

**RECOMMENDED  
BREEDING POLICY  
FOR  
THE BURMESE CAT**

Photo: Ian Jarvis



## BURMESE BREEDING POLICY

### Origins and History

Burmese cats have been known for centuries past living in Burma. An illustrated scroll treaties, known as the *Cat Book of Poems (Tamra Maew)* is credited to the Ayutthaya period of Thailand's history (formally Siam) of 1350 – 1767 and was most probably written towards the end during the early 1700s. This text is the oldest recorded document to describe various domestic breeds of cat. In all 23 breed types are featured, the breed types represent a fascinating treasure trove of colour and pattern mutations that existed at that time and possibly even earlier. Among the types featured is one with the Thai name of *Thong Daeng* (copper) or *Suphalak* (meaning excellent). It was said to be a much-revered, rare and valuable cat. It is generally accepted today that the Thai Copper is the direct ancestor of the beautiful breed that is the Burmese.



A contemporary example of the "Copper" or Thong Daeng. These cats show a strong resemblance to the original Burmese cats Dr Thompson would have encountered.



A Siamese/Burmese hybrid, now known to us as a Tonkinese. Note the pale turquoise eye-colour.

Another breed in the Book of Poems was the Wichien Maas (Moon Diamond), examples of the Wichien Maas were sent to England during the 19th century and were exhibited at the world's first major cat show in London in 1871. This cat was the Siamese, so named for its country of origin. Following the enormous success of the first cat show, other shows were held and at some of these cats were seen that resembled the Siamese but were darker in body colour. They were regarded as being poor examples of the Siamese and not as valuable, and were often referred to as Chocolate or Dun Siamese. It is now realised that there is a high probability these were in fact the ancestors of the Burmese, the Thong Daeng, but because they won few advocates they disappeared from the cat scene for about 60 years appearing to have died out in Britain. Both breeds appeared then to have the same body type but the "Chocolate" version was a darker form with yellowish rather than blue eyes.

This little cat next surfaces in 1930 when Dr Joseph C Thompson, an American psychiatrist acquired a walnut brown female cat in Rangoon, Burma and subsequently imported her to San Francisco where he lived, (an alternative story is that he obtained her in America from a sailor who'd brought her from Burma). He named this little cat Wong Mau and she is the ancestor of all Burmese in the UK (and elsewhere). Many people initially regarded Wong Mau as a dark Siamese, but Thompson disagreed and thought she had a different genetic make-up, so he set out to prove this via a planned breeding experiment.

As there was no other cat like Wong Mau in the USA, Thompson mated her to a seal-point Siamese called Tai Mau, who had been imported from Thailand. This litter produced kittens of two "colours" seal point similar to Tai Mau and darker brown pointed kittens similar to Wong Mau. However when Wong Mau was later mated to one of her dark coloured sons, Yen Yen Mau, a third "colour" was produced, a much darker seal brown cat with only slightly darker points which was named Burmese. What this demonstrated is that Wong Mau's "colour" was in fact what we now recognise as a Tonkinese as she obviously carried one Siamese and one Burmese gene.



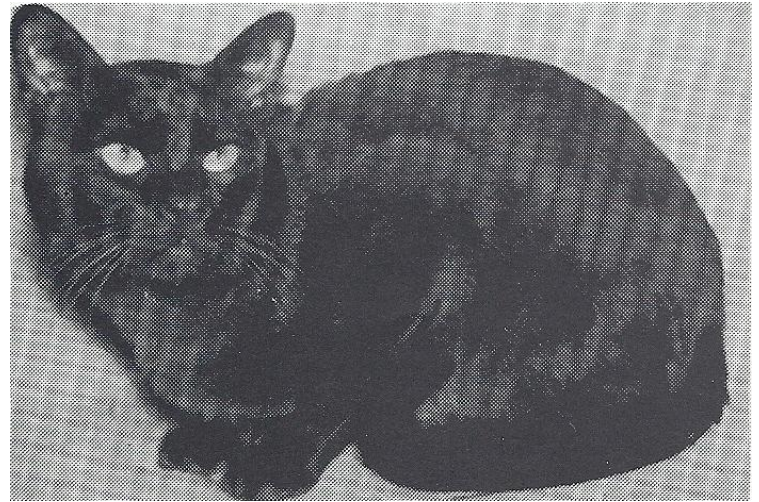
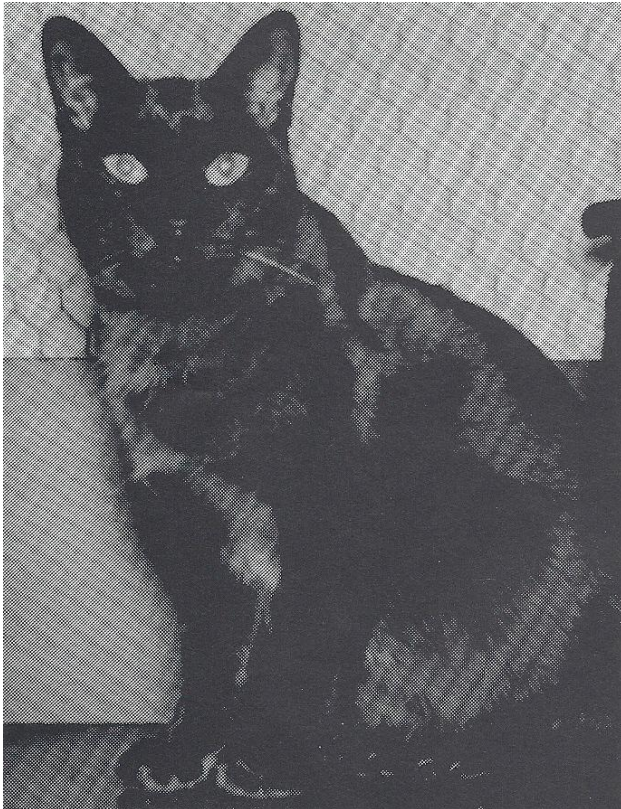
**Wong Mau with litter of Siamese, Burmese and Hybrids**

	$c^b$	$c^s$
$c^b$	$c^b c^b$ <b>Burmese</b>	$c^b c^s$ <b>Tonkinese</b>
$c^s$	$c^b c^s$ <b>Tonkinese</b>	$c^s c^s$ <b>Siamese</b>

In developing the breed from the early 1930s onwards Thompson and his small group of collaborative breeders used a further nine named seal-point Siamese cats in addition to Tia Mau, and imported three further Thong Daeng cats from Burma, although only one of these seems to appear in the subsequent breeding programme, so it is likely that no surviving offspring from the other two (if ever produced) were bred on. From these foundation cats the emerging breed was closely line bred using both hybrid (Tonkinese) and Burmese coloured cats to establish the Burmese in the States. The Burmese quickly gained popularity and was recognised by the CFA in 1936, however due to the extensive out-crossing to Siamese in order to increase the population the breed was

compromised, leading to the US cat registry suspending recognition of the Burmese as a purebred cat in May 1947 (this suspension was lifted in 1954)

In 1949, the first three Burmese were imported into Britain from this American stock: Casa Gatos da Foong, a male, along with Chindwins Minou Twm and Laos Cheli Wat both females. These three cats were joined in 1953 by two further males, Casa Gatos Darkee and Darshan Khudiram and another female, Folly Tou-Po. These six cats formed the basis of the breed in the UK. In 1958 another import, a Burmese Siamese hybrid called Chira Tan Tockseng was added to the UK gene-pool.



***Gatos Casa Darkee***

***Laos Cheli Wat***

The first Blue Burmese appeared in the UK in 1955 from a litter sired by Darkee, more appeared in the US and the Chocolate gene also first appeared in the US in 1959 and subsequently four Chocolates, two males and two females were imported into the UK in 1969 and from these imports the first Lilac appeared in 1971. Two additional Brown Burmese were also imported in 1969, a male and a female. The Chocolate and Dilute genes may have been present (carried) by Wong Mau, but are more likely to have been introduced via the outcrosses to one or more of the seal-point Siamese males used in the breeding programme.

During the 1960s a deliberate programme was begun in the UK to introduce the Orange gene following the escape and accidental mating in 1963 of a Blue Burmese, Pussinboots Blue Truepegu, with a red tabby shorthaired non-pedigree male. One of the resulting kittens, a Black Tortie named Wavermouse Galapagos, was kept and mated back to a Brown Burmese. Two other unrelated matings took place in the hope of widening the gene-pool. Chevening Susy, a tortie and white female carrying the Siamese gene was mated to a Burmese, Ch Soondar Mooni to produce Chevening Meringue, a red male; and Arborieal Fenella a Brown Burmese female was mated to Southview Havoc, a Redpoint Siamese to produce two torties, Kudos Farrago and Kudos Fantasia. These were mated on to Burmese and formed the foundation for the Red, Cream and Tortie colours recognised today.

### **Genetic basis/foundation gene-pool**

As explained above the Burmese breed in the UK is descended from one original cat, Wong Mau, she and her immediate descendents were out-crossed to a number of Siamese, (ten individual Siamese can be identified within the recorded breeding programme followed in the USA during the 1930s and '40s) and supplemented by probably two additional Burmese hybrid (Thong Deang) imports. The Burmese gene-pool imported into the UK between 1949 and 1970 was based on these thirteen cats. The development of the red, cream and tortie colours broadened the gene-pool further with the introduction of a further three out-crosses to the breeding programme; years later another, a British Red Tabby called Cornish Treacle, was mated to a Burmese and one of his descendant appears in Burmese pedigrees. This gives a total current gene-pool based on 17 or so individual cats. This is a very small genetic basis for a pedigree breed, one of the most limited of any recognised breed of pedigree cat in the UK. It is something breeders must pay particular regard to in continuing the breed into the future, especially as the gene-pool in the UK has been closed since 1992 – which means no imported Burmese can be registered with GCCF and used in the breeding programme and no outcrosses to other breeds have been permitted, for registration within the terms of the Burmese Registration Policy, for some forty years (Burmese out-crossed to Asians are permitted within the Asian Registration Policy, and similarly for the Devon Rex).

### **Genetic Make-up**

All domestic cats are descended from a wild ancestor (probably either *Felis silvestris* or *Felis lybica*) a mackerel tabby patterned animal, and thus all domestic cats are of an underlying genetic tabby pattern. All cats have 19 pairs of chromosomes upon which there are many thousands of genes that govern the eventual shape, size, sex, colour, pattern, and hair length of the individual animal. Over the generations a number of mutations have occurred and selective breeding has been used to isolate these to

produce the various pedigree breeds we see today. In the case of the Burmese a key specific gene mutation ( $c^b$ ) became the basis of the breed. The key gene mutations influencing the appearance of the Burmese are:

**Agouti (A)** - the natural “wild” gene that is the basis of the tabby cat. The base agouti pattern is bands of black on a yellow background; in the cat this is overlaid with one of the tabby patterns. The Burmese is a non-agouti breed, however, it is important to understand that all cats have an underlying tabby pattern; this can sometimes be seen as faint tabby markings particularly on the legs, tail and face on “self-coloured” cats.

**Ticked (T)** – one of the four tabby patterns, this is caused by an incompletely dominant gene which removes most of the stripe pattern leaving the ticked agouti base pattern on the body with minimal overlaying stripes on legs, chest (necklace) and face. Selective breeding of Burmese to eliminate any evidence of ghost tabby markings has in effect selected for Ticked Tabby based cats (as opposed to Mackerel or Classic tabby based cats which frequently show some ghost barring particularly in red and cream coloured cats). Thus it is likely that vast majority of Burmese cats are Ticked Tabby based.

**Non- agouti or “hypermelanistic” (a)** - a recessive gene mutation that turns the original “wild” tabby cat into a self black by overlaying the agouti base colour with melanic pigment, making the whole animal appear black, although often in certain light the underlying tabby pattern may still just be discernible. Other genes work to change this black pigment to other colours (see below).

**Burmese Colour Restriction ( $c^b$ )** – a mutation on the albino allele one step up from the Siamese (Himalayan) gene ( $C^s$ ). This reduces the amount of pigment produced in the coat but, because it is thermo-sensitive, the pigment is darker at the points, where the skin is cooler and (slightly) lighter on the body which the skin temperature is warmer; the action of the Burmese gene causing a genetically black cat to turn sepia brown, a red cat to turn pale tangerine. The Burmese Colour Restriction gene is incompletely dominant over the Himalayan gene at the same locus on the chromosome with the result that the inheritance of one Burmese gene and one Himalayan gene results in colour restriction mid-way between the two, i.e. what we now recognise as Tonkinese Colour Restriction ( $c^b c^s$ ). Wong Mau was of Tonkinese colour restriction as she had one of each of these genes.

**Chocolate (b)** – a mutation of the basic black non-agouti gene which modifies black into dark brown; the Burmese gene further modifies this colour mutation to produce a paler milky coffee coloured body with darker chocolate brown mask and ears.

**Orange (O)** – this is a mutation on the X chromosome and is thus sex-linked. The gene eliminates all melanin pigment (black and brown) from the hair fibres, replacing it with phaen melanin, a lighter compound appearing yellow or orange depending on the

density of pigment granules. The O allele is also epistatic over the non agouti genotype; that is, the agouti to non-agouti mutation does not have a discernible effect on red or cream coloured cats, resulting in these self-coloured cats displaying tabby striping independent of their genotype at this locus. This explains why you can usually see some tabby pattern on red and cream coloured Burmese cats, even if only on the head/face and often as ticking on the body. Rufus polygenes, as yet unidentified, affect the richness of the orange gene's expression.

**Dilute (D)** – a recessive gene which reduces and spreads out the pigment granules along the hair-shaft and turns a seal brown to blue, chocolate to lilac, and red to cream.

**Dilute Modifier (DM)** – a dominant gene that is not recognised by the Burmese Registration Policy, however there is increasing anecdotal evidence of its existence within the UK Burmese gene-pool provided by judges assessing Cream, Lilac and Lilac Tortie coloured Burmese at shows. A genetic test for the Dilute Modifier has not yet been perfected, but is likely to become available in the foreseeable future, in the meantime the Burmese BAC has resolved to monitor the situation until such a test is commercially available when cats of suspect colour can be tested to establish their colour genetic make-up.

**Long-hair (L)** – a recessive gene not present in the Burmese breed which is fundamentally a short hair breed, but included here for completeness. All Burmese cats are LL (ie short-hair).

**Inhibitor (I)** – not present in the Burmese breed, the Inhibitor gene radically reduces the production of melanin deposited along the hair-shaft and when present causes the cat to exhibit a silver base to each hair. All Burmese cats are ii (ie. Non-Silver)

**Polygenes** – these are collections of genes which modify the effect of the main dominant and recessive genes above. A build-up of polygenes creates a bigger effect, for example a collection of certain polygenes increases the length and density of the long-hair gene to create the Persian, and a build-up of polygenes serves to enhance the effect of the main colour genes, turning the effect of the orange gene from the sandy colour of the ginger domestic tom to the rich vibrant red of the Red Persian, British or Burmese. It is likely that a group of polygenes, some of which have a positive effect and others a negative effect on the main genes is the reason for variation in the degree of warmth, coolness, richness or depth of colour in all Burmese, careful selection by breeders of breeding cats which exhibit the correct build-up of desirable poly-genes will generate the much sort pinkish cast in the Burmese Lilac or the desired warm rich milk Chocolate colour.

So, in summary, the genetics involved in the ideal Burmese cat are complex. Not only are there many interacting genes, but genes sometimes do not express themselves

fully, or conflict with one another. They can also be affected by external factors, for example, the Burmese Colour Restriction gene is sensitive to air temperature allowing more melanin to be expressed in colder conditions and inhibiting melanin when warmer. Various polygenes, epigenetic factors, or modifier genes, as yet unidentified, are believed to result in different phenotypes of colouration, some deemed more desirable than others

### **Burmese Genetic code:**

Brown Burmese carrying no colours: ***aa BB c<sup>b</sup>c<sup>b</sup> dd ii LL***

This is a non-agouti (non-tabby) black short haired cat, but because the Burmese gene ( $c^b c^b$ ) is present this converts the black (melanin appears black when the molecules are close together, but it is actually dark brown) into Sepia or Seal Brown by spreading the melanic molecules a little further apart (and further apart the warmer the body is which is why it is lighter on the hotter parts of the body such as the tummy). No Inhibitor (i) (silver) gene is present and no long-haired gene (L).

A Blue Burmese would be ***aa BB c<sup>b</sup>c<sup>b</sup> DD ii LL*** as the dilute gene is operating on the Brown colour further diluting the number of melanic molecules so the colour appears a warm blue-grey.

### **Breeding System.**

An agreed breeding system is an integral part of the Breeding Policy for any specific breed. 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 means that breeders should allow no matings unless they have given careful consideration to the outcome and any future 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 may also result in doubling any defects; the**

**breeding of cats with similar faults should be avoided at all costs otherwise there is a danger of fixation (i.e. 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 gene (which will always be expressed when present) or a recessive gene (only expressed in the homozygous state i.e. where the cat inherits the gene from both parents).**

The prime motive is to perpetuate the Burmese as a distinct and recognisable breed and to improve the quality of the breed as measured against the Standard (with consequent success on the show bench). However it must be noted that not all good show cats reproduce themselves and some cats which do not conform well to the GCCF SOP can produce kittens of extremely good type. So allowing breeding from show-quality/superior cats only, does not always necessarily work out the way one would expect. Some emphasis on intelligent and well thought out breeding with a good breeding plan is better than the random mating of two “superior” cats. 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 of the individual cat is made up of a large number of genetic characteristics of varying expression. The ideal Burmese 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.

### ***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 – 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”***. This is particularly important for all breeders of Burmese because the genetic variation within the breed is very limited.

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.

### ***Maintaining the future genetic health of the Burmese breed***

Breeding systems and practices need to operate so as to ensure the limited Burmese 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 maintain recognisable Burmese type, 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). Overuse of any one particular stud cat should be avoided as this can further limit genetic diversity and rapidly spread any undesirable recessive factors (NB Hypokalaemic Plymyopathy, see Genetic Disorders on Page 17, is thought to have expanded within the breed because of the overuse of one popular stud cat).

This is a crucial concern for the breeder of Burmese because of the very limited amount of genetic diversity provided by the small number of foundation cats. Very serious consideration has been given to identifying suitable outcrosses in order to broaden and enrich the current gene-pool and increase the genetic diversity of the Burmese in the UK.

The ***first consideration*** is to lift the ban on importing Burmese bloodlines from abroad and the Burmese BAC is currently discussing how this can be implemented (*from: insert date*) without increasing the risk of introducing the syndrome of meningoencephalocoele and related craniofacial abnormalities known to be present in some lines with “contemporary” (American) Burmese ancestry. (The Comparative Genetics Laboratory of Dr. Leslie Lyons at the School of Veterinary Medicine at UC Davis is currently searching for a marker and the gene causing the Head Defect).

The **second consideration** is to allow out-cross matings to a similar breed with the specific objective of introducing some new genetic variety to re-invigorate and enrich the gene-pool. The obvious out-cross is to the Asian Variant, which is in phenotype exactly the same in type, colours, coat, etc., as the pure-bred Burmese; the Asian gene-pool is based on approximately 38-40 cats (including the 17 which are the basis of the Burmese breed) so potentially can bring the genetic diversity of up to another 20 plus individual cats to the Burmese gene-pool. The Burmese BAC has agreed that the mating of Burmese to Asian Variants should be allowed from (*insert date*) providing the following conditions are met:

- The Asian Variant does not carry the long-hair gene, a DNA test for long-hair is available.
- The Asian Variant is not in fact a Smoke exhibiting very minimal silver such that it appears to be a Variant. Until a test for Silver is commercially available (possibly by 2012-13) no Variant should be used with a silver ancestor in the proceeding three generations (ie parents, grandparents or great-grandparents).
- The Asian Variant is not masking the Dilute Modifier gene, which although a dominant gene only expresses in dilute colours (blue, lilac or cream), thus a Brown, Chocolate or Red Variant with Caramel in the pedigree within the past five generations should/must not be used in the Burmese breeding programme. The safest coloured Variants to use if there is any evidence of the presence of the Dilute Modifier in the pedigree is a Blue, Lilac or Cream Variant.
- The Asian Variant is not carrying the Cinammon gene, very few Asian lines have Cinammon or Fawn in the pedigree, however a reliable DNA test for Cinammon is available.

The range of DNA tests available now, and at very reasonable cost, allows for the testing of potential Asian Variants to ensure they do not carry the long-hair or Cinnamon gene, in the very near future a test will also be available for the Inhibitor (silver) gene which as stated above can on rare occasions show minimal expression even though it is a dominant gene. This will mean that the genetic make-up of all potential out-crosses can be accurately known thus preventing the introduction of any unacceptable genes to the Burmese breed.

**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 Page 17: Genetic Defects).

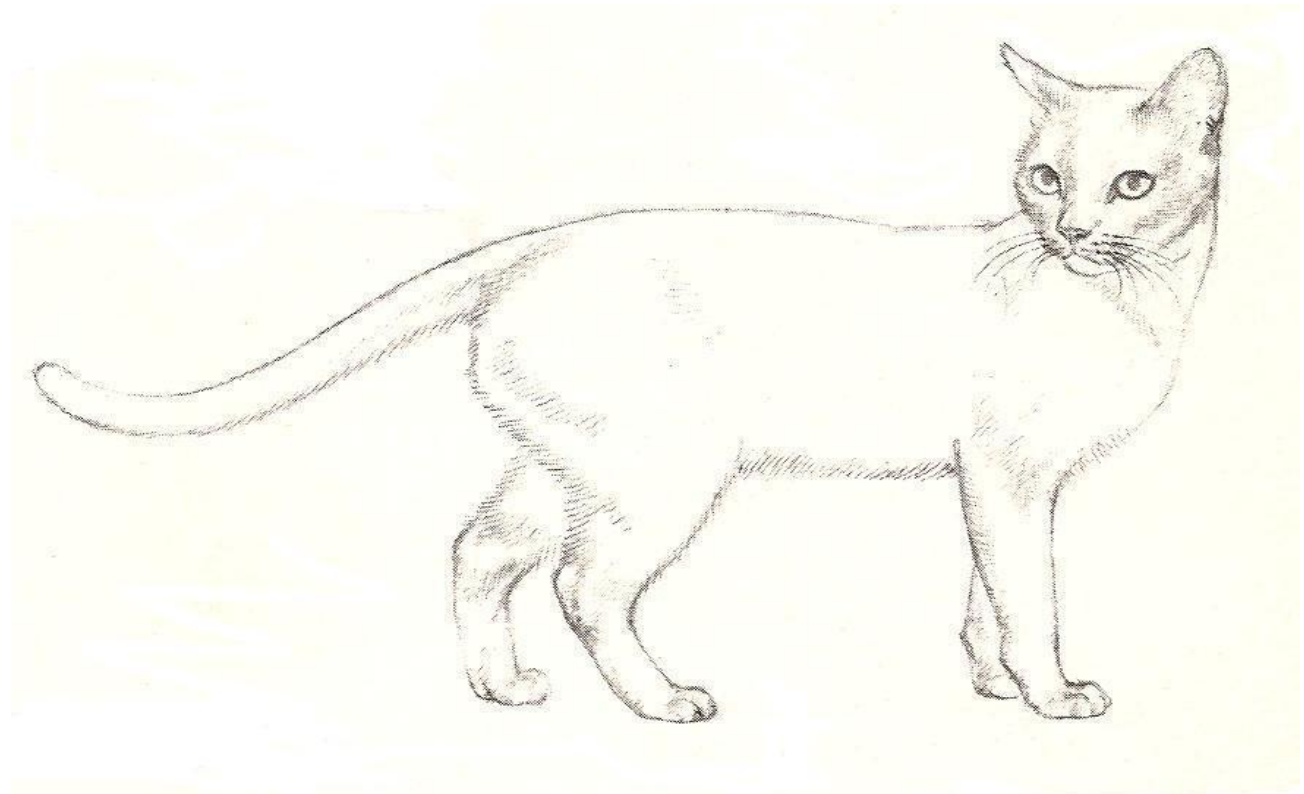
The golden rule is that health is paramount and must be constantly and consistently monitored; any evidence of weakness or the emergence of lack of vigour must be dealt with immediately through modification of the breeding system. No cat with any evidence of health problems or lack of vigour should be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

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

### **Type**

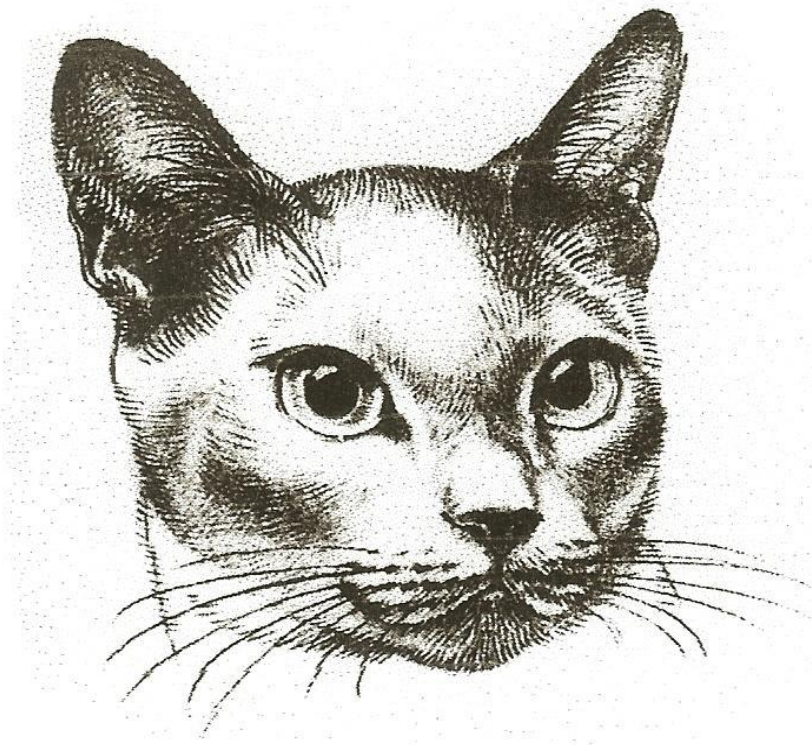
The physical look of the Burmese cat has evolved over the eighty years of the breed's history in the west. Wong Mau and her immediate descendants were of virtually the same type as the Siamese breed of that time. Since the 1950s the Burmese in the UK has developed the elegant foreign type we see today, the short wide wedge-shape to the head, the distinctive and unique eye-shape and the fine single coat have been developed and perfected so that the breed today looks noticeably different from the original ancestors. Breeders have worked hard to achieve the standard we see today, but in doing so they have worked with an increasingly limited gene-pool and now need to consider how to preserve good phenotype while ensuring the genetic health of the breed in the 21<sup>st</sup> century.

*Fig1*





**Fig 2**



**Fig 3**

## **Coat**

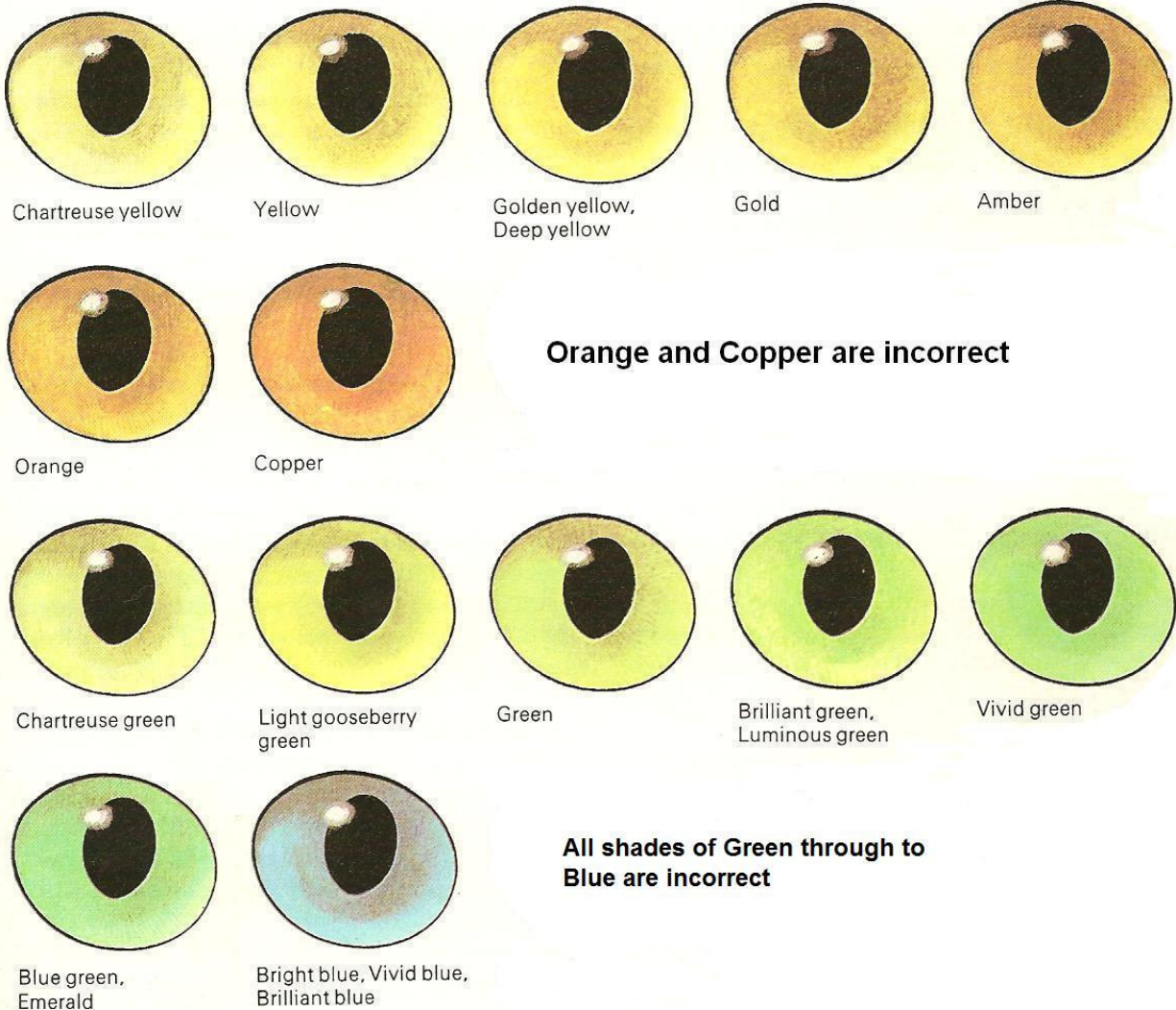
Not sufficient attention has been paid in recent years to the quality of coat length and texture. The ideal Burmese coat should be short, fine and lie close to the body with a smooth satin-like texture which is another key feature of the breed. However, most Burmese currently bred, as evidenced by those appearing on the show bench, have what may best be described as a medium short coat, and some are over-long and occasionally tending towards thickening of the individual hairs. Breeders are encouraged to pay close attention to coat texture and to aim to correct any tendency towards longer, thicker coats by selecting a mate with a better coat texture (more typical) in an effort to correct this tendency in successive generations. It is likely that the slightly longer thicker coats are caused by a build-up of poly-genes for expression of these factors. If the close single satin-like coat is to be maintained breeders should aim to reduce the build-up of such polygenes by following a careful selective breeding programme



## **Eye-colour**

Eye colour may range from pale yellow chartreuse through richer chartreuse yellow to clear yellow, golden yellow and amber. Green and orange are incorrect; the eyes should not be so lacking in yellow tone that they are more blue/green at one end of the spectrum, nor so rich an amber that they are more orange than amber yellow at the other end of the spectrum. Burmese eye colour is sensitive to light and is best assessed in good north light, it can change tone and appear paler and sometimes more

green than yellow in certain light. Occasionally a green rim may be evident around the pupil, this is undesirable. Eye-colour tends to fade with age; kittens may exhibit a “muddy” and indistinct tone as eye-colour develops and changes with maturity. Breeders should monitor the eye-colour regularly and consider the need to improve colour when selecting prospective parents for breeding. The objective should be to maintain good chartreuse yellow or clear golden yellow colour.



## Coat Colour

Breeders aspire to produce a Burmese with an even coat colour on the body which graduates smoothly to a slightly darker tone on the ears and face, and very slightly darker on the tail, and a paler tone on the under-parts; free from any evidence of ghost tabby markings and with colour which ideally would graduate smoothly from a dark tone at the hair-tip through lighter tones towards the base of the hair-root. This is a

challenge, especially as the Burmese Colour Restriction gene is sensitive to environmental temperature and conditions. In recent decades possibly too much attention has been paid to improving and maintaining type and not enough to improving coat texture and the quality, depth and richness of coat colour. Colour is primarily determined by the major gene mutations for Brown (B) (genetically Black) Chocolate (b), Red (O) and the dilute gene (d), but the depth and tone of the colour is affected by polygenetic influences and breeders should pay due regard to selecting for and building the groups of polygenes affecting the quality of the respective colour they are seeking to breed. It is likely that, for example, a build-up of rufus polygenes will not only improve the richness and vibrancy of the Red Burmese, but also the quality of Chocolate, Brown and give the elusive yet desired pinkish cast of the perfect Lilac.

Kittens are of lighter colour which darkens as they mature, the BCR gene is sensitive to heat so cats kept in colder temperatures will darken noticeably when compared with cats of same colour living in a centrally heated house.

Breeders should be watchful for any evidence of a cluster of white hairs or a white patch, generally these are seen between the forelegs or back legs, or on the chest or throat. White hairs anywhere on a Burmese of any colour are a fault.



## **Brown**

The colour is a rich warm seal brown on the body merging gradually to a slightly darker seal brown on the mask and ears, and a very slightly lighter tone on the under-parts. The colour tone should not be so dark as to appear almost black nor so light as to show

any tendency toward Chocolate. The colour should graduate down each hair shaft such that the tip is rich seal brown lightening gradually to pale brown at the root, excessively pale colour at the root is undesirable. The colour should be free from any ghost tabby markings anywhere on the limbs, tail or body, however a faint “M” is usually visible on the forehead above the eyes.

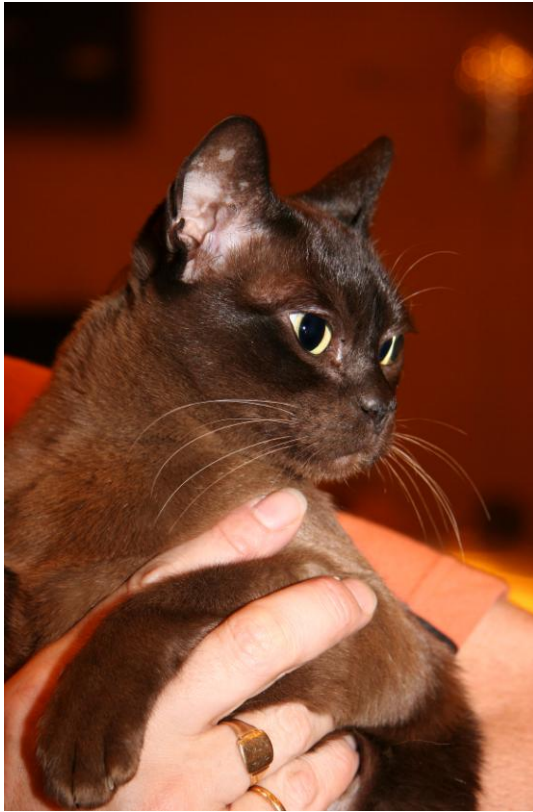


Photo: Ian Jarvis

## Blue

The desirable body colour is a soft warm medium blue grey, merging to a slightly darker soft blue grey on the face and ears, and a slightly lighter tone on the under-parts; a darker pewter blue-grey is sometimes seen and is acceptable. There should be a distinct silver sheen visible on all rounded areas, particularly the limbs, feet, face and ears. Blue kittens sometimes have a brownish-fawn overtone which almost always fades as the kitten matures into an adult; a brownish fawn overtone in an adult Burmese is undesirable. The colour should be free of any evidence of faint tabby markings, except for a faint “M” on the forehead above the eyes.



Photo: Alan Robinson

## Chocolate

The colour is described in the standard as a warm milk chocolate, but may be better described as a warm milky coffee colour on the body merging to a rich warm milk chocolate colour on the face, ears and tail. An excessively dark colour tending towards the overall appearance of a Brown Burmese is incorrect; equally a pale body colour with noticeably contrasting darker mask, ears, limbs and tail is undesirable. A cold tone to the chocolate colour is incorrect and will be penalised on the show bench.

As indicated above, the colour should be a rich chocolate at the tip of each hair which then graduates to a paler chocolate towards the hair-root, however there is a tendency in some Chocolate Burmese for the colour to move quite sharply from a dark tip to a very pale tone down the hair-shaft to the root, sometimes giving almost a “Smoke” effect. This is undesirable and breeders should pay particular attention to selecting to eliminate this tendency. Any evidence of ghost tabby markings anywhere, except for a faint “M” on the forehead, is undesirable.

Photo: Thomas Goss



Photo: Anna Shafto



## Lilac

The ideal colour is a pale, delicate dove-grey with a slight pinkish cast overall; creamy beige, excessively dark or cold bluish tones to the dove-grey are incorrect and undesirable, but quite prevalent. The Lilac variety of Burmese would benefit from some careful attention from breeders to select paler coloured cats with the true pinkish cast. As with the Blue, the rounded areas of the body exhibit a silvery or frosted sheen, which is particularly noticeable on the face, ears, limbs and paws. All Lilac Burmese should be clear of any evidence of tabby markings except for a faint “M” mark which is usually visible above the eyes.

Photo: Alan Robinson

Photo: Anna Shafto



## Red

The colour should be a rich vibrant medium tangerine, merging to a richer and brighter in tone on the mask and ears and ideally with minimal tabby markings – perhaps a smudge of tangerine on the knees and elbows, a faint broken necklace and an “M” mark on the forehead. Since the Orange gene is epistatic it is impossible for a Red (or Cream or Tortie) to be totally clear of any tabby markings and often faint ticking can be seen on the body of a Red (or Cream) Burmese, this is because the vast majority of Burmese today are Ticked Tabby based and this base is revealed more readily in a red series cat. Breeders should where possible select for breeding from only Red cats that show minimal tabby markings (including ticking) and exhibiting the warmest brightest tangerine colouring. Many Red Burmese on the show bench tend to be rather pale and occasionally a little cold in tone. Breeders should look to improve the depth and clarity of the colour through careful selective breeding.

Photo: ??



Photo: ??

## Cream

A pale delicate Cream is highly desirable, although difficult to achieve, as stated above Cream is epistatic so it is impossible to clear tabby markings completely, but the ideal is a cat virtually clear of marks on the legs and chest and with only the “M” mark on the forehead; a distinct “bloom” should be visible on the head, ears and in the best examples, across the shoulders and even along the back and up the tail – such that the cat concerned looks as if it has been lightly dusted with talcum powder, and giving a cool matt tone to the delicate Cream colour. Cream Burmese are often too dark, and

sometimes rather a sandy colour, a number are too “hot” in tone and lack the “bloom” or powdering effect. Again careful selection when choosing Cream Burmese for breeding would help to improve this colour.



Photo Mark Henrie

### **Tortie Colours**

The action of the Burmese Colour Restriction gene seems to have the effect of breaking-up and mingling the tortie colours to a greater extent than is the case with full expression breeds such as the British or Persian, where the pattern often forms larger blocks or patches of a single colour. That said it is quite possible for patches, or solid blocks of either colour to occur in any of the Burmese Tortie varieties. Thus in the case of all four Tortie varieties the colours may be well mingled or blotched and blazes, solid legs or solid tails are all permissible. Wide variations in the overall effect of the Tortie coat pattern between cats are to be expected; please note that either colour may dominate and providing there is evidence of two colours a cat may be, for example, mainly red with small areas or brown or mainly blue with small areas of cream.

### ***Brown Tortie***

*Photo: Ian Jarvis*



*Photo: Penny Akehurst*



A mix of warm rich seal brown and varying shades of warm vibrant tangerine; these can range from pale tangerine to rich bright tangerine red.

### ***Blue Tortie***



Mix of soft warm medium blue grey and pale delicate cream, displaying a silvery sheen to rounded areas of the body.

***Chocolate Tortie***



Photo: Alan Robinson



Photo: ??

Mix of rich medium milk chocolate and shades of rich warm vibrant tangerine ranging from pale to rich bright tangerine red.

***Lilac Tortie***



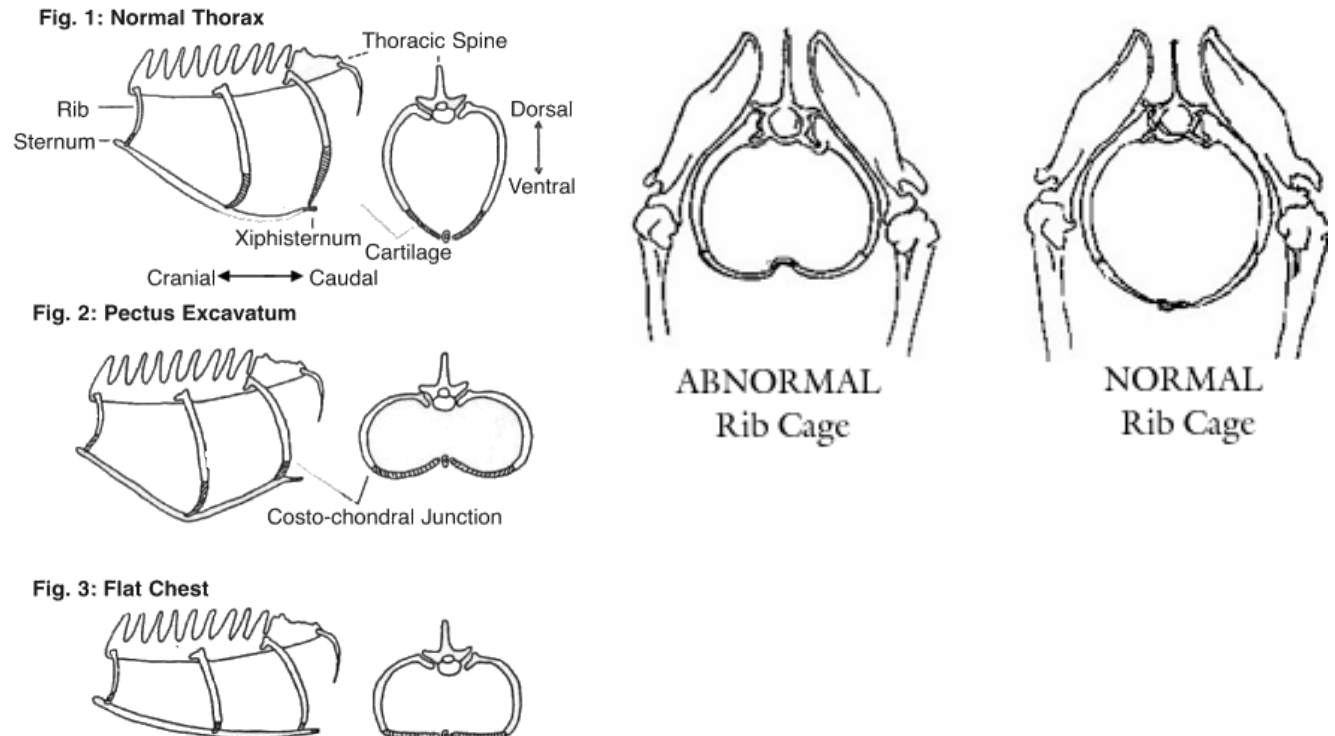
Photo: Alan Robinson

Mix of pale warm pinkish dove-grey and pale delicate cream; substantial areas of cream may display evidence of powdering or “bloom” giving a cool matt effect to the cream.

## Genetic Defects

**Hypokalaemic Polymyopathy** - a disorder which severely reduces potassium retention in the cat causing severe muscle weakness characterised by collapse of limbs and hanging of the head. The Burmese is known to suffer from this disorder. Believed to be a simple recessive gene it can “hide” for a number of generations and then appear, and in severe cases can contribute to early death. A blood sampling study is underway, but there is no general test available as yet. Any mating that produces a hypokalaemic kitten demonstrates that both parents are carriers of the recessive gene, a breeder should consider very carefully before using either cat for breeding in the future as there is a 50% chance that any kittens from a cat carrying hypokalaemia will inherit the gene.

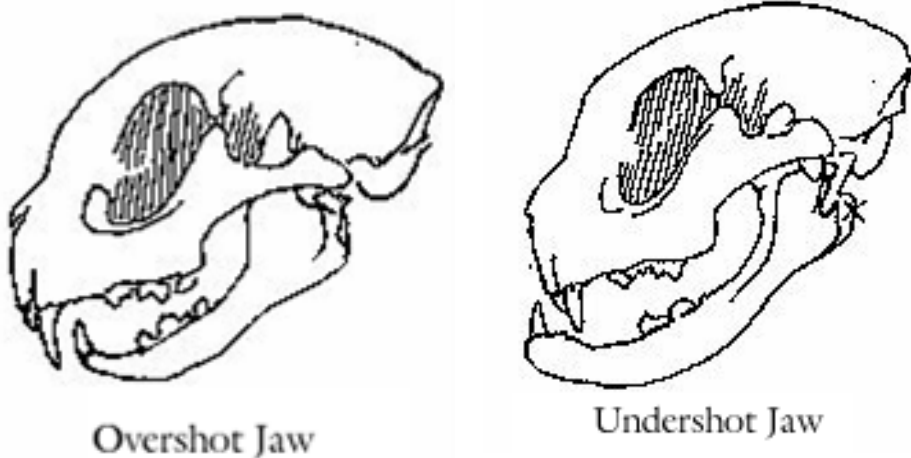
**Flat-chest syndrome** - there is good evidence that this is caused by a simple recessive gene, but it may also have a more complex genetic cause; the disorder results in a kitten with a compressed flattened rib-cage that has difficulty in breathing, etc. It can be fatal in a number of cases, depending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



**Orofacial Pain Syndrome (FOPS)** – the clinical signs are characterised by exaggerated licking and chewing movements, and pawing at the mouth. In kittens the problem resolves when teething does, but may reoccur when the cat is adult. The cause is unknown, but the condition shows similarities to trigeminal neuralgia in humans. The current hypothesis on the pathophysiology of FOPS involves damage or disturbance of the sensory endings of the trigeminal nerve resulting in sensitization, combined with a disorder of central processing of trigeminal information. As a very high percentage of the cats that present with symptoms are Burmese, this suggests a hereditary predisposition, this is further reinforced by the fact that many of the affected cats have been closely related, however the mode of inheritance has not yet been determined

### **Misaligned bites**

A fault that can become more exaggerated over generations if carefully considered breeding programmes are not followed. Most misaligned jaws in the Burmese are undershot, although overshot bites are not unknown, occasionally the lower jaw may be slightly off-set. Very careful consideration should be given before a Burmese with a misaligned bite is used for breeding, if there are sound reasons to proceed in breeding from a cat with a minor misalignment (excellent type, colour, coat), such a cat must be mated to a Burmese with a perfect bite; all resulting kittens should be checked carefully for any evidence of imperfections in the jaws.





**Umbilical Hernia/Inguinal Hernia** - a bulge or soft swelling at the navel (umbilicus) caused by protrusion of abdominal contents through the navel.

**Inguinal Hernia** - a bulge or soft swelling in the groin area caused by protrusion of abdominal contents through the inguinal canal. (This is less common and more difficult to detect than an umbilical hernia.)

**Unilateral Cryptorchid** - a male with two testicles; one descended into the scrotal sack, the other undescended.

**Cryptorchid** - a male with testicles which have not descended into the scrotal sack.

**Monorchid** - a male having only one testicle.

### **Feline Infectious Peritonitis (FIP)**

This is not an inherited disease, however, a genetic predisposition to the development of FIP was identified by Drs. Foley & Pedersen in 1996. It is likely a polygenetic trait rather than a simple dominant or recessive mode of inheritance. The likely defect in immunity to FIP is in cell-mediated immunity. Selection for overall disease resistance is a helpful tool for breeders.

### **Type 2 Diabetes**

Diabetes mellitus (DM) is a group of disorders characterised by high levels of sugar (glucose) in the blood. It can be caused by defects in insulin secretion, insulin action or

both. In the general population of cats (>85%) have type 2 DM; a disease characterised by inadequate insulin secretion and impaired insulin action. In UK the prevalence of DM in cats is increasing, from 1 in ~1000 cats in 1970 to 1 in ~100-200 cats now. Old age, obesity and being male all predispose cats to the development of DM. In the UK, (and Australia & New Zealand) DM is seen most frequently in Burmese cats (in 1 in ~50 cats). Risk factors for the development of DM in these Burmese cats include advancing age, chronic or recurring medical problems, dental disease, repeated corticosteroid treatment, confinement indoors, lower physical activity and greater body weight; male and female Burmese cats are equally likely to develop DM.

The exact cause of the disease in cats is not known, although it is generally accepted that genetic predisposition is a significant factor, in addition obesity, pancreatic disease, hormonal imbalances, and certain medications have all been incriminated as contributing factors.

*Steve Crow. February 2011*

## ***Annex 1***

### **List of foundation cats for the Burmese breed in the UK**

Wong Mau (Imported Burmese/Siamese hybrid)

Tangyi of Forbidden City (Imported Burmese/Siamese hybrid)

Chira Tan Tockseng (Imported Burmese/Siamese hybrid)

Ho Kik Mau (Br No. 24, Seal-point Siamese)

Tai Mau (24)

Te Ath (24)

Mingo of Yana (24)

Minkee of Chindwins (24)

Cummings Wee Sing (24)

Ch Ricki Tic (24)

Tai Tai of Tang Wong (24)

Chindwins His Wang Nu (24)

Miss Nora (24)

Southview Havoc (Br No. 32, Red-point Siamese)

Chevening Susy (unregistered Tortie & White)

S H Red Tabby (unregistered)

Cornish Treacle (Br No. 19, British Red Tabby)