(LCA)
- Vitamin D-Dependent Rickets type Ib

**✗: Carrier



Breed list:

- Abyssinian
- ✓ Ragdoll
- Devon Rex
- Oriental Shorthair
- American Shorthair
- Bengal
- Maine Coon
- Scottish Fold
- Siamese
- Exonic Shorthair
- British Shorthair
- Chinese Domestic Cat
- Persian
- Birman
- British Blue
- ✓ Chartreux
- Cornish Rex
- American Wirehair
- American Curl
- Burmese
- Norwegian Forest
- Sphynx
- Turkish Van
- Siberian

**✓ : Carrier





FELINE BREED COMPOSITION CERTIFICATE

Certified breed analysis and genetic makeup for

Tested Animal Name

BREED BREAKDOWN

Ragdoll – 82%

Chartreux – 18%

LAB SAMPLE ID – Lab. No.

CASE REF: y

13 January, 2023

