

# Nocco

Breed: Boerboel

Microchip number: 528210004882051

Birth date: 2018-05-25

Test date: 2022-03-14

ID kit: DYRJGWC



## Nocco's Profile

### Pet information

**Registered name**

Grootmoed Nabucco

**Sex**

M

**Owner reported breed**

Boerboel

**Date of birth**

2018-05-25

**Microchip number**

528210004882051

### Genetic Diversity

**Nocco's Percentage of Heterozygosity**

39%

### Health summary

At Risk 0 conditions

Carrier 0 conditions

Clear 211 conditions

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## Genetic Diversity

### Heterozygosity

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#### Nocco's Percentage of Heterozygosity

39%

Nocco's genome analysis shows an average level of genetic heterozygosity when compared with other Boerboels.

#### Typical Range for Boerboels

36% - 41%

## Health conditions known in the breed

Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Canine Multifocal Retinopathy 1</b>	BEST1	C>T	0	AR	<b>Clear</b>

### Information about the genetic condition

Typically, the first ocular fundus changes in CMR1 can be diagnosed by the age of four months. In many cases, the lesions may appear to heal or even go away, sometimes leaving no evidence or only a wrinkle at the site of the healed lesion. In almost all cases, lesions from CMR1 do not progress significantly over time, so there is generally no reduction in eyesight though more serious cases could exhibit vision impairment. Very seldom is the patient completely blinded.

### Breeder recommendation

This disease is autosomal recessive meaning that two copies of the mutation are needed for disease signs to develop. A carrier dog with one copy of the CMR1 mutation can be safely bred with a clear dog with no copies of the CMR1 mutation. About half of the puppies will have one copy (carriers) and half will have no copies of the CMR1 mutation. A dog with two copies of the CMR1 mutation can be safely bred with a clear dog. The resulting puppies will be all carriers with one copy of the CMR1 mutation. Puppies in a litter which is expected to contain carriers should be tested prior to breeding. Please note: It is possible that disease signs similar to the ones caused by the CMR1 mutation could develop due to a different genetic or clinical cause.

Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Hyperuricosuria</b>	SLC2A9	G>T	0	AR	<b>Clear</b>

### Information about the genetic condition

HUU predisposes affected dogs to the formation of urate stones. Clinical signs of urolithiasis include hematuria, pain while urinating, and blockage of the urinary tract. Patients with urinary stones are more susceptible to urinary tract infections. Blockage of the urinary tract is a life-threatening condition that requires immediate veterinary care. In Dalmatians, the clinical signs are more common in males than in females. As many as 34% of all male Dalmatians are diagnosed with urate stones.

### Breeder recommendation

This disease is autosomal recessive meaning that two copies of the mutation are needed for disease signs to occur. A carrier dog with one copy of the HUU mutation can be safely bred with a clear dog with no copies of the HUU mutation. About half of the puppies will have one copy (carriers) and half will have no copies of the HUU mutation. A dog with two copies of the HUU mutation can be safely bred with a clear dog. The resulting puppies will all be carriers. Puppies in a litter which is expected to contain carriers should be tested prior to breeding. In some breeds, such as the Dalmatian, the frequency of the disease mutation is very high. Carriers and dogs with two copies of the disease mutation (genetically affected dogs) should be used for breeding purposes, with the aim of gradually reducing the frequency of the mutant gene within the breed population. Where possible, matings should be avoided that would result in litters that could contain dogs with two copies of the disease mutation, such as a mating between two dogs with two copies of the HUU mutation or between a dog with one copy and a dog with two copies of the HUU mutation. Please note: It is possible that disease signs similar to the ones caused by the HUU mutation could develop due to a different genetic or clinical cause.

## Traits

### Coat Color

	Gene	Variant	Copies	Result
<b>Fawn</b> Copies of this variant will cause dogs to show fawn if they do not have other variant that will mask this effect, such as a plain red, black or white coat.	ASIP	a <sup>v</sup>	2	Fawn possible
<b>Recessive Black</b>	ASIP	a	0	No effect
<b>Tan Points</b>	ASIP	a <sup>t</sup>	0	No effect
<b>Dominant Black</b> One or two copies of the dominant black will give a dog a black coat (depending on other variants), black eye rims, nose and pads. One copy may also give a tiger striped appearance, known as brindle patterning.	CBD103	K <sup>B</sup>	1	Black or brindle possible
<b>Mask</b> One or two copies of the Mask mutation will result in the presence of a dark facial mask covering the muzzle. This mask can cover only the very front of the muzzle, or can extend down to the chest and front legs. Mask can be hidden by other trait variants.	MC1R	E <sup>m</sup>	2	Dark Muzzle possible
<b>Recessive Red (e1)</b>	MC1R	e <sup>1</sup>	0	No effect
<b>Recessive Red (e2)</b>	MC1R	e <sup>2</sup>	0	No effect
<b>Recessive Red (e3)</b>	MC1R	e <sup>3</sup>	0	No effect
<b>Widow's Peak (Discovered in Ancient dogs)</b>	MC1R	e <sup>A</sup>	0	No effect
<b>Widow's Peak (Discovered in the Afghan Hound and Saluki)</b>	MC1R	e <sup>G</sup>	0	No effect

### Color Modification

	Gene	Variant	Copies	Result
<b>Red Intensity</b>	MFSD12	i	—	Inconclusive
<b>Dilution (d1) Linkage test</b>	MLPH	d <sup>1</sup>	0	No effect
<b>Dilution (d2)</b>	MLPH	d <sup>2</sup>	0	No effect

## Color Modification

	Gene	Variant	Copies	Result
<b>Dilution (d3)</b>	MLPH	d <sup>3</sup>	0	No effect
<b>Chocolate (basd)</b>	TYRP1	b <sup>asd</sup>	0	No effect
<b>Chocolate (bc)</b>	TYRP1	b <sup>c</sup>	0	No effect
<b>Chocolate (bd)</b>	TYRP1	b <sup>d</sup>	0	No effect
<b>Chocolate (bs)</b>	TYRP1	b <sup>s</sup>	0	No effect

## Coat Patterns

	Gene	Variant	Copies	Result
<b>Piebald</b> Dog with copies of the Piebald variant are likely to show white spotting, patches and/or a white coat, with two copies having a greater effect than one, although the strength of this effect may be influenced by other genes.	MITF	sp	1	White markings possible
<b>Merle</b>	PMEL	M	0	No effect
<b>Harlequin</b>	PSMB7	H	0	No effect
<b>Saddle Tan</b> One or two copies of the Saddle Tan variant are needed for the "saddle" to be seen. However the Tan Points variant must also be present. The Saddle Tan variant is actually considered to be the wild type, or default, variant.	RALY	-	1	Saddle possible

## Coat Length and Curl

	Gene	Variant	Copies	Result
<b>Long Hair (lh1)</b>	FGF5	lh <sup>1</sup>	0	No effect
<b>Long Hair (lh2)</b>	FGF5	lh <sup>2</sup>	0	No effect
<b>Long Hair (lh3)</b>	FGF5	lh <sup>3</sup>	0	No effect
<b>Long Hair (lh4)</b>	FGF5	lh <sup>4</sup>	0	No effect

## Coat Length and Curl

	Gene	Variant	Copies	Result
<b>Long Hair (lh5)</b>	FGF5	lh <sup>5</sup>	0	No effect
<b>Curly Coat</b>	KRT71	C	1	Soft curl or wave likely

One copy of this variant is likely to give a soft curl or wave whereas two copies are likely to give a tighter curl. A curly coat is less apparent in dogs with short hair than those with long. There is one other known Curl variant, and likely other unknown variants that exist.

## Hairlessness

	Gene	Variant	Copies	Result
<b>Hairlessness (Discovered in the Chinese Crested Dog)</b> Linkage test	FOXI3	Hr <sup>cc</sup>	0	No effect
<b>Hairlessness (Discovered in the American Hairless Terrier)</b>	SGK3	hr <sup>ah</sup> t	0	No effect
<b>Hairlessness (Discovered in the Scottish Deerhound)</b>	SKG3	hr <sup>sd</sup>	0	No effect

## Shedding

	Gene	Variant	Copies	Result
<b>Reduced Shedding</b>	MC5R	sd	2	Low shedder

One or two copies of the Reduced Shedding variant is likely to reduce a dog's tendency to shed. Copies of the Furnishings variant, particularly two, also reduce the tendency of a dog to shed.

## More Coat Traits

	Gene	Variant	Copies	Result
<b>Hair Ridge</b>	FGF3, FGF4, FGF19, ORAOV1	R	0	No effect
<b>Furnishings</b>	RSPO2	F	0	No effect

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## More Coat Traits

	Gene	Variant	Copies	Result
<b>Albino</b>	SLC45A2	ca1	0	No effect

## Head Shape

	Gene	Variant	Copies	Result
<b>Short Snout (BMP3 variant)</b>	BMP3	-	0	No effect
<b>Short Snout (SMOC2 variant)</b>	SMOC2	-	0	No effect

## Eye Color

	Gene	Variant	Copies	Result
<b>Blue Eyes (Discovered in the Siberian Husky)</b>	ALX4	-	0	No effect

## Ears

	Gene	Variant	Copies	Result
<p><b>Floppy Ears</b></p> <p>Dogs with zero copies of this variant are more likely to have permanently upright or prick ears, and fully folded ears are more likely with two copies inherited. Please note however that many genetic variants influence ear carriage. Dogs with some cartilage stiffness to their ears can sometimes raise their ears upright when 'at alert' but will flop down when relaxed.</p>	MSRB3	-	1	Partially floppy ears more likely

## Extra Toes

	Gene	Variant	Copies	Result
<b>Hind Dewclaws (Discovered in Asian breeds)</b>	LMBR1	DC-1	0	No effect
<b>Hind Dewclaws (Discovered in Western breeds)</b>	LMBR1	DC-2	0	No effect

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## More Body Features

	Gene	Variant	Copies	Result
<b>Back Muscle and Bulk</b> One or two copies of the Back Muscle and Bulk variant may result in a bulkier more muscled back.	ACSL4	-	2	Bulky appearance likely
<b>High Altitude Adaptation</b>	EPAS1	-	0	No effect
<b>Short Legs (Chondrodysplasia, CDPA)</b>	FGF4	-	0	No effect
<b>Short Tail</b>	T-box	T	0	Full tail length likely

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Cerebral Dysfunction</b>	SLC6A3	G>A	—	AR	Inconclusive
<b>Progressive Rod Cone Degeneration (prcd-PRA)</b>	PRCD	G>A	—	AR	Inconclusive
<b>Pyruvate Kinase Deficiency (Discovered in the Beagle)</b>	PKLR	G>A	—	AR	Inconclusive
<b>2,8-dihydroxyadenine (DHA) Urolithiasis</b>	APRT	G>A	0	AR	Clear
<b>Acral Mutilation Syndrome</b>	GDNF	C>T	0	AR	Clear
<b>Acute Respiratory Distress Syndrome</b>	ANLN	C>T	0	AR	Clear
<b>Alaskan Husky Encephalopathy</b>	SLC19A3	G>A	0	AR	Clear
<b>Alexander Disease</b>	GFAP	G>A	0	AR	Clear
<b>Amelogenesis Imperfecta (Discovered in the Italian Greyhound)</b>	ENAM	Deletion	0	AR	Clear
<b>Amelogenesis Imperfecta (Discovered in the Parson Russell Terrier)</b>	ENAM	C>T	0	AR	Clear
<b>Bandera's Neonatal Ataxia</b>	GRM1	Insertion	0	AR	Clear
<b>Benign Familial Juvenile Epilepsy</b>	LGI2	A>T	0	AR	Clear
<b>Canine Leukocyte Adhesion Deficiency (CLAD), type III</b>	FERMT3	Insertion	0	AR	Clear
<b>Canine Multifocal Retinopathy 2</b>	BEST1	G>A	0	AR	Clear
<b>Canine Multifocal Retinopathy 3</b>	BEST1	Deletion	0	AR	Clear
<b>Canine Scott Syndrome</b>	ANO6	G>A	0	AR	Clear
<b>Centronuclear Myopathy (Discovered in the Great Dane)</b>	BIN1	A>G	0	AR	Clear
<b>Centronuclear Myopathy (Discovered in the Labrador Retriever)</b>	PTPLA	Insertion	0	AR	Clear
<b>Cerebellar Ataxia</b>	RAB24	A>C	0	AR	Clear
<b>Cerebellar Cortical Degeneration</b>	SNX14	C>T	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Cerebellar Hypoplasia</b>	VLDLR	Deletion	0	AR	Clear
<b>Chondrodysplasia (Discovered in Norwegian Elkhound and Karelian Bear Dog)</b>	ITGA10	C>T	0	AR	Clear
<b>Cleft Lip &amp; Palate with Syndactyly</b>	ADAMTS20	Deletion	0	AR	Clear
<b>Cleft Palate</b>	DLX6	C>A	0	AR	Clear
<b>Collie Eye Anomaly (CEA)</b>	NHEJ1	Deletion	0	AR	Clear
<b>Complement 3 Deficiency</b>	C3	Deletion	0	AR	Clear
<b>Cone Degeneration (Discovered in the Alaskan Malamute)</b>	CNGB3	Deletion	0	AR	Clear
<b>Cone Degeneration (Discovered in the German Shepherd Dog)</b>	CNGA3	C>T	0	AR	Clear
<b>Cone Degeneration (Discovered in the German Shorthaired Pointer)</b>	CNGB3	G>A	0	AR	Clear
<b>Cone-Rod Dystrophy</b>	NPHP4	Deletion	0	AR	Clear
<b>Cone-Rod Dystrophy 1</b>	PDE6B	Deletion	0	AR	Clear
<b>Cone-Rod Dystrophy 2</b>	IQCB1	Insertion	0	AR	Clear
<b>Congenital Dyshormonogenic Hypothyroidism with Goiter (Discovered in the Shih Tzu)</b>	SLC5A5	G>A	0	AR	Clear
<b>Congenital Hypothyroidism (Discovered in the Tenterfield Terrier)</b>	TPO	C>T	0	AR	Clear
<b>Congenital Hypothyroidism (Discovered in the Toy Fox and Rat Terrier)</b>	TPO	C>T	0	AR	Clear
<b>Congenital Myasthenic Syndrome (Discovered in the Golden Retriever)</b>	COLQ	G>A	0	AR	Clear
<b>Congenital Myasthenic Syndrome (Discovered in the Jack Russell Terrier)</b>	CHRNE	Insertion	0	AR	Clear
<b>Congenital Myasthenic Syndrome (Discovered in the Labrador Retriever)</b>	COLQ	T>C	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Congenital Myasthenic Syndrome (Discovered in the Old Danish Pointer)</b>	CHAT	G>A	0	AR	Clear
<b>Congenital Stationary Night Blindness (CSNB)</b>	RPE65	A>T	0	AR	Clear
<b>Craniomandibular Osteopathy (Discovered in Scottish Terrier breeds)</b>	SLC37A2	C>T	0	AD	Clear
<b>Cystic Renal Dysplasia and Hepatic Fibrosis</b>	INPP5E	G>A	0	AR	Clear
<b>Cystinuria Type I-A</b>	SLC3A1	C>T	0	AR	Clear
<b>Cystinuria Type II-A</b>	SLC3A1	Deletion	0	AD	Clear
<b>Deafness and Vestibular Dysfunction (DINGS1), (Discovered in Doberman Pinscher)</b>	PTPRQ	Insertion	0	AR	Clear
<b>Degenerative Myelopathy</b>	SOD1	G>A	0	AR	Clear
<b>Demyelinating Neuropathy</b>	SBF2	G>T	0	AR	Clear
<b>Dental Hypomineralization</b>	FAM20C	C>T	0	AR	Clear
<b>Dilated Cardiomyopathy (Discovered in the Schnauzer)</b>	RBM20	Deletion	0	AR	Clear
<b>Dominant Progressive Retinal Atrophy</b>	RHO	C>G	0	AD	Clear
<b>Dystrophic Epidermolysis Bullosa (Discovered in the Central Asian Ovcharka)</b>	COL7A1	C>T	0	AR	Clear
<b>Dystrophic Epidermolysis Bullosa (Discovered in the Golden Retriever)</b>	COL7A1	C>T	0	AR	Clear
<b>Early Adult Onset Deafness For Border Collies only (Linkage test)</b>	Intergenic	Insertion	0	AR	Clear
<b>Early Retinal Degeneration (Discovered in the Norwegian Elkhound)</b>	STK38L	Insertion	0	AR	Clear
<b>Early-Onset Progressive Polyneuropathy (Discovered in the Alaskan Malamute)</b>	NDRG1	G>T	0	AR	Clear
<b>Early-Onset Progressive Polyneuropathy (Discovered in the Greyhound)</b>	NDRG1	Deletion	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Early-Onset Progressive Retinal Atrophy (Discovered in the Portuguese Water Dog)</b>	CCDC66	Insertion	0	AR	Clear
<b>Epidermolytic Hyperkeratosis</b>	KRT10	G>T	0	AR	Clear
<b>Episodic Falling Syndrome</b>	BCAN	Insertion	0	AR	Clear
<b>Exercise-Induced Collapse</b>	DNM1	G>T	0	AR	Clear
<b>Factor VII Deficiency</b>	F7	G>A	0	AR	Clear
<b>Factor XI Deficiency</b>	FXI	Insertion	0	AD	Clear
<b>Fanconi Syndrome</b>	FAN1	Deletion	0	AR	Clear
<b>Fetal Onset Neuroaxonal Dystrophy</b>	MFN2	G>C	0	AR	Clear
<b>Focal Non-Epidermolytic Palmoplantar Keratoderma</b>	KRT16	G>C	0	AR	Clear
<b>Generalized Progressive Retinal Atrophy (Discovered in the Schapendoes)</b>	CCDC66	Insertion	0	AR	Clear
<b>Glanzmann Thrombasthenia Type I (Discovered in Great Pyrenees)</b>	ITGA2B	C>G	0	AR	Clear
<b>Glanzmann Thrombasthenia Type I (Discovered in mixed breed dogs)</b>	ITGA2B	C>T	0	AR	Clear
<b>Globoid Cell Leukodystrophy (Discovered in Terriers)</b>	GALC	A>C	0	AR	Clear
<b>Globoid Cell Leukodystrophy (Discovered in the Irish Setter)</b>	GALC	A>T	0	AR	Clear
<b>Glycogen Storage Disease Type Ia (Discovered in the Maltese)</b>	G6PC	G>C	0	AR	Clear
<b>Glycogen Storage Disease Type IIIa, (GSD IIIa)</b>	AGL	Deletion	0	AR	Clear
<b>GM1 Gangliosidosis (Discovered in the Portuguese Water Dog)</b>	GLB1	G>A	0	AR	Clear
<b>GM1 Gangliosidosis (Discovered in the Shiba)</b>	GLB1	Deletion	0	AR	Clear
<b>GM2 Gangliosidosis (Discovered in the Japanese Chin)</b>	HEXA	G>A	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>GM2 Gangliosidosis (Discovered in the Toy Poodle)</b>	HEXB	Deletion	0	AR	Clear
<b>Goniodysgenesis and Glaucoma (Discovered in the Border Collie)</b>	OLFML3	G>A	0	AR	Clear
<b>Hemophilia A (Discovered in Old English Sheepdog)</b>	FVIII	C>T	0	XR	Clear
<b>Hemophilia A (Discovered in the Boxer)</b>	FVIII	C>G	0	XR	Clear
<b>Hemophilia A (Discovered in the German Shepherd Dog - Variant 1)</b>	FVIII	G>A	0	XR	Clear
<b>Hemophilia A (Discovered in the German Shepherd Dog - Variant 2)</b>	FVIII	G>A	0	XR	Clear
<b>Hemophilia A (Discovered in the Havanese)</b>	FVIII	Insertion	0	XR	Clear
<b>Hemophilia B</b>	FIX	G>A	0	XR	Clear
<b>Hemophilia B (Discovered in the Airedale Terrier)</b>	FIX	Insertion	0	XR	Clear
<b>Hemophilia B (Discovered in the Lhasa Apso)</b>	FIX	Deletion	0	XR	Clear
<b>Hereditary Ataxia (Discovered in the Norwegian Buhund)</b>	KCNIP4	T>C	0	AR	Clear
<b>Hereditary Elliptocytosis</b>	SPTB	C>T	0	AD	Clear
<b>Hereditary Footpad Hyperkeratosis</b>	FAM83G	G>C	0	AR	Clear
<b>Hereditary Nasal Parakeratosis (Discovered in the Greyhound)</b>	SUV39H2	Deletion	0	AR	Clear
<b>Hereditary Nasal Parakeratosis (Discovered in the Labrador Retriever)</b>	SUV39H2	A>C	0	AR	Clear
<b>Hereditary Vitamin D-Resistant Rickets Type II</b>	VDR	Deletion	0	AR	Clear
<b>Hypocatalasia</b>	CAT	G>A	0	AR	Clear
<b>Hypomyelination</b>	FNIP2	Deletion	0	AR	Clear
<b>Hypophosphatasia</b>	Confidential	-	0	AR	Clear
<b>Ichthyosis (Discovered in the American Bulldog)</b>	NIPAL4	Deletion	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Ichthyosis (Discovered in the Great Dane)</b>	SLC27A4	G>A	0	AR	Clear
<b>Intestinal Cobalamin Malabsorption (Discovered in the Beagle)</b>	CUBN	Deletion	0	AR	Clear
<b>Intestinal Cobalamin Malabsorption (Discovered in the Border Collie)</b>	CUBN	Deletion	0	AR	Clear
<b>Intestinal Cobalamin Malabsorption (Discovered in the Komondor)</b>	CUBN	G>A	0	AR	Clear
<b>Juvenile Encephalopathy (Discovered in the Parson Russell Terrier)</b>	Confidential	-	0	AR	Clear
<b>Juvenile Laryngeal Paralysis and Polyneuropathy</b>	RAB3GAP1	Deletion	0	AR	Clear
<b>Juvenile Myoclonic Epilepsy</b>	DIRAS1	Deletion	0	AR	Clear
<b>L-2-Hydroxyglutaric aciduria (Discovered in the Staffordshire Bull Terrier)</b>	L2HGDH	T>C	0	AR	Clear
<b>L-2-Hydroxyglutaric Aciduria (Discovered in the West Highland White Terrier)</b>	Confidential	-	0	AR	Clear
<b>Lagotto Storage Disease</b>	ATG4D	G>A	0	AR	Clear
<b>Lamellar Ichthyosis</b>	TGM1	Insertion	0	AR	Clear
<b>Lethal Acrodermatitis (Discovered in the Bull Terrier)</b>	MKLN1	A>C	0	AR	Clear
<b>Ligneous Membranitis</b>	PLG	T>A	0	AR	Clear
<b>Lung Developmental Disease (Discovered in the Airedale Terrier)</b>	LAMP3	C>T	0	AR	Clear
<b>Macrothrombocytopenia (Discovered in Norfolk and Cairn Terrier)</b>	TUBB1	G>A	0	AR	Clear
<b>May-Hegglin Anomaly</b>	MYH9	G>A	0	AD	Clear
<b>MDR1 Medication Sensitivity</b>	MDR1/ABCB1	Deletion	0	AD	Clear
<b>Microphthalmia (Discovered in the Soft-Coated Wheaten Terrier)</b>	RBP4	Deletion	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Mucopolysaccharidosis Type IIIA (Discovered in the Dachshund)</b>	SGSH	C>A	0	AR	Clear
<b>Mucopolysaccharidosis Type IIIA (Discovered in the New Zealand Huntaway)</b>	SGSH	Insertion	0	AR	Clear
<b>Mucopolysaccharidosis Type VII (Discovered in the Brazilian Terrier)</b>	GUSB	C>T	0	AR	Clear
<b>Mucopolysaccharidosis Type VII (Discovered in the German Shepherd Dog)</b>	GUSB	G>A	0	AR	Clear
<b>Muscular Dystrophy (Discovered in the Cavalier King Charles Spaniel)</b>	Dystrophin	G>T	0	XR	Clear
<b>Muscular Dystrophy (Discovered in the Golden Retriever)</b>	Dystrophin	A>G	0	XR	Clear
<b>Muscular Dystrophy (Discovered in the Landseer)</b>	COL6A1	G>T	0	AR	Clear
<b>Muscular Dystrophy (Discovered in the Norfolk Terrier)</b>	Dystrophin	Deletion	0	XR	Clear
<b>Muscular Hypertrophy (Double Muscling)</b>	MSTN	T>A	0	AR	Clear
<b>Musladin-Lueke Syndrome</b>	ADAMTSL2	C>T	0	AR	Clear
<b>Myeloperoxidase Deficiency</b>	MOP	C>T	0	AR	Clear
<b>Myotonia Congenita (Discovered in Australian Cattle Dog)</b>	CLCN1	Insertion	0	AR	Clear
<b>Myotonia Congenita (Discovered in the Labrador Retriever)</b>	CLCN1	T>A	0	AR	Clear
<b>Myotonia Congenita (Discovered in the Miniature Schnauzer)</b>	CLCN1	C>T	0	AR	Clear
<b>Myotubular Myopathy</b>	MTM1	A>C	0	XR	Clear
<b>Narcolepsy (Discovered in the Dachshund)</b>	HCRTR2	G>A	0	AR	Clear
<b>Narcolepsy (Discovered in the Labrador Retriever)</b>	HCRTR2	G>A	0	AR	Clear
<b>Nemaline Myopathy</b>	NEB	C>A	0	AR	Clear
<b>Neonatal Cerebellar Cortical Degeneration</b>	SPTBN2	Deletion	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
Neonatal Encephalopathy with Seizures	ATF2	T>G	0	AR	Clear
Neuroaxonal Dystrophy (Discovered in Spanish Water Dog)	TECPR2	C>T	0	AR	Clear
Neuroaxonal Dystrophy (Discovered in the Papillon)	PLA2G6	G>A	0	AR	Clear
Neuroaxonal Dystrophy (Discovered in the Rottweiler)	VPS11	A>G	0	AR	Clear
Neuronal Ceroid Lipofuscinosis 1	PPT1	Insertion	0	AR	Clear
Neuronal Ceroid Lipofuscinosis 12 (Discovered in the Australian Cattle Dog)	ATP13A2	C>T	0	AR	Clear
Neuronal Ceroid Lipofuscinosis 7	MFSD8	Deletion	0	AR	Clear
Neuronal Ceroid Lipofuscinosis 8 (Discovered in the Alpine Dachsbracke)	CLN8	Deletion	0	AR	Clear
Neuronal Ceroid Lipofuscinosis 8 (Discovered in the Australian Shepherd)	CLN8	G>A	0	AR	Clear
Neuronal Ceroid Lipofuscinosis 8 (Discovered in the English Setter)	CLN8	T>C	0	AR	Clear
Neuronal Ceroid Lipofuscinosis 8 (Discovered in the Saluki)	CLN8	Insertion	0	AR	Clear
Obesity risk (POMC)	POMC	Deletion	0	AD	Clear
Osteochondrodysplasia	SLC13A1	Deletion	0	AR	Clear
Osteochondromatosis (Discovered in the American Staffordshire Terrier)	EXT2	C>A	0	AR	Clear
Osteogenesis Imperfecta (Discovered in the Beagle)	COL1A2	C>T	0	AD	Clear
Osteogenesis Imperfecta (Discovered in the Dachshund)	SERPINH1	T>C	0	AR	Clear
P2RY12-associated Bleeding Disorder	P2RY12	Deletion	0	AR	Clear
Paroxysmal Dyskinesia	PIGN	C>T	0	AR	Clear
Persistent Müllerian Duct Syndrome	AMHR2	C>T	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Phosphofructokinase Deficiency</b>	PFKM	G>A	0	AR	Clear
<b>Polycystic Kidney Disease</b>	PKD1	G>A	0	AD	Clear
<b>Prekallikrein Deficiency</b>	KLKB1	T>A	0	AR	Clear
<b>Primary Ciliary Dyskinesia</b>	CCDC39	C>T	0	AR	Clear
<b>Primary Ciliary Dyskinesia (Discovered in the Alaskan Malamute)</b>	NME5	Deletion	0	AR	Clear
<b>Primary Lens Luxation</b>	ADAMTS17	G>A	0	AR	Clear
<b>Primary Open Angle Glaucoma (Discovered in Basset Fauve de Bretagne)</b>	ADAMTS17	G>A	0	AR	Clear
<b>Primary Open Angle Glaucoma (Discovered in Petit Basset Griffon Vendeen)</b>	ADAMTS17	Insertion	0	AR	Clear
<b>Primary Open Angle Glaucoma and Lens Luxation (Discovered in Chinese Shar-Pei)</b>	ADAMTS17	Deletion	0	AR	Clear
<b>Progressive Early-Onset Cerebellar Ataxia</b>	SEL1L	T>C	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Basenji)</b>	SAG	T>C	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Golden Retriever - GR-PRA1 variant)</b>	SLC4A3	Insertion	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Lhasa Apso)</b>	IMPG2	Insertion	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Papillon and Phalène)</b>	CNGB1	Deletion	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Shetland Sheepdog - BBS2 variant)</b>	Confidential	-	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Shetland Sheepdog - CNGA1 variant)</b>	CNGA1	Deletion	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Swedish Vallhund)</b>	MERTK	Insertion	0	AR	Clear
<b>Progressive Retinal Atrophy 1 (Discovered in the Italian Greyhound)</b>	Confidential	-	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Progressive Retinal Atrophy Type III</b>	FAM161A	Insertion	0	AR	Clear
<b>Protein Losing Nephropathy</b>	NPHS1	G>A	0	AR	Clear
<b>Pyruvate Dehydrogenase Phosphatase 1 Deficiency</b>	PDP1	C>T	0	AR	Clear
<b>Pyruvate Kinase Deficiency (Discovered in the Basenji)</b>	PKLR	Deletion	0	AR	Clear
<b>Pyruvate Kinase Deficiency (Discovered in the Pug)</b>	PKLR	T>C	0	AR	Clear
<b>Pyruvate Kinase Deficiency (Discovered in the West Highland White Terrier)</b>	PKLR	Insertion	0	AR	Clear
<b>QT Syndrome</b>	KCNQ1	C>A	0	AD	Clear
<b>Renal Cystadenocarcinoma and Nodular Dermatofibrosis</b>	FLCN	A>G	0	AD	Clear
<b>Rod-Cone Dysplasia 1</b>	PDE6B	G>A	0	AR	Clear
<b>Rod-Cone Dysplasia 1a</b>	PDE6B	Insertion	0	AR	Clear
<b>Rod-Cone Dysplasia 3</b>	PDE6A	Deletion	0	AR	Clear
<b>Sensory Ataxic Neuropathy</b>	tRNATyr	Deletion	0	MT	Clear
<b>Sensory Neuropathy</b>	FAM134B	Insertion	0	AR	Clear
<b>Severe Combined Immunodeficiency (Discovered in Frisian Water Dogs)</b>	RAG1	G>T	0	AR	Clear
<b>Severe Combined Immunodeficiency (Discovered in Russell Terriers)</b>	PRKDC	G>T	0	AR	Clear
<b>Shaking Puppy Syndrome (Discovered in the Border Terrier)</b>	Confidential	-	0	AR	Clear
<b>Skeletal Dysplasia 2</b>	COL11A2	G>C	0	AR	Clear
<b>Spinocerebellar Ataxia (Late-Onset Ataxia)</b>	CAPN1	G>A	0	AR	Clear
<b>Spinocerebellar Ataxia with Myokymia and/or Seizures</b>	KCNJ10	C>G	0	AR	Clear
<b>Spondylocostal Dysostosis</b>	HES7	Deletion	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Spongy Degeneration with Cerebellar Ataxia (Discovered in Belgian Malinois - SDCA1)</b>	KCNJ10	T>C	0	AR	Clear
<b>Spongy Degeneration with Cerebellar Ataxia (Discovered in Belgian Malinois - SDCA2)</b>	ATP1B2	Insertion	0	AR	Clear
<b>Stargardt Disease (Discovered in the Labrador Retriever)</b>	ABCA4	Insertion	0	AR	Clear
<b>Startle Disease (Discovered in Irish Wolfhounds)</b>	SLC6A5	G>T	0	AR	Clear
<b>Trapped Neutrophil Syndrome</b>	VPS13B	Deletion	0	AR	Clear
<b>Van den Ende-Gupta Syndrome</b>	SCARF2	Deletion	0	AR	Clear
<b>von Willebrand's Disease, type 1</b>	VWF	G>A	0	AD	Clear
<b>von Willebrand's Disease, type 2</b>	VWF	T>G	0	AR	Clear
<b>von Willebrand's Disease, type 3 (Discovered in the Kooiker Hound)</b>	VWF	G>A	0	AR	Clear
<b>von Willebrand's Disease, type 3 (Discovered in the Scottish Terrier)</b>	VWF	Deletion	0	AR	Clear
<b>von Willebrand's Disease, type 3 (Discovered in the Shetland Sheepdog)</b>	VWF	Deletion	0	AR	Clear
<b>X-Linked Ectodermal Dysplasia</b>	EDA	G>A	0	XR	Clear
<b>X-Linked Hereditary Nephropathy (Discovered in the Navasota Dog)</b>	COL4A5	Deletion	0	XR	Clear
<b>X-Linked Hereditary Nephropathy (Discovered in the Samoyed)</b>	COL4A5	G>T	0	XR	Clear
<b>X-Linked Myotubular Myopathy</b>	MTM1	C>A	0	XR	Clear
<b>X-Linked Progressive Retinal Atrophy 1</b>	RPGR	Deletion	0	XR	Clear
<b>X-Linked Progressive Retinal Atrophy 2</b>	RPGR	Deletion	0	XR	Clear
<b>X-Linked Severe Combined Immunodeficiency (Discovered in the Basset Hound)</b>	IL2RG	Deletion	0	XR	Clear
<b>X-Linked Severe Combined Immunodeficiency (Discovered in the Cardigan Welsh Corgi)</b>	IL2RG	Insertion	0	XR	Clear

# Nocco

Breed: Boerboel

Microchip number: 528210004882051

Birth date: 2018-05-25

Test date: 2022-03-14

ID kit: DYRJGWC



## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>X-Linked Tremors</b>	PLP1	A>C	0	XR	Clear
<b>Xanthinuria (Discovered in a mixed breed dog)</b>	Confidential	-	0	AR	Clear
<b>Xanthinuria (Discovered in the Cavalier King Charles Spaniel)</b>	Confidential	-	0	AR	Clear
<b>Xanthinuria (Discovered in the Toy Manchester Terrier)</b>	Confidential	-	0	AR	Clear

## Glossary of genetic terms

### Test result definitions

**At Risk:** Based on the disorder's mode of inheritance, the dog inherited a number of genetic variant(s) which increases the dog's risk of being diagnosed with the associated disorder.

**Carrier:** The dog inherited one copy of a genetic variant when two copies are usually necessary to increase the dog's risk of being diagnosed with the associated disorder. While carriers are usually not at risk of clinical expression of the disorder, carriers of some complex variants may be associated with a low risk of developing the disorder.

**Clear:** The dog did not inherit the genetic variant(s) associated with the disorder and will not be at elevated risk of being diagnosed with the disorder due to this genotype. However, similar clinical signs could develop from different genetic or clinical causes.

**Inconclusive:** An inconclusive result indicates a confident call could not be made based on the data for that genetic variant. Health testing is performed in replicates, and on occasion the outcomes do not agree. This may occur due to an unusual sequence of DNA in the region tested, multiple cell genotypes present due to chimerism or acquired mutations, or due to quality of the DNA sample.

### Inheritance mode definitions

**Autosomal Recessive (AR):** For autosomal recessive disorders, dogs with two copies of the genetic variant are at risk of developing the associated disorder. Dogs with one copy of the variant are considered carriers and are usually not at risk of developing the disorder. However, carriers of some complex variants grouped in this category may be associated with a low risk of developing the disorder. Dogs with one or two copies may pass the disorder-associated variant to their puppies if bred.

**Autosomal Dominant (AD):** For autosomal dominant disorders, dogs with one or two copies of the genetic variant are at risk of developing the associated disorder. Inheriting two copies of the variant may increase the risk of development of the disorder or cause the condition to be more severe. These dogs may pass the disorder-associated variant to their puppies if bred.

**X-linked Recessive (XR):** For X-linked recessive disorders, the genetic variant is found on the X chromosome. Female dogs must inherit two copies of the variant to be at risk of developing the condition, whereas male dogs only need one copy to be at risk. Males and females with any copies of the variant may pass the disorder-associated variant to their puppies if bred.

**X-linked Dominant (XD):** For X-linked dominant disorders, the genetic variant is found on the X chromosome. Both male and female dogs with one copy of the variant are at risk of developing the disorder. Females inheriting two copies of the variant may be at higher risk or show a more severe form of the disorder than with one copy. Males and females with any copies of the variant may pass the disorder-associated variant to their puppies if bred.

**Mitochondrial (MT):** Unlike the two copies of genomic DNA held in the nucleus, there are thousands of mitochondria in each cell of the body, and each holds its own mitochondrial DNA (mtDNA). Mitochondria are called the "powerhouses" of the cell. For a dog to be at risk for a mitochondrial disorder, it must inherit a certain ratio of mtDNA with the associated variant compared to normal mtDNA. mtDNA is inherited only from the mother.