PETGEN CANINE 5 IN 1 REPORT

NAME: _____

LAB NUMBER: _____

OVERVIEW

001 sample was submitted for a full set of genetic testing for dogs, including breed identification, single-gene genetic disease detection, complex disease detection, hair trait and behaviour determination. The data analysis of the experimental results was completed on July 7, 2021.

Sample Quality

In the samples received in this batch, DNA extraction was successful. The specific information is as follows:

Sample ID	Total reads	Reads matched with primer	Effective average depth	On target ratio	≥20 floors
	2035772	1915887	1208.7615	0.9411	0.9780

Breed Identification

Based on the samples provided the results indicate this is a mixed breed of **Beagle and Foxhound.**

Disease Detection

133 canine single-gene genetic diseases were tested. One single gene mutation was detected in this sample.

Single-gene genetic diseases	Risk
Factor VII deficiency	Carrier
Complex genetic diseases	**Relative risk (%)**
Mast cell tumor	96.29
Osteosarcoma	89.68
Canine hip dysplasia	85.89
Congenital megaesophagus	65.48
Obsessive-compulsive disorder	57.02
Hemangiosarcoma	46.21
Lymphoma	31.85
Congenital Sensorineural Deafness	7.74
Portosystemic Vascular Anomaly	4.27
Mast cell tumor	96.29
Osteosarcoma	89.68

Canine hip dysplasia	85.89
Congenital megaesophagus	65.48
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Portosystemic Vascular Anomaly	4.27

A full set of disease were tested. including the following:

Single-Gene Genetic Diseases:

• 2-8-Dihydroxyadenine	• Alport Syndrome
• C3 deficiency	• Glanzmanns thrombasthenia Type I
• Gangliosidosis 1	• Gangliosidosis GM2 Gangliosidosis
• Canine Multifocal Retinopathy cmr3	• Von Willebrand disease
• Canine multifocal retinopathy - Type 2	• Von Willebrand disease - Type II
• Canine multifocal retinopathy - Type 1	• Von Willebrand disease
• L-2-HGA-L-2-hydroxyglutaric aciduria	• May-Hegglin anomaly

• Musladin-Lueke Syndrome	• Myotubular Myopathy 1
• Axonal Disease Shaking Puppy Syndrome	• X-linked Severe Combined Immunodeficiency
• Canine leukocyte adhesion deficiency	• Pyruvate kinase deficiency
• Pyruvate Dehydrogenase Phosphatase Deficiency	• Intestinal malabsorption of cobalamin
• Imerslund-Grasbeck Syndrome	• Osteogenesis imperfecta
• Persistant Mullerian Duct Syndrome	• Cleft lip with or without cleft palate
• Gallbladder mucocele formation	• Protein Losing Nephropathy
	• Multi-Drug Sensitivity
• Malignant Hyperthermia	• Narcolepsy
• Sensory ataxic neuropathy	• Dry eye curly coat syndrome
• Hyperuricosuria	• Cystinuria
• Cystinuria1	• Cystinuria2
• Cystinuria4	• Cystinuria Type II-A

• Cystinuria Type II-B	• Spongiform leukoencephalomyelopathy
• Myostatin defect	• Centronuclear Myopathy
• Muscular dystrophy	• Spinocerebellar Ataxia
• Spondylocostal Dysostosis	• Familial Nephropathy
• Episodic falling syndrome	• Progressive Retinal Atrophy
• Progressive Retinal Atrophy - cord1	• Progressive Retinal Atrophy - cord2
• Progressive Retinal Atrophy - PRA1	• Progressive Retinal Atrophy - RCD1
• Progressive Retinal Atrophy - RCD3	• Progressive Retinal Atrophy - Type A
• Progressive Retinal Atrophy - PRCD	• Progressive Retinal Atrophy
• Progressive Retinal Atrophy - rcd4	• Progressive retinal atrophy - Dominant
• Cerebellar disease Cerebellar ataxia	• Collie eye anomaly
• Dilated Cardiomyopathy	• Phosphofructokinase deficiency
• Ligneous Membranitis	• Mucopolysaccharidosis Type IIIA
• Mucopolysaccharidosis Type VII	• MPS VI
• Factor VII deficiency	• Ectodermal dysplasia

• Prekallikrein Deficiency	• Globoid cell leukodystrophy
• Progressive neuronal abiotrophy	• Polyneuropathy
• Canine elliptocytosis	• Lysosomal Storage Disease
• Chondrodysplasia	• Neuronal Ceroid Lipofuscinosis
• Neuronal Ceroid Lipofuscinosis 1	• Neuronal Ceroid Lipofuscinosis 10
• Neuronal ceroid lipofuscinosis 12	• Neuronal Ceroid Lipofuscinosis 2
• Neuronal ceroid lipofuscinosis 5	• Neuronal Ceroid Lipofuscinosis 6
• Neuronal Ceroid Lipofuscinosis 8	• Neuroaxonal Dystrophy
• Renal Cystadenocarcinoma and Nodular Dermatofibrosis	• Axonal Disease Hypomyelination and Tremor
• Glycogen Storage Disease Type IIIa	• Glycogen Storage Disease Type II
• Glycogen Storage Disease Type Ia	• Degenerative myelopathy
• Late Onset Ataxia	
• Catalase Deficiency	• Pachyonychia congenita
• Cerebellar disease Cerebellar hypoplasia	• Cerebellar Ataxia
• Neonatal ataxia	• Neonatal Encephalopathy with Seizures

• Congenital Myotonia	• Congenital Myasthenic Syndrome
• Congenital hypothyroidism	• Primary Lens Luxation
• Congenital Stationary Night Blindness	• Congenital Macrothrombocytopenia
• Axonal Disease Fetal-onset neonatal	. neuroaxonal dystrophy
• Cerebellar abiotrophy	• Coagulopathy Thrombopathia
• Hemophilia A	• Hemophilia B
• Autosomal Recessive Amelogenesis Imperfecta	• Encephalopathy
• Alexander disease	• Severe Combined Immunodeficiency
• Fucosidosis	• Oculoskeletal Dysplasia 1
• Hereditary Vitamin D-Resistant Rickets	• Hereditary Cataracts
• Hereditary Cataracts	• Hereditary Nasal Parakeratosis
• Trapped Neutrophil Syndrome	• Hereditary Footpad Hyperkeratosis
• Dystrophic epidermolysis bullosa	• Juvenile Epilepsy
• Ichthyosis	• Primary hyperoxaluria type I
• Primary Open Angle Glaucoma	• Primary ciliary dyskinesia

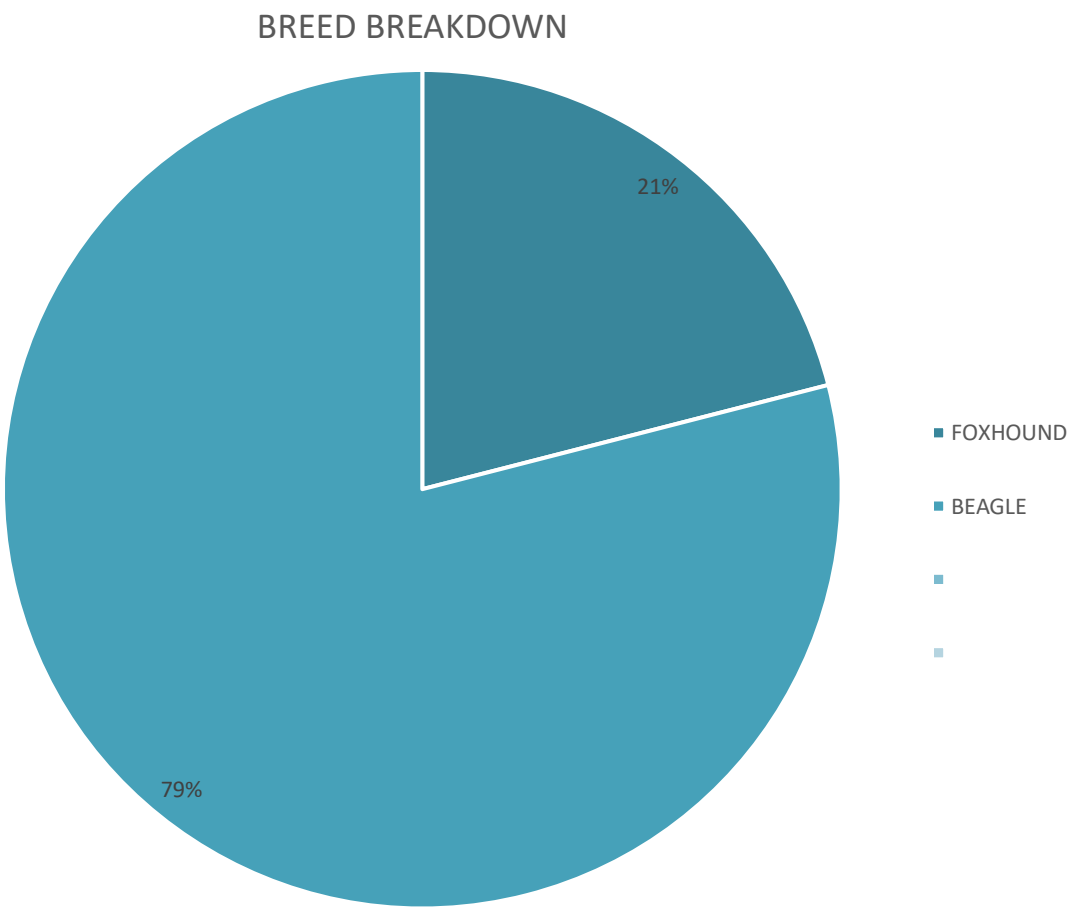
• Exercise Induced Collapse	• early retinal degeneration
Long QT Syndrome	• Cyclic neutropenia
• Day blindness	• Dwarfism

Complex Genetic Diseases:

• Canine hip dysplasia	• Hypothyroidism
• rupture of the cranial cruciate ligament	. obsessive-compulsive disorder
• ED	• Portosystemic Vascular Anomaly (PSVA)
• Mast cell tumor (MCT)	• Lymphoma
• Congenital Sensorineural Deafness	• osteosarcoma
• congenital megaesophagus	• hemangiosarcoma
• hemangiosarcoma	• Duchenne muscular dystrophy

2.1 Breed

Breed Identification Report 2.1



BEAGLE 79%

FOX HOUND 21%

BREED HISTORY: BREED CATOGARY: HUNTING DOGS

Foxhounds and beagles have been trusted throughout various hunting endeavours since as early as the 14th century, where they were used by even royalty to hunt hares and rabbits. Since then, these kinds of dogs have been bred and cross-bred to achieve only the best in hunting traits.

Though they have their differences, both Foxhounds and Beagles are incredibly intelligent. Since they are used in hunting, they must be very trainable. They have excellent senses and are very loyal to their masters. However, both breeds tend to have traits of stubbornness and impatience, and they are very independent. They are not likely to be shadows to their owners, but they also are not known to be Dominant.

SIMILARITIES

The most obvious similarity between the Foxhound and the Beagle is their appearance. Both dogs have short, straight hair that comes in similar colours and patterns. These patterns feature colours of white, black, tan, brown, and red shades, and they are very low maintenance in terms of grooming and dander.

Overall, both breeds tend to be very friendly. They behave well around families, kids, and other pets. Even though they are both known to be stubborn with a lack of patience and focus, they are affectionate and loving animals.

Foxhounds and Beagles both function best when they have a lot of space. Homes with large yards provide them enough space to run and roam. Another similarity, though not necessarily a positive one, is that they both tend to bark and howl. Both breeds are great with kids.

PREDICTED AVERAGE SIZE AND LIFE EXPECTANCY

HEIGHT

13 inches & under
13-15 inches

WEIGHT

under 20 pounds (13 inches & under)
20-30 pounds (13-15 inches)

LIFE EXPECTANCY

10-15 years

Common Genetic Diseases Associated to a Beagle are as follows:

- Factor VII deficiency
- Catalase Deficiency
- Intestinal malabsorption of cobalamin
- Musladin-Lueke Syndrome
- Cerebellar abiotrophy
- Osteogenesis imperfecta
- Primary Open Angle Glaucoma
- Pyruvate kinase deficiency
- Day blindness
- Congenital Stationary Night Blindness
- Malignant Hyperthermia
- Congenital hypothyroidism
- Degenerative myelopathy

Common Genetic Diseases Associated to a Foxhound are as follows:

- Progressive Retinal Atrophy
- Factor VII deficiency
- Catalase Deficiency

Single-Gene Disease Detection Report

Factor VII deficiency

Items	Factor VII deficiency
Test results	+/-
Genotype	GA
Genetic model	Recessive
Heredity	50.0% probability of passing at least one mutation to the next generation
Risk interpretation	Risk gene carrier

COMPLEX DISEASE DETECTION REPORT

Mast cell tumor

Items	***Mast cell tumor***
Test result	*High risk*
Relative risk	*96.29%*
Gene	*AP1M1 near; HYAL4 near*
Genotype	*G.G;G.G*

*The relative risk of Mast cell tumor in this sample is higher than 96.29% of dogs.

Osteosarcoma

Items	*Osteosarcoma*
Test result	*High risk*
Relative risk	*89.68%*
Gene	*FBL near;KIAA1462;None*
Genotype	*G.G;C.C;C.A*

*The relative risk of Osteosarcoma in this sample is higher than 89.68%of dogs.

Canine hip dysplasia

Items	Canine hip dysplasia
Test result	High risk
Relative risk	85.89%
Gene	CHST3;RPN1 near;CCND1 near;SRBD1;none
Genotype	C.C;T.T;T.T;C.C;A.G

*The relative risk of Canine hip dysplasia in this sample is higher than 85.89% of dogs.

Congenital megaesophagus

Items	Congenital megaesophagus
Test result	Medium risk
Relative risk	65.48%
Gene	FBXL14 near
Genotype	G.G

* The relative risk of Congenital megaesophagus in this sample is higher than 65.48% of dogs.

Obsessive-compulsive disorder

Items	Obsessive-compulsive disorder
Test result	Medium risk
Relative risk	57.02%
Gene	CPQ;DSC3
Genotype	C.C;G.A

* The relative risk of obsessive-compulsive disorder in this sample is higher than 57.02% of dogs.

Hemangiosarcoma

Items	Hemangiosarcoma
Test result	Medium risk
Relative risk	46.21%
Gene	ANGPTL5-TRPC6
Genotype	C.C

* The relative risk of Hemangiosarcoma in this sample is higher than 46.21% of dogs.

Lymphoma

Items	Lymphoma
Test result	Low risk
Relative risk	31.85%
Gene	MCC
Genotype	G.G

* The relative risk of Lymphoma in this sample is higher than 31.85% of dogs.

Congenital Sensorineural Deafness

Items	Congenital Sensorineural Deafness
Test result	Low risk
Relative risk	7.74%
Gene	HNF4G near; CRIM1; FRMD8; FUBP1
Genotype	T.T;A.A;C.C;G.A

* The relative risk of Congenital Sensorineural Deafness in this sample is higher than 7.74% of dogs.

Portosystemic Vascular Anomaly

Items	Portosystemic Vascular Anomaly
Test result	Low risk
Relative risk	4.27%
Gene	None
Genotype	A.G

*The relative risk of Portosystemic Vascular Anomaly in this sample is higher than 4.27% of dogs.

Hair Trait Report

The genes most likely to be carried by the next generation of this sample are yellow. white and red.

The hair type most likely to carry in the next generation of this sample is short straight hair.

Items	Trait
Coat color	Yellow/white/red
Hair type	Short straight hair

2.4 Behaviour

Behavior Characteristics	Test sample Result	Average of dogs
Concentration	3.61	3.62
Desire of gaming	2.72	2.77
Excitement	4.25	4.2
Obedience	3.09	3.31
IQ	5	1.38
Escaping	1.39	5
Courage	3.45	2.77
Irritability	3.68	3
Barking		3.09
Ability to be alone	4.07	3.02
Urination	3.69	2.23
Vitality	2.03	4.28

Explanation of Results

Clear

The test result „clear“ indicates that the tested dog does NOT carry a mutation for a specific genetic disease.

Carrier

The test result „carrier“ indicates that the tested dog carries ONE copy of the mutation for a specific genetic disease. However, the tested dog may not be clinically affected by this mutation because two copies of the mutation are usually required to cause disease.

Carrier / At Risk

The test result „carrier / at risk“ indicates that the tested dog carries ONE copy of the mutation that causes a specific genetic disease. Based on the mode of inheritance ONE mutant copy of the gene can cause symptoms. Dogs with only one copy may develop less severe symptoms as compared to dogs with two copies of this mutation.

At Risk

The test result „carrier / at risk “indicates that the tested dog carries ONE copy of the mutation that causes a specific genetic disease. Based on the mode of inheritance ONE mutant copy of the gene can cause symptoms. Dogs with only one copy may develop less severe symptoms as compared to dogs with two copies of this mutation.

No results

The test result „No result “indicates that no result for a specific disease/trait of your dog could be determined during analysis. This does not mean that your dog is a carrier or at risk for this disorder. There are several reasons why a particular analysis may fail. Unique variations in certain regions of the DNA may exist and cause a test to fail for what reason no result can be obtained. It is also possible that the sample material was not sufficient for a successful analysis. In addition, growth of bacteria or fungi can have a negative effect on sample quality and analysis. Results with at least 90% of successful analysis are considered as acceptable. In the case that your dog shows an unacceptable number of failed results, we will contact you for sending new sample material.