ORIENTAL BREEDING POLICY

This breeding policy accompanies and supplements the Oriental Registration Policy and should be read in conjunction with that document.

The aim of this breeding policy is to give advice and guidance to ensure breeders observe what is considered "best practice" in breeding Orientals with the over-riding objective of improving the Oriental cat to meet all aspects of the Oriental Standard of Points, which describes the ideal for the recognised varieties in the Oriental Group.

The origins of the Oriental

Until the late 1960's very few Orientals were seen at shows other than the Havanas (which had their own classes), and the Lilacs and Whites which were exhibited as 'Any Other Variety (AOV)'. By the end of the decade the Havanas and the Tabby Pointed Siamese (only recognised as a variety of Siamese in 1966), were among the best Siamese types in the country. With the help of prudent outcrossing between Havanas and Tabby Point Siamese, and by backcrossing to both parental varieties, further improvement was made in the Havanas and the emergence of the Oriental Tabby as a beautiful variety in its own right was assured. Hot on the heels of the Oriental Tabbies came the Blues, Blacks, Tortoiseshells (Torties), Silver Tabbies, Smokes and Shaded Silvers.

The Oriental is now well established in the UK and over 50 years of breeding has developed and fixed good phenotype in the breed but with a decreasing gene-pool. The Oriental breed has one of the largest numbers of gene variations of any breed of pedigree cat recognised by GCCF. The combination of genes which affect colour, pattern and coat length makes it possible for a total of 816 permutations recognised in the Oriental Standard.

Having successfully "fixed" the type and specific appearance of the Oriental, breeders need to pay more regard to further improving other aspects of the breed such as colour, eye colour, coat and notably pattern.

Permitted Outcrosses:

It is important that no obstacle be put in the way of attempts to widen the gene pool except where there are cogent reasons not to allow the outcrossing.:

Since type is what distinguishes the Oriental from any other breed, outcrossing to breeds not of Siamese type is not permitted
In addition Foreign Whites, being blue eyed, may only be mated to Siamese and not to other colours of Oriental.

Genetic Make-up

As stated the Oriental Group holds a wide and varied group of both dominant and recessive genes; one cannot make sense of the Oriental breed without a basic understanding of the 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 Oriental the key genes influencing the colours, coat length and patterns within the breed are:

Full Colour [C] Siamese Colour Restriction [c]

A recessive semi albino mutation which causes the eyes to appear blue and the production of pigment in the hair to become temperature dependant. The pointed pattern occurs because the extremities are cooler than the body. The mutation causes all colours to be paler than in the corresponding self cat. Colour darkens with age, kittens are born white and gradually develop full

colour.
A DNA test for the Siamese gene is available.
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.

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 discernable. Other genes work to change this black pigment to other colours (see below).

Inhibitor (I) – a dominant gene that suppresses the development of pigment in the hair of the coat, typically producing hairs that are fully coloured only at the tip and have a white base. It has greater effect on the lighter pigment in an agouti cat removing the yellow colour and turning the base colour white or "silver". In the case of a non-agouti cat the inhibitor removes colour from the base of the hair-shaft to produce a silver (white) hair with a coloured tip, ie a Smoke. This allele appears to interact with other genes to produce various degrees of tipping, ranging from deeply tipped silver tabby to lightly tipped silver shaded tabby.

Tabby patterning 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 blotched (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 blotched; at the third locus there appears to be a modifying gene for either the classic or mackerel patterns resulting in the spotted tabby pattern. The patterns can be summarised as follows:

Mackerel (Mc) – the basic striped tabby pattern that overlays the agouti base (ie "wild" form)

Ticked (T) – 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.

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

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.

Wide-banding (Wb) – this has been hypothesized either as a gene (Robinson) or more probably a group of genes (Joan Wasselhuber, who coined the term "wide- banding genes"), increasing evidence for their existence has led to wide acceptance. Undercoat width genes determine the width of the undercoat whether or not the cat has a silver inhibitor gene. The term "undercoat" used here refers to 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 the undercoat widths in cats points to the polygenetic nature of wide-banding genes. If a single gene it is likely an incompletely dominant gene mutation, the effect serves to push the darker, pattern colour in the cat up away from the hair base towards the tip, turning the normal tabby patterns into a Shaded or Tipped cat. Precisely how the agouti, inhibitor and wide- banding genes interact on a molecular level is not clear- one possibility is the wide- banding genes influence the agouti protein production to remain high so that eumelanin pigment remains inhibited or down-regulated, another possibility is that
the wide-banding gene encodes for a second inhibitory protein that also down- regulates eumelanin.

Normal Hair [L] : Long-hair [l]
A recessive mutation which increases hair length. More subtle variations in length and texture are produced by the action of groups of polygenes. 4 independent mutations in the FGF5 (Feline Fibroblast Growth Factor 5) gene determine the long-haired phenotype. 3 of these seem to be breed specific, occurring in Norwegian Forest Cats, Main Coons and Ragdolls. The 4th is present

in all breeds of long haired cats including the oriental Longhair. It is possible that other mutations causing long hair may exist which have not yet been identified.
DNA tests are available for all 4 mutations.

Black [B] : Brown (Chocolate) [b] : Light Brown (Cinnamon) [bl]
The alleles of this gene alter the shape of the pigment granules deposited in hairs and in the nose and pad leather. Because differently shaped granules reflect light differently, the result is a changed colour. Chocolate appears to be incompletely dominant to cinnamon: Havanas carrying cinnamon are generally paler than pure Havanas. Oriental Blacks or Blues can carry either chocolate or cinnamon but not both. Oriental Lilacs can also carry cinnamon. However, if a Black carrying cinnamon is mated to a chocolate then chocolate carrying cinnamon will be produced and it would look as if the black carried chocolate.
DNA tests are available for both Chocolate and Cinnamon.

Orange (popularly Red) [O] : non-orange [o]
The Orange gene causes the pigment granules to become yellow. This makes the coat, paw pads and nose leather appear red in B series cats, cream in dilute cats and apricot where the DM gene is present. It does not matter which of the B series gene is present as the appearance is almost indistinguishable. A cat which would be black without the orange gene is called a black based red, similarly reds can also be chocolate or cinnamon based, and creams blue, lilac or fawn based.
Orange masks the effect of non-agouti: orange series cats always appear tabby. (Apparently clear coated reds are either ticked on careful inspection, or have been carefully selected for bad tabby pattern). All orange series with one or more tabby parents must be registered as tabby until proven otherwise. This used to mean using a number of test matings, but can now be proved by a DNA test.

Orange is a very unusual gene: its position is on the part of the X chromosome for which there is no counterpart in the Y. So in a male cat only one of the two alleles can be present: the cat either is orange series OY, or not oY. In a female there are three possibilities, the cat can be OO orange series, oo not orange series or Oo which gives rise to the Tortie. *A* peculiarity of the X chromosome is that only one is active in each cell, but the inactivation of the other happens quite late in the embryo's development, when there already very many cells, and each cell independently chooses which X to inactivate. In this case some of the pigment-producing cells O is active, in others o, giving the typical mottled appearance of the Tortoiseshell. Occasionally male Tortoiseshells appear, although they are usually sterile. They always represent a genetic anomaly. The most likely cause is the presence of three rather than two sex chromosomes (XXY Alternatively, there may be two pairs of sex chromosomes (XX and XY) with only one of the pair being present in each cell. The easiest way to understand how this could happen is development from a fusion of two fertilised eggs, but no doubt the truth is rather more complicated.

Dense Colour [D] : Dilution (popularly Blue) [d]
Dilution causes the pigment to be spread more thinly in the hair and this weakens the colour. It is independent of the colour genes above, so one can have black+dilution = blue, chocolate+dilution = lilac, cinnamon+dilution = fawn, or orange+dilution = cream. Cream can be blue, lilac or fawn based.
A DNA test is available.

Dilute Modifier [Dm] : normal [dm]
As its name suggests, the effect of the Dilute Modifier gene is to modify the effect of the Dilution gene d: it has no effect where the Dense gene D is present. It is unique among the colour genes seen in Orientals in that it is the dominant allele which has the effect: thus, it cannot be carried (but it can be masked, by the presence of D - i.e. in black, chocolate, cinnamon and red cats).). In dilute cats expressing any of the alleles of Black (i.e. blue, lilac or fawn) it produces caramel. Though each gives a distinct colour, for historical reasons all three are given just one colour name. In dilute cats together with orange, it produces apricot.
Unfortunately, the gene has not yet been identified, so there can be no DNA test)

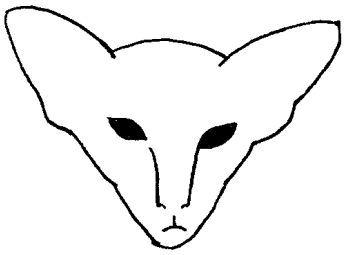
Polygenes – these are collections of genes which modify the effect of the main dominant and recessive genes above. A build up of polygenes creates a bigger effect, for example a collection of certain polygenes increases the length and density of the long-hair gene to create the Persian, a

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 Persian, British or Oriental Self. It is likely that a group of polygenes is the reason for variation in the degree of tipping in the Shaded the polygenes working to create the band-width in interactive with the inhibitor gene (when present) resulting in the range of pattern from tipped to heavily shaded.

The genetics involved in the ideal tabby, shaded or smoke cat is complex. Not only are there many interacting genes, but genes sometimes do not express themselves fully, or conflict with one another. For example, the melanin inhibitor sometimes does a poor job blocking pigment, resulting in an excessively gray undercoat, or in tarnishing. Likewise, poorly-expressed non-agouti or over-expression of melanin inhibitor will cause a pale, washed out black smoke. 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.

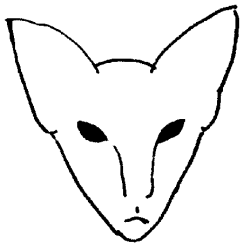
Type

When the Oriental breed was first established the decision was taken to adopt the Siamese type as the desired phenotype for the breed. Breeders have worked hard over the past twenty-five years to improve the type of Orientals to match the best examples of the Siamese breed. Continuing out-crossing to Siamese should be considered in order to maintain and expand the diversity of the Oriental gene-pool and to improve type where necessary



Balanced Head

Ear set too low



Ear set too upright

The head should be, neither round nor pointed, avoiding exaggerated type.

Correct Profile

Weak Chin and dip in profile

Very Weak Chin (overshot bite)

Very Strong Chin (undershot bite)

Coat

Regular out-crossing to Siamese has also improved coat length and texture, eliminating the overlong and somewhat thick coats of early Oriental shorthairs to produce the fine, relatively short, close-lying coat we see on the show bench today. However, breeders are encouraged to continue to pay close attention to coat texture since over-long and thicker coats still do appear. This is best done by mating to the best available cat with correct coat length/texture and avoiding matings to Oriental Longhairs or shorthair Orientals carrying the longhair gene – unless of course the main objective is specifically to improve the Oriental Longhair rather than a shorthair Oriental variety.

Eye Colour

Eye colour in most Orientals is green except in Foreign Whites and Oriental Pointed Bi-Colours where the eye colour is blue. In all Orientals orange and yellow eyes are incorrect.

Colour & Pattern

More work is necessary to improve aspects of colour and pattern in all Oriental varieties. It is recommended that breeders should have a clear aim in mind and pursue one objective at a time, while looking to avoid losing what has already been achieved; suggested best practice for each Oriental breed is outlined below:

Self

Breeders aspire to produce a Self Oriental with a solid even coat colour free from any evidence of ghost tabby markings and with colour which ideally would be sound in colour to the roots of the hairs.

For this reason best breeding practice would be to breed Self to Self. However, the relative lack of Self colours makes this impractical as a general rule; therefore, a mating to Siamese could be considered as the next best option. Mating to Ticked Standard Tabby might also be considered for good reasons eg. to improve colour or type. If this is done a Ticked Tabby with minimal legs barring should be selected where possible. Mating to any other tabby patterns is not recommended since this might introduce ghost markings to the self coloured progeny. Mating to a Shaded is not recommended as the introduction of wide-banding genes (or further build up the concentration of polygenes which enhance its effect) will accentuate the problem of unsoundness by pushing colour up from the roots to the tips of the hair-shaft.

Smoke

The Smoke has the appearance when in repose of being a Self coloured cat, but with a silver base to hairs giving the “smoke” effect when the cat moves and the silver base shows through areas of the top colour. The silver base is cause by the action of the Inhibitor gene working in conjunction with the non-agouti gene. The ideal Smoke has silver extending one-third of the way, and certainly no more than half-way, up the hair shaft from the root, and is clear of any ghost tabby markings.

The Inhibitor gene can be quite volatile in its expression and breeders should select for the correct amount of silver when mating two cats to ensure the desired “Smoke” effect in the offspring. Ideally mate Smoke to Smoke selecting for cats with correct amount of silver. At present there is a limited number of Smoke Orientals and so where this is not possible/desirable, mate to Self or Ticked Tabby and aim to
avoid reinforcing and building the effect of the wide-banding genes, as this will serve to push the top colour towards the hair tip and expose too much silver base; for this reason mating to medium and lightly Shaded cats should be avoided, although using a heavily shaded cat with minimal silver expression may be desirable.
A clear top colour is highly desirable, so avoid mating to other tabby patterns which will increase the likelihood of ghost tabby marking

Shaded

The Shaded is an agouti (tabby patterned) cat, the pattern originating from the Chinchilla, one of the foundation breeds. Virtually all Chinchillas are Classic Tabby based; it is the action of the inhibitor gene and wide-banding gene(s), coupled with a range of (other) polygenes which serves to push the pattern colour up the hair-shaft towards the tip, thus creating the Shaded effect. The best definition of a shaded pattern is one in which the hairs are tipped with colour and the overall appearance is of a cat without striping, slightly darker along the top midline and shading to untipped (white on a silver shaded, pale golden brown on a black non-silver) on the under- parts. The presence of the silver Inhibitor gene does not define a shaded cat, nor is it necessary for a shaded. The perfect shaded Oriental (shorthair or longhair) has black, brown, blue, etc, tipped hairs with the base colour extending no more than 1/3rd the way down from the tip, minimal or no barring on legs and tail, a well broken necklace, and non-tipped hairs on the underbelly and inside of the legs.

The ticked (see below) and shaded patterns are closely related, the pattern in both cases is defined by the overall appearance of the cat, not by the tipping of the hair. The hairs maybe tipped or multiply banded in both cases. Generally in the case of the Ticked Tabby the hair banding frequency is even, the banding frequency is short giving the hairs multiple bands, and/or the colour banding travels well down the hair shaft.

The genetics of the mackerel and classic patterns are relatively simple and, as stated above largely involve a single gene, Mc.

Shaded genetics are considerably more complicated, the pattern is composed of many genes working in concert. The minimal requirements to produce a shaded are the following attributes: agouti gene, silver inhibitor gene (in the case of a silver), the undercoat width gene(s) (wide-banding gene/genes) and a number of other polygenes that affect the number of bands of colour on each hair and acts in clearing up the residual striping on both the torso and extremities. Genetically the unpatterned cats carry either classic or mackerel “masked” by the unpatterned tabby pattern, in the case of the ticked tabby this is caused by the Ta (Abyssinian) gene which contrary to popular belief probably does not determine the banding frequency on the hairs (for example determine whether the hairs are “ticked” versus “tipped”), but rather determines whether there is striping on the main part of the body, the torso.

The unstriped tabby pattern of a Shaded appears to be genetically similar to or the same as the Abyssinian-type tabby (T), although whether they are identical is a matter of debate. If it is a different gene cause, it too appears to be incompletely dominant over both the mackerel and classic patterns in the same way as T. While this is a simplest view of unpatterned inheritance, the genetics of the shaded cat is more complex: a shaded is more than a homozygous unpatterned cat – it must have a wide undercoat width and proper banding of the hair so it appears tipped with colour.

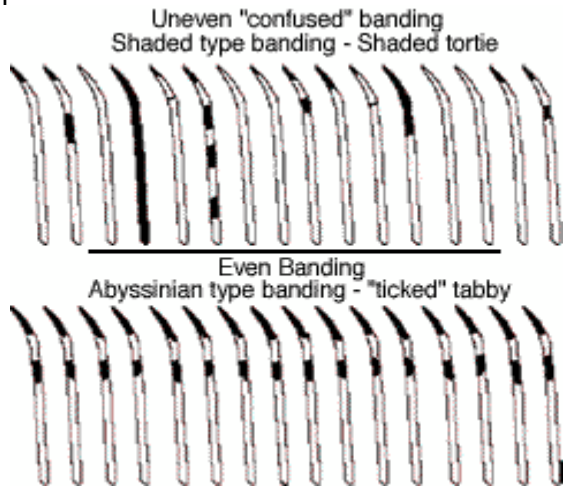
The homozygous unpatterned gene may be the most important attribute for removing striping, but other minor unpatterned genes are important in removing the residual striping and giving the final appearance of shaded. There are at least two attributes that are associated with the shading on the torso and main body of the Shaded,these genes have been named “Chaos” and “Confusion” (Carol Johnson). A third gene was proposed (Cathy Galfo) called “Erase” and appears to remove some of the residual barring on the extremities.

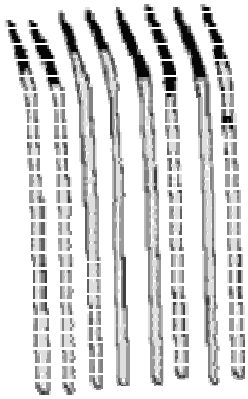
In a good shaded Oriental the tipping on the ends of the hair may appear on quick inspection to be even, but close inspection reveals that, like snowflakes, nearly every hair is different from each other – one has a short banded tip, the next may have 2 dark bands, the next may have a medium tip, and so on (see Fig 7 below). Thorough inspection reveals some hairs are even solid colours or non-tipped, this loss of co- ordination from hair to hair has been attributed to Confusion genes – this is in sharp contrast to Abyssinian type banding that tends to be very even. Chaos also disrupts the striped pattern and appears to be inherited independently of Confusion, it serves to eradicate residual striping that “breaks through” on the torso. In a Classic, Mackerel or Spotted tabby it is probably responsible for many cases of what is generally called “ticking” or “agouti

invasion" on the pattern. Residual striping on the extremities (necklace, legs bars and tail rings) may persist even in the presence of homozygous T, Chaos and Confusion. Other clean-up genes are necessary to remove the residual stripes and an Erase gene has be proposed as performing this function; Cathy Galfo's observations in her work with Shaded Orientals proposes that it appears to be inherited discretely to erase the residual markings.

Fig 7

Typical variation in Shaded hairs





A significant number of Shaded Oriental cats appearing on the show bench are exhibiting a noticeable amount of ticking (bands of colour) on hairs mixed in with shaded (tipped) hairs. This is undesirable and is leading to judges regularly questioning the registration of both Shaded and Ticked Tabby cats. It is highly necessary to address this growing problem through development of a breeding programme to improve the pattern. As shown above it is not possible to remove ticked hairs from among the tipped, but it is possible to select for the overall appearance of a Shaded pattern by working to achieve the appropriate combination of genes. This is why such attention is paid above to explaining in detail the supposed genetic basis of a good Shaded Oriental.

The Oriental SOP asks for the shaded pattern to be light to medium (but note that tipping so slight as to be barely discernible is undesirable); breeders should aim to avoid a heavily shaded pattern as the visibility of ticked hairs invading the shaded is greater when the shading in heavy.

To improve the quality of the Shaded pattern breeders should select for medium to light shading (ie a build-up of the wide-banding effect so that it is strongly expressed) and choose cats for breeding that appear (ie. visually look like) Shaded (all other things, such as good type and colour, being equal). The ideal mating is Shaded to Shaded (preferably using cats with as little visible ticking in their pattern as possible) with the aim of maximising the build up of positive polygenetic effect of Widebanding, Chaos and Confusion genes. Breeders should avoid matings to cat who have minimal expression of these genes. Alternatively mating to a Smoke, particularly one exhibiting too much silver for a good Smoke would be sensible.

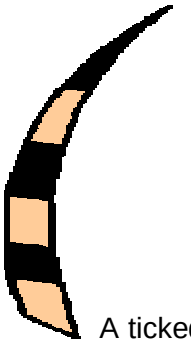
Ticked Tabby

A few Ticked Tabbies are beginning to suffer the invasion of shaded hairs mingled within the ticked, also there is work to do to eliminate the effects of wide- banding genes (and of the Chaos and Confusion genes), which reduce the number of bands of ticking on the hair shaft by pushing the pattern towards the hair tip, the causes of these two problems may well be interrelated. Breeders of Ticked Tabbies should address this by avoiding mating to Shaded, Smoke or noticeably poor quality Ticked Tabby Orientals. The ideal mating is Ticked Tabby to Ticked Tabby with the aim of increasing the banding towards the base of the hair shaft (Fig 8). Research has revealed the existence of a group of polygenes termed Banding Frequency genes – the agouti gene permits the hairs to have banded colours, but these other genes influence the number of

bands that actually occur on the hairs. At a molecular level banding frequency probably translates to the time interval in which an agouti protein turns on and off. Breeders should select to increase the build-up the effect of such genes.

Work could also usefully be undertaken to improve the richness of the base colour in some Ticked Tabbies, by selecting the best coloured cats for use in a breeding programme (thereby maximising the number of rufus ploygenes). Dilute colours have a more subtle pattern the clarity of which will be improved by maximising visibility through regular ticked to ticked matings, increasing the Banding Fequency genes, coupled with the removal of the wide-band gene.

Fig 8



A ticked patterned hair showing the desired multiple banding to be aimed for

There is evidence from other breeds eg. Egyptian Mau, that mating silver to standard increases the likelihood of tarnishing in silver and tends to produce standard tabbies with a cool, duller tone to the agouti base colour. Therefore the ideal mating for all Oriental tabby patterns is to mate silver to silver; standard to standard.

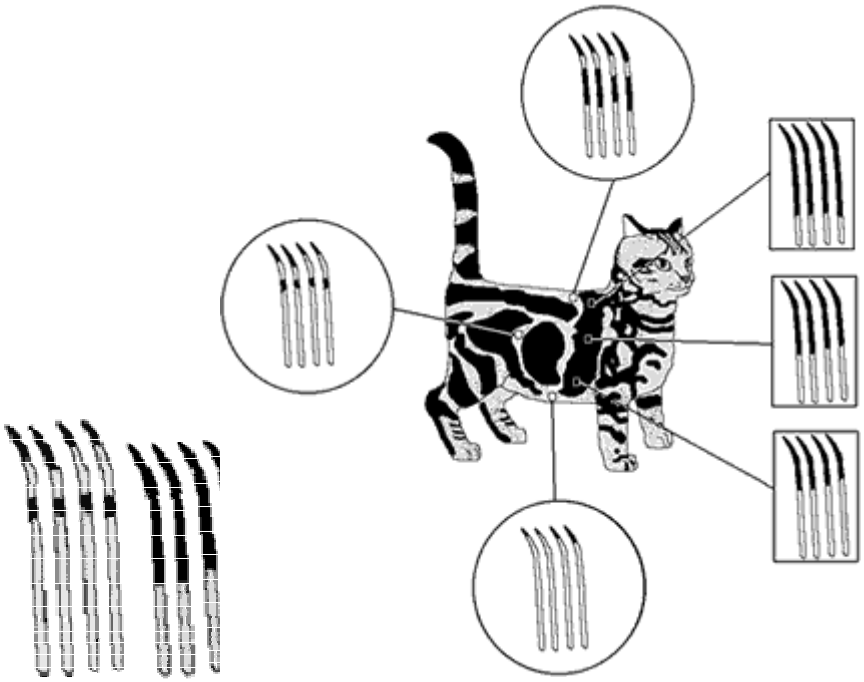
Spotted Tabby; Classic Tabby; Mackerel Tabby

For all other Tabby patterns breeders should where possible avoid mating Spotted, Classic or Mackerel Tabbies to Ticked Tabby or Shaded as this increases the likelihood of reducing the clarity and depth of the pattern, promotes agouti invasion of the pattern, making it less distinct, and will introduce or increase the effect of the widebanding genes. The aim must be to create a clearly defined pattern (see Figs 11, 12 & 13) with good contrast against a warm rich agouti base, or clear silver base in the case of silver tabbies, with no tarnishing. Therefore, the recommended ideal is to mate like to like (Classic to Classic, Spotted to Spotted, Mackerel to Mackerel), this presents difficulties currently because of the very small numbers, mating to Self Oriental or Siamese or another patterned tabby, is a better alternative than mating to a Ticked Tabby or Shaded.

Breeders should be pragmatic in the short-term and recognise the limitations of the gene pool exhibiting these patterns; it may be necessary to sacrifice some quality of type and/or coat texture in the short term in order to improve and fix the desired tabby pattern. Breeders should look to the long term objective in their breeding programme and seek to balance improving pattern and enhancing/maintaining good type.

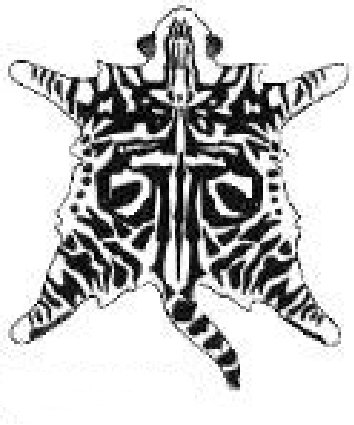
The drawing below (Fig 10) shows the desired clear pattern to be aimed for in breeding, in this case that of a Classic Tabby, as shows the variation in top colouration on hairs at different places on the body.

Fig 10



Agouti Pattern

Fig 11



CLASSIC TABBY

"M"; Lines over head; Butterfly; Parallel spine lines; Oysters; Markings symmetrical; Broken necklaces; Blotched, spotted or barred belly; Tail banded.

Fig 12

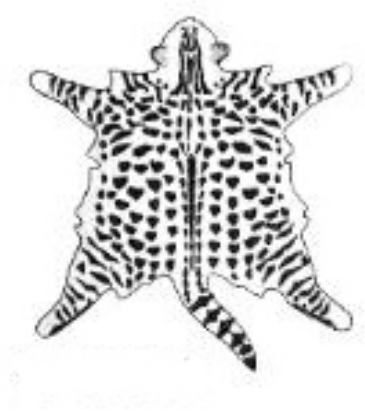
MACKEREL TABBY

Narrow unbroken line from head to base of tail with narrow broken line either side. Narrow vertical lines run down body.
Necklaces (may be broken); spotted or barred belly; leg bars; narrow tail rings.

Fig 13

Clearly defined spotting. Round and evenly distributed. Lines over head breaking on shoulders. Bars or spots on legs. Necklaces (may be broken); Belly spots. Complete or broken tail rings.

SPOTTED TABBY



There may be merit in giving consideration to the benefits of out-crossing to another recognised breed to improve pattern (eg Ocicat, Egyptian Mau), but breeders would then need to follow Oriental registration policy to achieve recognition as full Oriental in the 4th generation.

Oriental Longhair

The Oriental Longhair was pretty much ignored for the 1980s and only began to win some support from a few breeders from the 1990s onwards – the breed had suffered in the early years from the desire to eliminate the long-hair gene from the breeding programmes of other (shorthair) Oriental breeds. Much work has been undertaken since then and the breed has improved markedly in the past 15 years.

It must be realised that the OLH is simply a semi-longhaired version of its shorthaired sister breed, phenotype therefore should be identical, although the thickness of coat on the legs may make them appear less slender or elegant. The coat should be semi long and flowing with no woolly undercoat, it should lie flat to the body and have a silky texture. The length of coat is affected by age, getting longer as the cat matures, but more so length is affected by hormones, an entire cat particularly the males will have a far less profuse coat than their neutered counterparts.

Pattern is not so clear in the OLH as the OSH, as the length of coat tends to diffuse the pattern. But breeders should aim to improve pattern as in the shorthairs, but this is not easy as the gene pool is very limited.

OLH's may successfully be bred LH x LH over several generations without loss of type, breeding should be selective for the improvement of the individual, and out crossing to OSH, Siamese and Balinese is done to maintain good type but more to improve the gene pool which is extremely small.

Self, Smoke, Shaded and Ticked work best in Oriental Longhair; other Tabby patterns tend to be even more blurred and less distinct than the shorthair Oriental and therefore need a lot more work to clear and clarify the pattern.

Genetic Defects

http://www.fabcats.org/breeders/inherited_disorders/siamese.php
Breed predisposition/strongly suspected as inherited

Small intestinal adenocarcinoma

Intestinal adenocarcinoma accounts for approximately 20-35% of all intestinal tumours reported in cats. This type of tumour appears slightly more common in males (60% of cases), with older cats being at an increased risk (average reported age, 10.6 and 11.3 years). It has been demonstrated that Siamese cats are at an increased risk of suffering from intestinal adenocarcinoma, being 3-8 times more likely to suffer from this condition than DSH cats.

Urogenital conditions

Priapism (persistent and painful erection of the penis) (r) This is uncommon disorder has been seen most frequently in Siamese cats. In 1 report of 7 cases, 6 were in Siamese cats; in 4 of the cats the condition developed after attempted mating with an oestrus female, despite 3 of the cats having been castrated. Surgery to remove the penis may be needed to treat this condition.

Haematological/immunological conditions

Mast cell tumours (*) Mast cell tumours are reported to be the second most common cutaneous tumour in the cat (Miller and others, 1991). Two distinct forms of cutaneous mast cell tumours have been recognised in cats. The more common mastogenic mast cell tumour is histologically very similar to those mast cell tumours seen in dogs. The less frequently observed histiocytic mast cell tumour has similar morphological characteristics to histiocytic mast cells. Several studies have shown that Siamese cats appear to be predisposed to developing both types of mast cell tumour. In one study, Siamese cats had three times as many mast cell tumours as was expected statistically (Miller and others, 1991), although no sex predilection was noted. This finding differs with an earlier smaller study, which suggested that male cat had a predilection

for developing cutaneous mast cell tumours, particularly on the head and neck

Mediastinal / thymic lymphoma (*)Recent studies have shown that Siamese cats from all over the world are over-represented amongst cases of mediastinal (thymic / thoracic) lymphoma (lymphosarcoma). Affected cats are usually young (often less than 2 years old), FeLV negative, and they typically respond favourably to chemotherapy, with some cats gaining life-long remissions. Although the mode of inheritance has not been confirmed, it is suspected to be autosomal recessive in nature.Prof. Lesley Lyons of the UC Davis Feline Genome Project is happy to receive buccal swabs from affected cats for DNA testing as she is currently working on this problem: **http://www.vetmed.ucdavis.edu/PHR/LyonsDen**

AmyloidosisAmyloidosis is a diverse group of diseases that can be seen in many different species of animals and also in humans. Amyloid is a type of protein, and amyloidosis describes the disease that occurs when this particular protein is deposited within body organs. Different species or breeds may be affected differently, and in Siamese/Oriental cats deposition in the liver occurs primarily, resulting in liver dysfunction and haemorrhage from the liver. Young cats (approx, 8 months – 7 years), are most commonly affected Spontaneous rupture of the liver has been described with sudden death or acute signs associated with intra-abdominal haemorrhage. Affected cats are often related but the mode of inheritance and contribution of environmental factors is unknown.

Hereditary porphyria (r) This condition is caused by an enzyme deficiency resulting in elevated porphyrins in the blood, viscera, teeth, bones and excreta, which causes a pink discoloration teeth and bones . A severe macrocytic hypochromic anaemia, hepatomegaly, splenomegaly, and uraemia may occur.Giddens WE, Labbe RF, Swango LJ, Padgett GA (1975) Feline congenital erythropoietic porphyria associated with severe anemia and renal disease: clinical, morphologic, and biochemical studies, *American Journal of Pathology* 80:367-386Glenn BL, Glenn HG, Omtvedt IT (1968) Congenital porphyria in the domestic cat (Felis catus): preliminary investigations on inheritance pattern. American Journal of Veterinary Research 29 (8) 1653-7ADJ Watson (1990) Feline precursor porphyria, characterized by persistent delta aminolevulinic aciduria. Journal of Small Animal Practice 31 (8): 393-7Rimington C, Moore MR (1985) Porphyria in animals. Clinical Dermatology 3 (2): 144-55

Bleeding disorders; Haemophilia B

Neurological conditions – Genetics confirmed and/or test available

Lysosomal Storage Diseases – typically presenting with ataxia (uncoordinated walking)**:****-Gangliosidosis GM1 (r)**Gangliosidosis GM1 is an autosomal recessively inherited lysosomal storage disease (see under general section and Korat). The condition is due to a lack of the enzyme acid β galactosidase which leads to a build up of GM1 ganglioside within cells, particularly of the nervous system, as gangliosides are required for formation of neuronal cell membranes.

Mucopolysaccharidosis VI (r) Mucopolysaccharidosis VI is a lysosomal storage disease (see general section) with an autosomal recessive mode of inheritance. It is one of the most commonly identified lysosomal storage disorders and is due to deficiency of the enzyme arylsulphatase B. This leads to an accumulation of dermatan sulphate within numerous cells of the body, including liver, skin, muscle, bone marrow and white blood cells. Clinical signs include reduced growth rate, and skeletal deformity. The face appears flattened, with widely spaced eyes and small ears. The corneas (usually clear areas at the front of the eyes) appear cloudy. Signs are usually evident from 6-8 weeks, with the skeletal deformities giving rise to a crouching gait. Joints may be painful to manipulate, and compression of the spinal cord can lead to hindlimb weakness or paralysis. Bony changes progress up to about 9 months of age then may stabilise. Diagnosis may be based on radiographic changes to the bones, granules and vacuoles in peripheral white blood cells and a positive toludine blue ‘spot’ test that detects dermatan sulphate in urine. 2 different mutations have been identified by means of a PCR based mutation analysis of DNA samples. Mutation L476P has been identified in cats from Italy and North America, and is associated with a severe form of the disease. Mutation D520N appears more widespread and causes a milder form of the disease, but

some cats may possess both mutations, therefore there may be a range of clinical signs with this disease. A study into the prevalence of these mutations failed to identify either mutation in Siamese cats from the UK, and only the D520N mutation was present in cats from Ireland, but this was only based on 17 cats. □□

Niemann Pick Disease Type A (r)□Niemann Pick disease is a lysosomal storage disease (see general section) also known as **sphingomyelinosis**. It is an autosomal recessive hereditary disease due to lack of the enzyme sphingomyelinase, which results in the accumulation of sphingomyelin within cells of the nervous system and organs such as liver, spleen, kidneys, lung and intestines. Clinical signs are apparent from 3 months of age and include ataxia (uncoordinasted walking), hypermetria (high stepping walk), head tremors, loss of balance and splayed legs. Some cats show stereotypic chewing, and the liver and spleen may be palpably enlarged. Progressive paralysis develops, with most cats dying before 1 year of age. Diagnosis relies on demonstrating the enzyme deficiency in tissues such as liver, brain or skin fibroblasts.□A milder variant form of Niemann Pick disease has also been seen in Siamese cats. This may be the same condition that has been reported as **neurovisceral sphingomyelinosis**. This was a single case report of a cat with neural and visceral accumulation of sphingomyelin. It presented at 6 months of age with ataxia (uncoordinated walking) and head tremor. The mode of inheritance was unknown, but a sibling had died of similar signs.□□

BAC recommendation

Oriental breeders with particular interest in the Oriental breed are encouraged to work closely with other like-minded breeders to devise and implement planned breeding programmes to realise shared objectives to maintain and progress the Oriental breed. The Oriental BAC will provide advice and will do everything it can to promote and support such breeding programmes.