

**RECOMMENDED
BREEDING POLICY
FOR
THE MANX CAT**



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MANX BREEDING POLICY

1.0. Introduction

This breeding policy accompanies and supplements the Manx Registration Policy and Standard of Points and the GCCF general breeding policy and should be read in conjunction with those documents.

The aim of this breeding policy is to give advice and guidance to ensure breeders observe what is considered “best practice” in breeding the Manx cat. The over-riding objective, as with all breeds, is to produce quality, healthy cats with good type and to continue to improve the Manx cat standard.

The overall aims of the breeding policy areas are as follows:

- a) To promote the breeding of healthy Manx cats with sound conformation, good temperament and free from any defects known to be heritable traits.
- b) To encourage the breeding of Manx which conform as closely as possible to the Governing Council of the Cat Fancy (GCCF) Standard of Points (SOP).
- c) To further the health, welfare and care of Manx Cats at all times, in keeping with their role as domesticated companion cats with their unique “dog-like” personality.

2.0. Origins and History

The Manx cat is one of the oldest natural breeds of cats and is believed to have originated several hundred years ago on the Isle of Man among a population of cats whose common ancestry sprang from the same roots as the British Shorthair. A spontaneous mutation for taillessness occurred at some point creating kittens born without many of the vertebrae that form the tail of normal cats. With the passage of centuries and due to the isolation of the cats from outside breeding, the taillessness phenotype eventually became a common characteristic among the Isle of Man cats, because the mutated gene is a dominant trait. Both longhair and shorthair traits were represented in the original mutation. These cats survived over many centuries, independent of outside interference from man, building a viable, self-sustaining population of free-breeding animals. This confirmed the inherent vigour, soundness and independence of this tailless phenotype in feral animals. The Manx cat has not been artificially derived by man from a naturally occurring mutation which has then been selected to build a novel breed. The tailless phenotype (and all its permutations) is still the predominant feature of naturally born domestic cats on the Isle of Man.

The first documented history of the Manx starts in 1810, but writings date back to the 1750's and it has been a recognised cat breed for over a century. Indeed, the Manx cat was one of the first pure-bred cat breeds recognised by the fledgling ‘cat fancy’ organisation. The first Manx cat was shown at Olympia in 1885, when The Governing Council of the Cat Fancy (founded in 1910 by the combined actions of the 16 established Cat Clubs, one of them being the Manx Club founded in 1901). The Manx cat was frequently seen on the show bench during these years frequently achieving both Champion and Grand Champion status. Since that time the Manx has continued to enjoy considerable success in countries throughout the world. It has also done extremely well in this country at all levels including winning the titles at the National Cat Club show and more recently winning National Cat of the year in 2006. Manx cats have also achieved Supreme Exhibit at the Supreme Cat show

on more than one occasion in the past. Thus the standard of Manx cats in this country is and has always been exceptionally high and should be a cause for some pride in the cat community and more widely in the UK, where we congratulate ourselves on our historical and passionate involvement in development of many pedigree animal breeds.

However, latterly the Manx cat has become somewhat of a minority breed and would be considered on many pure breed registers to be 'at risk'. Fewer Manx kittens have been registered in recent years with the GCCF, although demand for these unique and distinctive cats has remained 'a pace'. This may be in part due to some historical inherent difficulties in breeding the Manx (in part due to a diminishingly small gene pool within the UK), although this is being largely overcome by the determination and persistence of a core group of breeders, passionately dedicated to continuation of this breed. Considerable efforts are being made to introduce new blood-lines, through contacts abroad and into maintaining the health and genetic diversity of the Manx. This vision for the future will, it is hoped, lead to an expanded, diverse gene pool, essential for continued breed development and to ensure health and fitness of cats from these breeding programs and for its survival. Although it is not perhaps the breed of choice for the novice (without a large degree of input from other established and experienced breeders) its unique charm and significant historical relevance to the UK, merit its place in the pantheon of pedigree cat breeds.



Manx, unlike many breeds, may be shown for years - as long as they are willing to go and enjoy it. This is because the Manx matures slowly, and may take as long as five years to reach full growth and potential is as it gets better and better with the passing of time

3.0. Characteristics and Temperament

Manx are easygoing and highly intelligent and can easily be trained; they are also friendly and affectionate, often referred to as the 'Dog Cat' because of its strong desire to be with its

people. Manx are not hyperactive, have a stable, balanced character and will follow you around, helping with whatever you happen to be doing at the time. Manx take well to be kept as indoor-only cats and exhibit dog-like characteristics such as retrieving and burying their toys (a characteristic shared by their near cousins the British Shorthair). They love playing a game of football and are fascinated by water.

The Manx is also a huggable, lovable imp with a silken purr, an almost inaudible meow and a naughty twinkle in its eye. It possesses an uncanny ability to adapt itself to the psychological needs of its people. In a home with children who have been taught gentle animal care, the Manx is often found with the children actively taking part in their play. In short a Manx will stay by your side in work, play and rest.

4.0. Genetic Make-up

The origins of most pedigree breeds lie with *Felis silvestris* or *Felis lybica*, a mackerel tabby ancestor from the north of Africa. Many centuries of evolution and genetic mutations along the way, have led to development of the many diverse cats breed we see around us today. The origins of the Manx are most likely to be similar to those of the closely related British Shorthair, which was first introduced to the British Isles by the Romans. The emergence of the Manx taillessness mutation occurred many centuries later, although its precise origin is unclear. Some historians associate this event with introduction of tailless cats around the time of the Spanish Armada due from shipwrecked vessels. It is postulated that these then interbred with the local 'British' cats to produce the ancestor of the Manx. Many successive years of inbreeding lead to development of the modern Manx cat as we see today. There is no doubt however that these cats were living wild, breeding freely and were a viable, self-sufficient animal able to survive and multiply despite the lack of a tail, obviously proving no hindrance to its normal cat activities.

The Manx, in common with all domestic cats, has 38 chromosomes which hold all the genes necessary for determining the size, shape, colour, pattern and hair length of each individual. There are thousands of genes involved, the majority of which are unknown; however, breeders are able to predict the outcome of the majority of matings via their knowledge of a small group of genes. Over many hundreds of years, genetic mutations have taken place that have resulted in new colours, patterns and hair structure, giving rise to the distinct differences between the cat breeds we recognize today. In the case of the Manx, the key genes influencing colour, pattern and hair length within the breed are as for other breeds.

4.1. Colour Genes

The double quality and texture of the coat is of far more importance than coat colour than colour or markings in the Manx, although coat and eye colour should be in keeping. The Manx, along with the Main Coon and Norwegian Forest Cat, is regarded as a breed which should remain as close to its 'wild type' roots with regards to coat colour and pattern and not become 'over-contrived'. Therefore, most coat colours and their derivatives with white are permitted with the exception of colour-pointed (Himalayan/Siamese colour restriction), chocolate or cinnamon and their dilute derivatives lilac or fawn.

Dense (D) – a gene causing pigment granules in the hair shaft to be evenly distributed, resulting in "dense" colours (often referred to as "Dominant") e.g. black, red.

Dilute (d) - the recessive form of D, causing pigment granules to be enlarged and unevenly deposited in the hair shafts. When homozygous (i.e. dd), this results in the familiar "dilute" series of colours e.g. blue, cream.

Agouti (A) – the “wild type” dominant gene that allows tabby patterns to be expressed. The basic agouti pattern consists of hairs alternately banded with black and yellow; other pattern genes operate to produce the various tabby patterns (classic, mackerel, spotted) seen in the breed. The basic black/yellow pigmentation may also be affected by other colour genes (see below)

Non-agouti (a) – the recessive form of Agouti; when homozygous (i.e. aa), the appearance is changed from Tabby to Self (solid colour) or Smoke (if the inhibitor gene is also present). Occasionally, “ghost” tabby markings may be seen on Self or Smoke cats.

Black (B) – the “wild type” colour gene, resulting in a cat with black (eumelanin) pigment in its hairs (or blue in the dilute form i.e. dd).

Orange (O) – a gene responsible for changing eumelanin (black) pigment into phaeomelanin (red) pigment. The O gene is found on the X-chromosome and is therefore said to be sex-linked. Male cats (genotype XY) with the O gene will be red or cream. Female cats (genotype XX) with one O gene will be Tortoiseshell, those with O genes linked to both X chromosomes will be red or cream. Note that the non-agouti gene’s action is inhibited in the presence of O, meaning that red/cream non-agouti cats still retain a degree of tabby marking.

Full Colour (C) – produces full expression of colour; pigment is evenly distributed along the hair shafts and over the cat’s body.

Dominant White (W) – an epistatic gene, meaning that it masks the effect of all other colour genes present in an individual cat. Cats with one or two dominant white genes will be visually white. If a heterozygous (i.e. only having one dominant white gene) white cat is mated to a non-white, the offspring may be white or coloured, depending on the underlying colour genes of the white cat. White cats may have varying eye colour – blue, non-blue, or odd-eyed. A percentage of white cats are either unilaterally or bilaterally deaf and breeders must take this into account when planning matings. (See registration policy)

White Spotting (S) – Can occur in conjunction with any of the other colour and/or pattern genes; responsible for Bi-coloured and Tri-coloured cats. S is very variable in expression (but is generally considered to be “additive”, so that mating two “any colour and white” cats may produce higher grade white spotted offspring).

Inhibitor (I) – A dominant gene that inhibits the deposition of pigment in hair shafts, resulting in ‘silver’ i.e. white roots to the hair shaft. The length of the white portion is dependent on other genes, including Agouti. Agouti cats with Inhibitor are Silver Tabby or Silver spotted; non-agouti cats expressing the Inhibitor gene are termed Smoke.

4.2. Tabby Pattern Genes.

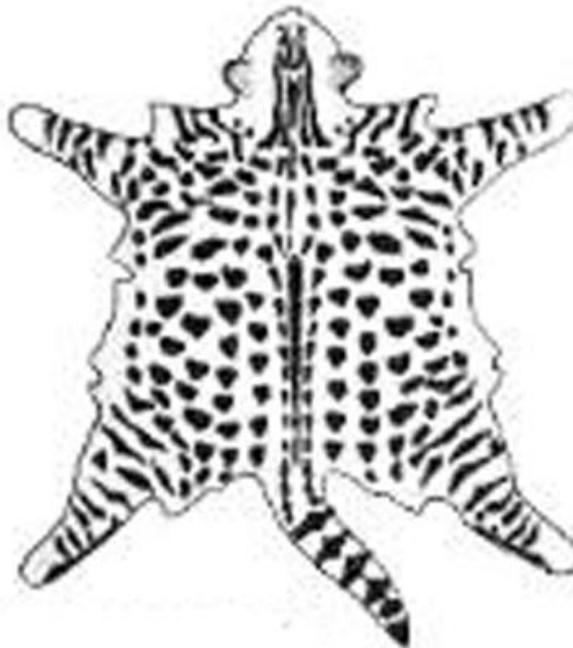
Traditionally it had been believed that the three forms of tabby pattern were inherited as an allelic series; however, it now appears as if at least two and probably three, different loci are responsible for the various tabby patterns (Lorimer, 1995). At one locus are the alleles for mackerel and classic tabby patterns with mackerel dominant to classic; at another locus is the Abyssinian or ticked pattern, which is epistatic (masking) to both mackerel and classic; and at the third locus there appears to be a modifying gene for either the classic or mackerel patterns resulting in the spotted tabby pattern. These can be summarised as follows;

Mackerel (Mc) – the basic tabby pattern of narrow vertical stripes on the body, overlaying the agouti base (i.e. “wild type”)



Mackerel Tabby Pattern – note; narrow stripes and three parallel spine-lines

Spotted (Sp) – the current thinking is that a specific single gene is likely to be responsible for the spotted tabby pattern, breaking up the mackerel or classic pattern into elongated or rounder spots respectively.



Spotted Pattern (a variation of the mackerel tabby pattern)

Classic (mc) – a mutation of the mackerel allele recessive to all other tabby patterns which give a blotched pattern with the characteristic “butterfly” motif across the shoulders and “oysters” on flanks.



Blotched or 'Classic' Tabby Pattern

4.3. Other Coat-Related Genes.

Wide-Banding (Wb) - Postulated by Robinson as a distinct gene although this hypothesis has never been proved – in fact more likely to be polygenetic. Undercoat width genes determine the width of the undercoat whether or not the cat has a (silver) Inhibitor gene. The term “undercoat” refers to the part of the hair shaft closest to the body and includes both guard hairs and the shorter hairs often referred to as “undercoat” hairs. The variability seen in undercoat widths in cats points to the probable polygenetic nature of wide-banding genes. If a single gene, it is likely to be an incompletely dominant gene mutation. The effect serves to push the darker pattern colour up and away from the hair base towards the tip, turning normal tabby patterns into the Shaded or Tipped pattern.

Shorthair (L) – Longhair in cats is recessive to shorthair, and in fact it has been found that 4 distinct mutations are responsible for controlling hair length in domestic cats. The majority of Manx used for breeding are heterozygous shorthair (Ll), therefore longhaired kittens are frequently produced in Manx litters.

Polygenes – these are collections of genes which modify the effect of the main dominant and recessive genes above. A build-up of polygenes serves to enhance the effect of the main colour genes, for example turning the effect of the orange gene from the sandy colour of the ginger domestic tom to the rich vibrant red of the red or red tabby Manx.

4.4. The Manx Gene

The Manx gene (allele) is a dominant gene (known as M) which has multiple effects (i.e. pleiotropic).

The principal effects are:

- The Manx has the same number of spinal vertebrae as any other cat but are on average 1mm shorter - this gives the Manx its characteristic slightly shorter than usual back.
- A variable number of caudal vertebrae (tailbones) resulting in the various observed tail lengths i.e. rumpy, stumpy etc.

The pleiotropic effect of the Manx gene leads to different observable phenotypes i.e.

- a) The dimple rumpy - here the cat will have a small indentation at the base of the spine
- b) The rumpy - a completely tailless cat
- c) The rumpy riser - a cat who has a small rise at the base of the spine caused by a small piece of cartilage or bone which may rise, but must not move sideways
- d) The stumpy - a cat with a tail between 1-5 inches long
- e) The longy - a cat with a tail longer than 5 inches, but shorter than a standard tail

5.0. The Manx Standard of Points

By the beginning of the 20th century standards had been written for Manx cat. The current SOP has also been expanded to take into consideration the greater array of colours and types seen today.

5.1 Type

The Manx is a slow in maturing cat that somewhat resembles the British Shorthair in type with the obvious exception of the tail and a slightly shorter back. The standard has changed very little over the last century; however some changes have been made to update the 'Standard of Points', to clarify certain points and to redistribute the emphasis with regard to certain criteria (see standard of points).

The sturdy, compact body gives the impression of strength. The Manx has a fair-sized, rounded head, short, stocky body, is deep flanked, heavily boned and is broad across the hindquarters. Emphasis must be on the well-balanced cat. Males are usually larger, with proportionally longer bodies and heavier bone. The Manx cat must be medium to large with no tendency to small size or rangyness. Manx have a usual gait and walk normally. The double coat gives a thick, 'well-padded' impression.

5.2. Coat

This should be short and 'double-coated', having a short, very thick undercoat with a slightly longer overcoat with guard hairs. Overall this gives the Manx cat a well padded appearance. The quality and texture of the coat should not be too soft but rather slightly coarse to the touch and is of far more importance than colour or pattern.



5.3 Head



This is fairly large and round with prominent cheeks especially in the mature male. There should be a well defined strong muzzle, a firm chin and an even bite. The muzzle is slightly longer than it is broad with a strong chin and a sweet expression. There is a definite whisker break with large, round whisker pads. The top of the head should be broad and flat.

5.4 Ears

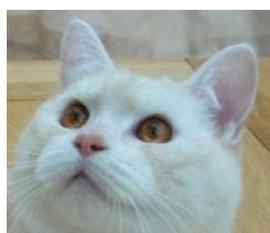
These should be medium in size and open at the base tapering to a narrow, rounded tip, from a flat, broad plane of head, the ears are angled gently outwards, with a gentle flare from the base of the outer ear to the tip

5.5 Nose

The requirement is for a broad, straight nose of 'medium length', without a definite break. In profile, the head is medium in length with a gentle dip from forehead to nose. There should be a well developed muzzle, very slightly longer than it is broad, with a strong chin.



5.6 Eyes



These should be large and round and colour should be in keeping with coat colour (although this is not fixed as with the British Shorthair). The eyes should be set at a slight oblique angle toward the nose, the outer corners slightly higher than inner corners.

5.7 Body

The Manx should have the appearance of a solid, compact, medium to large-sized cat with a broad chest, deep flanks and a short back. The body is solidly muscled, compact and well-balanced, medium to large in size with sturdy bone structure, broad chest and well-sprung ribs. The length of back is in proportion to the entire cat, the height of hindquarters equal to the length of body. The males may be somewhat longer. The rump, should be higher than the shoulder, ideally as 'round as an orange', as asked for in the original standard. There should be no over-shortening of the back or upward tilt of the pelvis, giving the impression of the hind leg being at right angles to the back. There should be a distinct downward curvature of the spine, above and beyond the hock towards the tail region.



5.8 Legs



behind.

Heavily boned forelegs short and set well apart to emphasize the broad, deep chest. Hind legs longer than forelegs, with heavy, muscular thighs and substantial lower legs. Slightly longer hind legs cause the rump to be somewhat higher than the shoulders. The hind legs are straight when viewed from behind. Paws are neat, round with five toes in front and four

5.9 Tail



Apparent taillessness is the requirement of the GCCF standard - The rump should be felt to be completely rounded with no prominent or definite rise of bone or cartilage interfering with the roundness of the rump. In the show cat there must be no tail and the rump should be rounded, appearing to be absolutely tailless in the perfect specimen. A rise of bone or cartilage at the end of the spine is allowed and should not be penalized unless it is such that it stops the judge's hand, thereby spoiling the overall tailless appearance of the cat. The rump is extremely broad and round.

5.10 Size and Weight

The Manx can be seen with most colours and pattern. The Manx is a medium to large, robust cobby, well muscled cat. The average weight and size of a male Manx is approximately 10 to 12 pounds (4.5 to 5.5 kg), comparable to that of its near cousin the British Shorthair. A female can range in weight from approximately 8 to 10 pounds (3.5 to 4.5 kg). Neuters and spays will be heavier than entires, perhaps a kg or so more.

6.0. Manx Health and Genetic Defects

There are a number of myths associated with the Manx, the primary one being that they are a breed with inherent issues with soundness and health. While the Manx have suffered a great deal from a degree of prejudice in this regard, Manx are no more or less healthy than any other breed, if bred intelligently. The Manx can suffer with health issues if care is not taken with implementing a well thought out and robust breeding plan and if good policies are not followed. However, this could equally be said with breeding of any pedigree animal, particularly if a characteristic of that breed is based on a perceived 'altered or extreme phenotype'. In the main, problems that occur in Manx cats are usually isolated, just as in other cat breed, although extra care must be taken in breeding any cat breed with a phenotype perceived as based on extreme characteristics. That having been said it is important that the pleiotropic effects of the Manx gene are understood well and steps taken to minimise any adverse outcomes of a Manx breeding program. These need to be taken seriously by any reputable pedigree animal breeder.

There have been a number of studies on so called 'Manx Syndrome' which have sought to delineate the negative characteristics associated with the Manx mutation. Just as genes determine all the good characteristics they can also contribute to bad ones and this subject is of concern to any responsible breeder and cat lover alike. 'Manx syndrome' was coined as a term by previous investigators, in an attempt to categorise, under a single heading, a number of conditions that may occur in Manx cats. However a syndrome may be composed of a combined set of clinical conditions that manifest together, typifying a particular disorder such as Polycystic Ovarian Syndrome in human beings. There is no definable set of clinical symptoms associated with the Manx mutation that routinely manifest together. Although it was thought to be associated with a number of detrimental physical conditions such as spina bifida and meningocele etc., these conclusions have come from a small number of studies (e.g. reference 5), in which the health and fitness of the original selection of cats for study has come into question. It is now considered that a number of the early studies which concluded that the Manx gene was associated with a significantly increased risk of health problems were flawed, both in design and statistical power (i.e. a small study sample size).

In more recent studies, using a larger number of foundation cats, no significantly large overall association of defects with Manx gene expression has been found (Reference 6). The overall

prevalence of defects in tailless cats from these studies was around 26%. However, many of these anomalies can also be found at reasonable frequency in other pedigree cat breeding programs and would not normally be associated specifically with the Manx mutation i.e. cleft palate, imperforated or micro-perforated anus or umbilical hernias. When these categories of common defect are removed from the statistical analysis, the prevalence of possible Manx-gene related defects is only around 8.0%, with a slight bias toward rumpies at 14% for UK born cats. This is however from mating studies which did not include fully tailed Manx cats. There is also no evidence of a prevalence of other common genetic disorders in Manx cats more than any other breed e.g. polycystic kidney disease (PKD) or Hypertrophic cardiomyopathy (HCM).

Effects of the Manx Mutation

The rumpy, rumpy riser, stumpy and even tailed Manx may not have the full complement of spinal vertebrae, as the term 'spinal vertebrae' includes the cervical, thoracic, lumbar, sacral and caudal/coxxygeal bones. In the main, the Manx cat does have the same number of cervical through to sacral vertebrae (to the start point of the 'caudal' or tail vertebrae at the base of the) tail as any other cat (although exceptions to this can be found in some dimple rumpies, which may have fewer or modified sacral vertebrae). The vertebrae are on average 1mm shorter - which gives the Manx its characteristic slightly shorter than usual back.

The principal affects of the Manx mutation are;

- A gradual curvature from front to back, enhancing the Manx's rounded look
- Variable number of caudal vertebrae (tailbones) resulting the various tail length

However the gene's action in shortening the spine may go too far;

- Resulting in overall fewer spinal vertebrae, which usually means fewer caudal vertebrae (tailbones) but can also mean fewer lumbar and/or sacral vertebrae - if the cat's back is too short.
- Resulting in fusion of caudal vertebrae (tailbones), including kinks and twists in stumpies and tailed cats

These manifestations are highly undesirable and breeding programmes should be followed which minimise any occurrence of these latter effects. Inclusion of tailed Manx and minimising mating of two Manx with shorter than average backs, can help minimise these adverse occurrences in Manx breeding. Associated symptoms found when the Manx gene over shortens the spine are, weak hind legs/ difficulty in walking, damage to the spinal cord and defects in innervation with associated problems with the bowels, bladder, and digestion. Both kittens and adults must be scrutinised closely for any of these defects and this information used in determining ongoing breeding practices. Any adults displaying any of the above symptoms **must not** be used for breeding.

How greatly the Manx allele expresses itself is something a breeder has control over with a well-managed programme which effectively reduces overall risk. These phenotypic manifestations are rare, however rigor must be maintained in assessing the outcomes of particular matings and any evidence of malformations or lack of vigour in the resultant offspring must be acted on. It would be strongly advised that matings between these individuals are not repeated (It must be said that this would apply equally to matings between certain individuals of any breed demonstrating adverse outcomes or defects of any kind in the resultant offspring). Fortunately occurrence of these symptoms are rare in modern Manx

cats, which is partly due to selective breeding, the addition of folic acid to a queen's diet prior, during and for 10 days after mating and the widening of the gene-pool through import and co-operation with breeders abroad, particularly in the European union. With care and proper breeding management, the health and the Manx life expectancy is the same as any other breed of cats. A normal healthy Manx will live to its mid to upper teens and even into their 20's and is no less healthy than any other cat.

7.0. Breeding System

In order to ensure the maintenance of the good Manx breed type already achieved, while allowing scope to further improve aspects of type, overall appearance and coat to meet the ideal described in the Standard of Points, breeders need to have a clear, definite and well understood **breeding system**. This means the development and management of a breeding programme in which certain cats are selected to be bred to others, for predetermined reasons. Equally important, it also means that breeders ensure no matings take place until they have given careful consideration to the outcome.

In any Manx breeding programme **health** must be the overriding consideration; emphasis should be on health, type and soundness and loss of size and vigour should be strongly discouraged. The Manx cat is a medium to large, cobby breed and emphasis should be placed on breeding cats which conform well to **all** characteristics as outlined in the standard of points, with focus not placed solely on taillessness. In particular these key basic rules must be followed:

- The good and bad features of the individual cats should be assessed and weighed against each other before any mating.
- 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.
- 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 mated with a cat with the same characteristic)

The prime motive is to perpetuate the Manx as a recognisable breed; to improve the quality of the breed as measured against the Standard of Points; with a view to success on the show bench. The skill in breeding lies in the choice of the individual cats and how these cats may be mated with each other – these two acts should be regarded as completely separate, although interconnected.

7.1. Selection of Breeding Manx

The phenotype of the individual cat is made up of a large number of genetic characteristics of varying expression. The ideal Manx 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.

- Breeders should keep detailed records on the bloodlines and carefully track previous rumpy to rumpy matings and have a mixture of Rumpy, Stumpy and fully Tailed Manx types in the breeding programme (tailed cats being an absolutely essential part of any Manx breeding programme to maintain health, diversity and soundness).
- Breeders should assess Individual cats before any mating; the most important consideration is the length of the upper spine. Breeding excessively for shorter bodies can cause the individual vertebrae in the upper spine to over-shorten, a practice which should be **strongly** discouraged
- Manx cats to be used for breeding should be given a health screen by a veterinary practitioner and certified free of any overt physical or health defects e.g. intestinal or neurological defects. A signed letter from the veterinarian stating that the cat is free from any overt health issues, including urinary or faecal incontinence is to be submitted to the GCCF. This can be submitted with the certificate or entirety for males and a copy of the letter submitted with the kitten registration documents for females.
- A small minority of white cats are deaf or partially deaf and the modifying factors determining whether a cat is deaf or not cannot be directly controlled in a breeding programme, however by selectively choosing cats with full hearing for breeding purposes the natural progression should be to avoid any increase in the incidence of deafness across the generations. For this reason all white Manx used for breeding are required to take a BAER (brainstem auditory evoked response) test which is necessary to show the cat is not bilaterally or unilaterally deaf. No white Manx kittens can be registered with GCCF unless a BAER certificate of freedom from deafness is supplied. For identification purposes cats must be microchipped prior to testing.
- Breeders should keep kittens until the age of at least 14 weeks but preferably 16 weeks to ensure proper sound development and good health

It is not wise to do rumpy to rumpy matings over successive generations (as unwisely advised in some of the early publications on Manx breeding), or breed together cats with overly shortened backs, as this appears to compound the risk of associated health issues in subsequent generations This is why a good Manx breeding programme controls this risk by including all tail types, periodically introducing fully Tailed Manx within a two to three generation period, to break up generations of tailless-tailless matings. Manx means a particular head and body type, coat quality and eye colour, and most importantly, "Manx" ancestry. Tailed cats from Manx litters (fully Tailed Manx) exhibit all the important body type characteristics, except for taillessness and should therefore be used as a vital part of any ongoing Manx breeding program.

Generally speaking, a sound breeding between a tailed Manx and a rumpy Manx should produce a litter that is 50% tailed and 50% rumpy in most litters but as long as litters are

produced in which all tail lengths appear the breeder may feel that the breeding program is on track. The diagrams illustrate how the alleles are mixed-and-matched to determine the expected *average* result.

Rumpy to Rumpy Matings; in Diagram 1 it can be seen how two tailless Manx parents are expected to produce TWO tailless Manx kittens (Mm) for every ONE tailed kitten (mm), on average that is, a 2:1 ratio of tailless Manx to fully Tailed, on average, over time. To work this out, the alleles of the parents are set out at the top and side of the grid (grey squares); the male parent is at the top. The main grid then contains the recombined alleles from the corresponding tops and sides, which represents all the possible combinations that might be conceived (blue squares) i.e. tailless would include a combination of dimple rumpies, rumpies, rumpy risers, stumpies and 'longies' due to the pleiotropic (variable) nature of expression of the Manx gene.

Manx to Tailed Matings; In Diagram 2 it can be seen how a tailless Manx cat mated to a tailed cat are expected to produce TWO tailless Manx kittens (Mm) for every TWO tailed kittens (mm); that is, a 1:1 ratio of tailless Manx to fully Tailed, on average, over time.

Diagram 1

Tailless Manx X Manx tailless	Tailless Male		
	M	m	
Tailless Female	M	MM- Non- Viable	Mm- Tailless
	m	Mm- Tailless	mm- Tailed

Diagram 2

Tailless Manx X tailed Manx	Tailed Male		
	m	m	
Tailless Female	M	Mm- Tailless	Mm- Tailless
	m	mm Tailed	mm Tailed

7. 2. Inbreeding

Inbreeding is an inclusive term covering many different breeding combinations and degrees of relationship – including the more distant, less intense. It 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. 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. In-breeding is the act of mating individuals of various degrees of kinship, and if continued it produces ever increasing homogeneity in the offspring.

It is important to monitor the percentage intensity of inbreeding for any mating (see GCCF general breeding policy) – 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”. The overall approach should be one of balance and moderation in the degree of inbreeding coupled with consistent selective breeding with a clear objective in mind – i.e. improvement of key aspect and/or the elimination of weak traits or defective genes.

Breeding systems and practices need to operate so as to ensure the Manx 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 deleterious genes being expressed and fixed in the breed. Breeders need to use inbreeding to gain sufficient homogeneity to fix recognisable Manx type and all key aspects that determine the Manx, 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).

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. The golden rule is that health is paramount and must be constantly and consistently monitored; any evidence of weakness, unsoundness or the emergence of lack of vigour must be dealt with immediately through modification of the breeding system. No cat with any evidence of health problems or lack of vigour should be used for breeding. This is true for breeding programmes with all breeds of pedigree cat or other animal.

For further reading on cat genetics and breeding practices refer to reference 4: “Robinson’s Genetics for Cat Breeders & Veterinarians”

7.3. Outcrossing

The Manx breed is a minority one and the gene-pool has previously needed to be widened resulting in unrelated Manx to be imported from the USA. However, the use of Manx cats indigenous to the Isle of Man has always been permitted. The three generation rule applies to such outcrosses to non-pedigreed Manx. This has introduced new colours – or colours which had disappeared over the years due to the shortage of cats. The gene-pool needs to be widened further to ensure the continuance of healthy bloodlines. As stated previously, this can be achieved through introduction of new blood-lines from other countries as long as strict adherence is observed with the ‘degree of relatedness’ of the breeding animals and the calculated ‘inbreeding co-efficients’ of the offspring.

However, the near cousin of the Manx, the British Shorthair is an allowable outcross for the Manx and well-planned, intelligently thought-out outcrosses to this related breed may be useful for increasing genetic diversity. It is the choice of the individual breeder as to how to plan their overall breeding strategy, however health and genetic diversity (i.e. minimising close inbreeding, which may lead to detrimental effects), must be the overriding consideration. Planned outcrosses to other breeds should perhaps be for the more experienced breeder, with a sound understanding of the underlying genetics and the possible outcomes and effects of these programmes.

When considering out-crosses to the British Shorthair, the breeder must take into consideration a number of factors;

- Breeders should be aware that the British Shorthair is not the same as the Manx type and therefore the first generation kittens from an outcross mating with ancestors with differing type yields more variability and less consistency in the type of kittens which can last for two to three generations.
- Breeders should understand that developing an outcross line requires commitment to selecting kittens with the most prominent and desirable ‘Manx’ features for future breeding and should aim to offset any poor features

- Breeders would be required to ensure that any Manx cats or Manx Variants from which they breed shall be registered with the GCCF in accordance with the Manx registration policy (currently under review)
- The progeny of such matings would be Manx variants. Subsequent progeny from Matings of Manx x Manx Variant may be both Manx and Manx Variants.
- The majority of matings in the future would continue be between Manx x Manx but also matings between Manx x approved British Shorthair and Manx x Manx Variant may be including the breeding programme.
- When undertaking an outcross mating the primary objective should be to expand the Manx gene pool and requires careful planning as to how the offspring could be used for breeding in order to maximise the introduced genetic diversity gained and minimise dilution of Manx phenotype and character.

7. 4 Guidelines to Outcrossing

Breeders should ensure, to the best of the knowledge that any Manx (or Manx Variants) from which they breed from are of sound temperament, free from hereditary defects, (including those listed in the GCCF Standard of Points), and conform as closely as possible to the Standard of Points. It is therefore advisable to research the pedigrees thoroughly for selection of adult breeding Manx.

- All cats, both Manx and British Shorthair selected for outcrossing programs should be thoroughly researched, of sound temperament and scanned for known phenotypic and genetic defects (ideally through genetic testing). Selected breeding animals should be free from hereditary defects. Selected British Shorthairs may need to have more nose than those generally accepted as show specimens
- Blood types for outcrossing should be ascertained where appropriate to avoid blood type incompatibility
- DNA testing should be used where appropriate to ensure that cats used are free from testable genetic diseases
- Pedigrees should be investigated as much as is reasonably feasible to ensure that cats used do not descend from ancestors with hereditary diseases for which DNA testing is not yet available
- Breeders should learn how to understand their pedigrees and their associated history, the breeding value of their Manx cats and how to make decisions in their breeding programmes that are 'best for the breed' in its ongoing development.

Co-operation between Manx and British Shorthair breeders, the GCCF and other registration bodies and with breeders internationally, should ensure that diverse breeding lines are maintained and that breeders have sufficient options to maintain low inbreeding coefficients.

8.0 References

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9.0 Acknowledgements

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Gallery of Titled Manx Cats



Champion and Premier Katzenjammer & Champion and Premier Bonhaki (1902)



**Grand Champion & UK Supreme Grand Premier Tutlebury Tudor
(GCCF Supreme exhibit 2003)**



Bronze Grand Champion Encore Izoo Massamatta (Australia)

Other Manx Cat Pictures



B and R Series Dates seen: 1904 – 1919 "Kys ta Shiu?" (<i>How are You?</i>) Silver Tabby Series 1904 – 1919	

