

# **GCCF**

# **Breeding Policy**

## **Guidelines for Healthy Breeding**

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## **GCCF Breeding Policy – Guidelines for Healthy Breeding**

### **General Breeding Policy**

This policy applies to all breeds recognised by the GCCF and is intended to provide guidelines to ensure healthy breeding practice.

The GCCF is committed to the breeding of healthy pedigree cats of whatever registered breed, type or conformation. Our policy is to recognise only breeds that are able to live a healthy, contented and “normal” life – able to jump, climb and pursue normal cat behaviour, physically able to mate unaided and to give birth normally, without relying on major medical intervention (unless exceptional and unforeseen complications occur), and without genetic anomalies that impair the cats ability to live and behave in accordance with a cat’s nature (see Health Comes First – *link*). The GCCF will not recognise breeds that do not meet these basic criteria.

**There are** several breeds with physical anomalies that are not recognised and which the GCCF would not want to encourage people to breed. While **cats with** structural anomalies may appear cute there are no positive welfare benefits for the cat conferred by any of them. Some may be purely cosmetic, but others limit a cat’s natural lifestyle and/or cause pain and chronic ill health when the cat is older, shortening the life span. Doubling or trebling such anomalies for novelty or oddity appeal greatly increases the risk of deleterious impact. **. For this reason the GCCF will not consider granting recognition to any new breed based upon structural anomalies, this specifically includes shorten limbs (eg. Munchkin), shortened or bent tails (eg. Pixie Bobs), polydactyl feet (such as Japanese Bobtail), bent or deformed ears (such as Scottish Fold or American Curl), hairlessness, or any miniaturised breed (see GCCF Rules, Section 1).**

Breeds recognised for registration by GCCF cover the full range of body types, coat types and lengths, colours and patterns, but in each case the GCCF standard of points for each recognised breed discourages the breeding of extreme “type” that may lead to physical anomalies which may then become endemic in the breed.

The GCCF requires each Breed Advisory Committee (**BAC**) to have in place a clear registration policy for each breed, **in addition every** BAC is required to produce, publish and promote an accepted breeding policy for its constituent breed(s) by **1<sup>st</sup> January 2011**. **All breeding policies will be reviewed by the Genetics Committee, who will ensure they are comprehensive and consistent with this General Breeding Policy; copies of all breeding policies will be kept for reference purposes at the GCCF Office alongside current registration policies.**

In each case the breeding policy will describe the best breeding practice to be followed to safeguard the integrity, character, distinctive type and genetic health of the breed concerned. The registration and breeding policies between them will describe any genetic anomalies known to exist in that breed and how these will be managed and, where possible, eventually eliminated, including the genetic (and other) tests required, along with the registration status of cats known to be affected with defects (**ie Reference Register, Non-active Register, Genetic Register**). The overall aim is to breed only from cats that are healthy and without detrimental anomalies, but within the context of **ensuring** a sufficiently wide and variable gene-pool from which breeding cats may be selected in order to maintain the breed as a distinct recognised breed of cat.

The GCCF actively promotes genetic and other relevant testing, and offers advice and guidance to breeders, clubs and BACs on the best breeding practice. **However, BACs and individual breeders should investigate testing services for themselves, although the Genetics Committee is pleased to offer information and advice. The links below provide a range of DNA and other tests and give details of the procedures to be followed, prices, etc. In some cases the laboratory may require samples to be taken by a veterinary surgeon and may also require the tested cat to be micro-chipped (see links to labs below for full information).**

<http://www.vgl.ucdavis.edu/services/cat/>  
[http://www.aht.org.uk/genetics\\_tests.html#feline](http://www.aht.org.uk/genetics_tests.html#feline)  
<http://www.catgenes.org/dna-tests.html>  
<http://www.animalsdna.com/feline/>  
<http://www.laboklin.co.uk/laboklin/GeneticDiseases.jsp?catID=CatsGD>

The GCCF Genetic Register exists to be used by breeders as part of a managed breeding system to eliminate any known genetic anomalies and to prevent the spread of such anomalies to other breeds of cat via permitted out-crosses. **The Genetic Register is used to register either untested cats or a proven carrier of a genetic disease or anomaly. Cats on this register may be used by breeders in the process of eliminating that disease, but it is strongly recommended that novice owners should purchase breeding cats that are on the active register or pet cats on the non-active register.**

The GCCF strongly discourages the out-crossing of any domestic pedigree (or non-pedigree) cat to any wild cat species for the purpose of creating a new pedigree breed and will not recognise any such resulting breed(s).

Below is the general recommended systematic approach breeders should adopt in breeding any (GCCF) pedigree breed of cat; an agreed breeding system is an integral part of the Breeding Policy for any specific breed.

## Breeding System

In order to ensure the maintenance of good breed type as defined in any breed's Standard of Points, while allowing scope to further improve aspects of type, coat, pattern and colour, to meet the ideal described in that Standard, all breeders need to have a clear, defined, and well understood **breeding system**. This means the development and management of a breeding programme in which certain cats are affirmatively selected to be bred to others for predetermined reasons. Equally important, it also means that breeders allow no matings until they have given careful consideration to the outcome and consequences for the breed. In particular four key rules must be followed:

- **Health must be the overriding consideration in any breeding programme.**
- **The good (positive) and bad (negative) features of the individual cats should be assessed and weighed against each other before any mating. This includes the risk of passing on genetic faults/anomalies.**
- **When planning a breeding programme, breeders must realise that doubling of the good traits in a cat also results in doubling the defects; the breeding of cats with similar faults should be avoided at all costs otherwise there is a danger of fixation (ie. creating a characteristic which cannot subsequently be eliminated).**
- **Breeders must make themselves aware of the nature of the characteristics they wish to promote or avoid, whether these are due to a dominant factor (which will always be visible when present) or a recessive factor (present due to inheritance from only one parent but not visible until mating with a cat with the same characteristic is carried out)**

The prime motive is to perpetuate the breed concerned as a distinct and recognisable "breed"; to improve the quality of the breed as measured against the Standard; and also to gain success on the show bench.

The skill in breeding lies in the **choice of the individual cats** to be used and **what the results are likely to be should these cats be mated with each other** – these two acts should be given individual attention and considered as completely separate, although interconnected.

## Selection

The phenotype (appearance) of the individual cat is made up of a large number of genetic characteristics of varying expression. The ideal cat is one in which the expression of each of these characteristics is just right in the eyes of the breeder – this means that an intermediate expression will

be required for some characteristics, but a more extreme expression required for others. This expression is controlled by selective breeding. However, selection by itself is not very efficient in eliminating heterozygous genotypes (the producers of variation and diversity) – it is one of the tools available, but has its limitations in terms of creating and maintaining distinctive breed characteristics and type.

### **Inbreeding**

Inbreeding is an inclusive term covering many different breeding combinations and degrees of relationship – including the more distant, less intense; the latter is sometimes referred to as “line-breeding”. In-breeding is consistently more efficient in eliminating heterozygous (varying and diverse) genotypes and increasing homozygous (same) genotype, thereby ensuring a greater likelihood that kittens will closely resemble their parents, which is the essence of any breed of pedigree cat. Used here, the term does not mean close, purposeful, inbreeding of closely related cats (brother/sister, father daughter), but rather the moderate form that results from the mating of not too distantly related (but not directly related) cats (first cousins, half brother/half sister, second cousins, etc). Some in-breeding is essential to stabilise conformation around a definite type and to maintain the integrity and distinct physical and genetic characteristics of any breed of pedigree cat. In-breeding is the act of mating individuals of various degrees of kinship, if continued it produces ever increasing homogeneity in the offspring.

It is important to monitor the percentage intensity of inbreeding for any mating, and through this the risk of introducing or expressing detrimental factors or anomalies. A computer programme such as “Breeder’s Assistant” or similar, will automatically calculate the percentage of inbreeding for any planned mating. A degree of inbreeding between 1% and 25% **over a pedigree of at least eight generations** should be regarded as perfectly acceptable; above 25% breeders should be sure that they have researched the pedigrees and ancestors of both prospective parents very carefully and that they are confident that both lines have been sufficiently tested for there to be minimal risk of defective genetic traits.

**If breeders have details of the cat’s ancestors going back less than eight generations, they should work to lower maximum percentages of inbreeding depending on the number of generations used in the calculation, (eg. 1 – 20% where only six generations are used; 1 - 17% for five generations). In normal circumstances and considering ancestors to at least the eighth generation, it is not sound, acceptable practice to mate cats where the degree of inbreeding is above 40%, where less than eight generations a lower percentage should be used (e.g. not more than 35% in the case of six generation pedigrees; not more than 33% for five generations). Breeders should use this consideration as a key part of the decision making process when considering any mating, and remember: “**The more intense the in-breeding, the more careful must be the selection**”. “**Loss of innate genetic variability must not be too great**”.**

**Anomalies** – the problem of the genetic anomaly is something of which all breeders should be aware – this is not to suggest that such anomalies are common but the cat must be expected to have its quota of defects just as are found in other animals. (See GCCF list of Withholding Faults **and list of known genetic disorders given below**).

It is recognised that breeders may want to test for any genetic anomalies in their own lines and that the mating of very closely related cats is the simplest way to do this, unless a DNA test is available (which they increasingly are – see list at [link](#)). **However, the GCCF requires any kittens bred from the following matings of closely-related cats to be placed on the non-active register in order to prevent the inheritance of any detrimental genetic traits by subsequent generations, unless there is a specific purpose which has been advised by veterinary or genetic counselling and is supported by the relevant BAC and/or approved by Executive Committee:**

- i) Mother to son**
- ii) Father to daughter**
- iii) Full siblings**

In essence the overall approach should be one of balance and moderation in the degree of in-breeding coupled with consistent selective breeding with a clear objective in mind – ie the improvement of a key aspect and/or the elimination of weak traits or defective genes.

**To summarise:** Breeding systems and practices need to operate so as to ensure the gene pool contains enough variation to give scope to continue improving the breed and avoid the danger of either: fixing type too quickly (before the ideal of the standard is reached); **or allowing** deleterious genes to be expressed and fixed in the breed. Breeders need to use selective inbreeding to gain sufficient homogeneity to fix recognisable breed type and all key aspects that determine each individual variety within a breed (ie colour, pattern, coat-length), but with sufficient variation to both enable improvement and maintain health and vigour, avoiding fixation of defective genes or unwanted traits and to ensure the elimination of anomalies. **The GCCF recommends that breeders do not place excessive numbers of good quality cats on the non-active register because they wish to operate commercially restrictive practices. This could potentially reduce the viable, active gene-pool of a breed to unacceptably low numbers.**

The golden rule is that health is paramount and must be constantly and consistently monitored. Any evidence of weakness or the emergence of lack of vigour must be dealt with immediately through modification of the breeding system/programme. No cat with any evidence of health problems or lack of vigour should be used for breeding.

**NB\*\****For further reading on cat genetics and breeding practices refer to: "Robinson's Genetics for Cat Breeders & Veterinarians" by Vella, Shelton, McGonagle & Stanglein, published by Butterworth & Heinemann.*

## **Role of the Genetics Committee**

The GCCF Genetics Committee exists to monitor, guide and advise Breed Advisory Committees, Clubs and individual breeders on the best breeding systems and practices to adopt (*see Terms of Reference for the Genetics Committee – link*); also to share best practice in managing and eventually eliminating detrimental genes from any pedigree breed by a combination of testing and selective breeding.

**Below is a list of the better known genetic disorders affecting cats. A full list of with extensive descriptions of causes, symptoms and management, including testing where available can be accessed via the FAB web-link at the end of this article.**

### **List of more well known genetic anomalies with brief description:**

**Polycystic Kidney Disease (PKD)** – a deleterious gene mutation which causes enlarged kidneys composed of dilated cystic channels, resulting in early kidney failure and death. Test is available.

**Pyruvate Kinase Deficiency (PKDef)** – an inherited disease the main consequence of which is the development of anaemia caused by a lack of the Pyruvate kinase enzyme in red blood cells. The enzyme is necessary for red blood cells to produce the energy to survive. In severe cases a rapid anaemia can be life-threatening. The disease is inherited as an autosomal recessive trait. A reliable test is available that can distinguish clear, affected and carrier status

**Hypokalaemic Polymyopathy** – a disorder which severely reduces potassium retention in the cat causing severe muscle weakness characterised by collapse of limbs and hanging of head; believed to be a simple recessive gene. In severe cases can contribute to early death. Blood sampling study underway, no general test available as yet.

**GM1 & GM2 gangliosidosis** – GM1 is an autosomal recessively inherited lysosomal storage disease. The condition is due to a lack of the enzyme acid  $\beta$  galactosidase which leads to a build up of GM1 ganglioside within cells, particularly of the nervous system, Symptoms include ataxia (uncoordinated walking), and dysmetric (high-stepping walking) with the presence of a tremor and rapid sideways movement of the eyes. GM2 is also an autosomal recessively inherited lysosomal storage disease, in the cat the condition has been identified as being due to a lack of hexosaminidase A and B. As with GM1 the clinical signs are seen at an early stage (1 to 3 months). A PCR test has been identified which can detect the various forms of gangliosidosis..

**Flat-chest syndrome** – there is good evidence that this is caused by a simple recessive gene, but may also have a more complex genetic cause, the disorder results in a kitten with a compressed flattened rib-cage that has difficulty in breathing. It can be fatal in a number of cases depending on the degree of severity. No test is available.

Progressive Retinal Atrophy (PRA) – an inherited ophthalmic condition leading ultimately to irreversible blindness. The underlying cause is dysplasia and/or degeneration of the rod and cone photoreceptor. There are two forms: autosomal dominant retinal dystrophy (Rhd) and rod-cone degeneration. No genetic tests are yet available for either form. DNA tests are available with UC Davis & Laboklin

Orofacial Pain Syndrome – the clinical signs are characterised by exaggerated licking and chewing movements, and pawing at the mouth. In the episodic version the distress usually occurs after eating, lasting between 5 minutes and 2 hours. In kittens the problem resolves when teething is complete, but may reoccur when the cat is adult. The cause is unknown, but the condition shows similarities to trigeminal neuralgia in humans. Many of the affected cats have been closely related, but the mode of inheritance has not been determined.


Muscular Dystrophy – a genetically inherited disease that affects predominantly male cats as it is an X-linked autosomal recessive condition. In this disease the muscles are deficient in a protein called dystrophin, which makes the very weak. This disease is very similar to “Duchenne” muscular dystrophy in humans. There is no cure.

Neonatal Isoerythrolysis (Blood Type Incompatibility) – potentially life-threatening disorder that affects kittens of blood type A that are born to queens of blood type B. If kittens are allowed to suckle maternal colostrums in the first 18-24 hours of life they may absorb significant amounts of maternal anti-A antibodies, which cause haemolysis (destruction) on the kitten's red blood cells. The condition can be prevented by planned breeding, if the blood types of queen and stud are known; blood type B is recessive, blood group A is dominant (blood group AB is distinct from either and inherited separately). DNA testing from buccal swabs is available from UC Davis.

White cats and deafness – caused by progressive degeneration of the auditory apparatus of the inner ear and may affect one ear (unilateral) or both (bilateral). The gene responsible is the dominant gene W with complete penetrance for white coat colour. Test available to detect deafness.

FAB has a full and extensive list of feline disorders and genetic diseases, each includes a full description of symptoms and causes where known. Not all have a test, but where there is one it is stated. Please use link: [http://www.fabcats.org/breeders/inherited\\_disorders/index.php](http://www.fabcats.org/breeders/inherited_disorders/index.php)

*Genetics Committee, May 2009*

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