**WHAT IS POLYDACTYL:**

In the scientific literature, the term polydactyly (poly meaning many and dactyl referring to digits) is often used to refer to extra digits.

There are 2 forms of polydactyly; pre-axial and post-axial. Axial refers to the folding of the embryonic limb. The "thumb" side is before the axis (pre-axial) and the "little finger" side is post-axial. In humans it is usually post axial i.e. an extra little finger, whereas in cats it is normally pre-axial with the extra toe on the thumb side of the foot.

The form of polydactyly most often seen in cats is the result of a simple autosomal dominant trait. It does not appear to affect the cat adversely and is not known to be associated with other anomalies.
**See Reference Footnote: [1] (Polydactyly and Related Traits - Dr. Solveig Pflueger, Fall 1998)**
**CLICK -> http://polystandard.polytrak.net/acceptance/1-Pflueger_Traits.pdf**

**HISTORY:**

When the breed was first accepted in cat associations the decision to exclude the Maine Coon poly was not due to health issues. It was aesthetics. The image of polydactyly was seen as a close reference to the domestic or barn cat. It was intended to introduce the trait at a later date, once the Maine Coon Breed was established. This visible trait was only bred out to fit show standards.
During its inception, the MCBFA included the Polydactyl Standard. It states: *Our MCBFA Polydactyl Standard has been voted in by our membership, and the wording is as follows: "The Maine Coon Polydactyl Cat should conform to the Standard of the Maine Coon Cat, with the exception that multiple toes are allowed on either fore or hind paws or both."* **See Reference Footnote: [2] (Scratch Sheet spring 1970)**
**CLICK -> http://polystandard.polytrak.net/acceptance/2-Scratch_Sheet.pdf**

In a letter dated September 29th 1973 the then Vice-President of the MCBFA Mr. Ljostad says: *"We knew that many Maine Coon cats were polydactyl and did not want this trait to get entirely lost from the breed. Then we heard that some of the breeders who had these cats were no longer able to breed them. So my wife and I decided we had better get one and keep this trait going in the breed."*
**See Reference Footnote: [3] (Letter dated September 29th 1973 of the then Vice-President of the MCBFA Mr. Ljostad.)**
**CLICK -> http://polystandard.polytrak.net/acceptance/3-Ljostad_Letter.pdf**

A cat FAQ on the MCBFA website refers to why the Maine Coon polydactyl was culled from the breed as it was a disqualification in competition. **See URL (Breed FAQ's)**
**CLICK -> http://www.fanciers.com/breed-faqs/maine-coon-faq.html**

Over the course of time a few Maine Coon breeders kept the trait alive in their breeding programs. During 2001 to 2004 these breeders started to organize, and realized there were breeders Worldwide that had been doing the same. In 2005 there was a concentrated effort to start reintroducing the trait again to the show ring. The Maine Coon polydactyls were entered into the New Traits division to start the education of the trait and to start gaining exposure.

As the Maine Coon polydactyl was seen as a pet the breed standard type faltered. The breeders started a concentrated effort to tighten up the standard on the Maine Coon polys. This will indeed take time but from 2005 to present day the type has greatly improved.

Also there was an additional awareness. In 2006 a database litter tracking system was developed. PolyTrak. **See URL (Poly Data Listings) CLICK -> http://www.polytrak.net** Data is being collected from litters Worldwide that have Maine Coon polydactyls as parents. Each litter documents sire, dam, kittens, sex, colour, date of birth, digit description, still born, cat association registry, country location and breeder comments. Data tracking also includes a search/sort of gender, poly – non poly, digits left or right front, left or right rear, number of paws that are polydactyl or name.

**GENETICS:**

Much has been said over the years about the misstatement that polydactylism is a breeding defect that will produce extreme expressions and severe maladies to a Maine Coon. Nothing could be further from the truth as born out by Scientific Studies and general observations for decades.

In 1947 The Danforth Studies of a largely in-bred population from two DLH Dams produced 254 poly kittens which were observed and logged: "The trait is not related to sex, and no evidence is found that its gene is lethal" He did not find evidence of split foot or radial hypoplasia (also called radial hemimelia) in his studies. **See URL (Polydactyl Cats – Part 1 Copyright 2001-2009) CLICK -> http://www.messybeast.com/poly-cats.html**

Dr. Leslie Lyons, University of California, Davis has worked with Maine Coon breeders for years, collecting DNA samples to identify the polydactyl gene. Her determination coupled with other studies states the following: ***the Pd gene is absolutely harmless even when homozygous and has nothing in common with Rh gene***. **See Reference Footnote: [4] (Dr. Lyons in Moscow) CLICK -> http://polystandard.polytrak.net/acceptance/4-DrLyons_Moscow.pdf**

As well these Maine Coon polydactyl DNA samples have been used in an in depth study of polydactylism in the feline world conducted in 2007 by Laura A. Lettice, Alison E. Hill, Paul S. Devenney and Robert E. Hill from the MRC-Human Genetics Unit, Western General Hospital in Edinburgh U. K. studied. This was an attempt to expand on the current known genes that produce polydactyl expression in various species including humans, mice and cats. The feline study identified 3 variants of the Pd Gene, although similar, had slightly different expressions. This brought the total to 13, the number of identified genetic expressions of polydactylism, 3 of which were specifically associated with cats only. Although noted in the study, that polydactylism can be a problem in other species, no noted problems were found in the feline world. This study included Pedigreed Maine Coons, as well as Pedigreed PixieBobs and British Cats. The 3 variants are all benign expressions of the Pd gene. The study concluded that: "Analysis of polydactylous cats identified three new mutations associated with preaxial polydactyly. As found for human and mouse (8), the cat mutations reside within the ZRS suggesting that the nature of preaxial polydactyly in cats is equivalent to other mammals. Since these mutations produce a limb-specific phenotype in human with no other discernible physiological defects, we submit that this type of polydactyly has no further detrimental affect on the cat's health". (Source; Human Molecular Genetics, 2008, Vol. 17, No. 7 doi:10.1093/hmg/ddm370 Advance Access published on December 21, 2007). The quote is just a small portion of the findings, but the full report and conclusions can be read from the source. **See Reference Footnote: [5] (Human Molecular Genetics, 2008, Vol. 17, No. 7 978–985) CLICK -> http://polystandard.polytrak.net/acceptance/5-Molecular_Genetics.pdf**

In 2006 PolyTrak was established to further look into the expressions of polydactylism in the Maine Coon Breed. Although not Scientific from the standpoint of controlled breeding and observations in a sterile lab, the PolyTrak studies have involved a much larger number of pedigreed Maine Coon kittens and adults over the past 9 years from "real-world" settings. These observations and studies are continuing to this day to compare the Scientific studies with observations from Catteries and pet-homes throughout the World. With over a 1000 Maine Coons, no noted detrimental effects from a genetic standpoint have been observed... thus lending credence to the above noted Scientific studies and observations. **See URL (PolyTrak Website - Litter & Breeder Tracking) Click ->: http://www.polytrak.net**

Information concerning breeding with the Maine Coon polydactyl should be accessed from experienced Maine Coon breeders that have had the polydactyls in their programs for a number of years. They have documented matings that include poly x non poly, poly x poly and homozygous poly x non-poly. Documentation from the breeders show there is no effects with a poly x poly mating. It is suggested to do a poly x non-poly mating to track the genetics of the parents to know which one the polydactyl gene came from and in which form. To get a poly you need a poly. On average with the listings with PolyTrak to date, we are showing that 55.7% of kittens born are polydactyl. Individual litters produce individual results and this percentage is averaged over many litters.

Breeders have reported no poly kittens in litters, one, two, three…,etc. It is a roll of the dice and can be compared to the male/female percentage, you have a 50-50 chance with each kitten. When you have a poly x poly mating it is estimated you will have 75% poly kittens in a litter. If one parent is a homozygous poly then the litter will be 100% polydactyl.

The fact that remains is the gene is variable in expression regardless of breeding combinations. It is not lethal or even different in expression in its homozygous form, as is the case in some other expressions of a dominant gene. **See Reference Footnote:[5] (Dr. Lyons Speaks before the WCC in Arnhem, The Netherlands) CLICK -> http://polystandard.polytrak.net/acceptance/7-DrLyons_Arnhem.pdf.**

Because the polydactyl gene can be expressed in different ways, a digit description has been devised for clarity on thumbs, toes and dewclaws. **See Reference Footnote:[6] (Guide to Digit Identification and Paw Photo Examples) CLICK -> http://polystandard.polytrak.net/acceptance/6-Digit_Guide.pdf**

## ADVANCEMENT TO CHAMPIONSHIP STATUS:

The Maine Coon polydactyl has been fully accepted as part of the Maine Coon breed and has equal status for show purposes in the New Zealand Cat Fancy (the first WCC member organization to do so). Maine Coon polys are generally accepted for registration as a Maine Coon throughout many Cat Associations around the World, including TICA. The few that do not accept the Maine Coon polydactyl as part of the MC Breed are now beginning to revisit that stance. The F.C.C.Q, recently made such a change and discussions are on-going in other Associations. TICA, as a genetics based Registry and with "member-driven" policies, has made provisions for the introduction of a non-harmful trait and "genetically valid trait" into a Breed Standard. This is done primarily through an "Advanced New Traits" division, where the trait can be observed and the cat judged as a Maine Coon in a "show ring" setting, so that all may see the expression and how a cat compares to its other pedigreed counterparts. This display and judging has been going on throughout the World since September of 2005. Again no noted problems or genetic expressions that would preclude its full acceptance.

There is a concern that accepting Maine Coon polydactyls in the show ring would encourage extreme breeding practices. This could be a valid concern from the standpoint that extreme (and sometimes harmful) traits are bred for showing purposes in the name of a perfect or better show quality cats. Due to the different nature of the Pd gene in Maine Coons from other dominant traits, this is likely not possible. Mother Nature has built in a limit of 9 or 10 digits just due to the physical limitations and space on the limb bud. Although documented Maine Coons have never exceeded 8 digits (Source: www.polytrak.net), if a way were found to breed cats with excessive number of digits, the limit would soon be reached due to physical restraints. Further, as a protection against this remote possibility, TICA, recognizing polydactyly as a valid trait, any polydactyl variant of an established breed showing in Championship status, would be limited to a maximum of 7 digits per paw. **See URL (TICA – Standing Rules) CLICK -> http://www.tica.org** The Pixie Bob Breed has placed a maximum of 7 digits for show purposes and the Maine Coon would do likewise. So, the advancement to Championship Status for the Maine Coon polydactyl would require a change to the breed standard: “Polydactyl allowed, maximum 7 digits per paw”. This at present encompasses over 99% of the sampled kittens born in the last few years.

## REFERENCED FOOTNOTES:

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**[1] Polydactyly and Related Traits - Dr. Solveig Pflueger, Fall 1998**
**CLICK -> http://polystandard.polytrak.net/acceptance/1-Pflueger_Traits.pdf**

**[2] Scratch Sheet spring 1970**
**CLICK -> http://polystandard.polytrak.net/acceptance/2-Scratch_Sheet.pdf**

**[3] Letter dated September 29th 1973 of the then Vice-President of the MCBFA Mr.Ljostad**
**CLICK -> http://polystandard.polytrak.net/acceptance/3-Ljostad_Letter.pdf**

[4] **Dr. Lyons in Moscow (PolyTrak Newsletter Vol.3-No.4)**
**CLICK -> http://polystandard.polytrak.net/acceptence/4-DrLyons_Moscow.pdf**
**See URL (Interview with Don Shaw in March 1976)**
**CLICK -> http://polystandard.polytrak.net/acceptance/X-Don_Shaw_Interview.pdf**
**See URL (PolyTrak xls Spreadsheet showing a line trace of one polydactyl Foundation – Gray Luv Perry)**
**CLICK -> http://polystandard.polytrak.net/acceptance/X-Heritage.xls**
**See URL (Excellent Article by Susan Grindell from New Zealand on polydactylism)**
**CLICK -> http://polystandard.polytrak.net/acceptance/X-Suzan_Article.pdf**

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[6] **Guide to Digit Identification and Paw Photo Examples**
**CLICK -> http://polystandard.polytrak.net/acceptance/6-Digit_Guide.pdf**

[7] **Dr. Lyons Speaks before the WCC in Arnhem, The Netherlands**
**CLICK -> http://polystandard.polytrak.net/acceptance/7-DrLyons_Arnhem.pdf.**

## Other Referenced Links:

**See URL (Poly Data Listings) CLICK -> http://www.polytrak.net**
**See URL (Breed FAQ's) CLICK -> http://www.fanciers.com/breed-faqs/maine-coon-faq.html**
**See URL (Kitten Listings - Sorted) CLICK -> http://www.polytrak.net/database/search/selectsort.php**
**See URL (Polydactyl Cats – Part 1 ©2001-2009) CLICK -> http://www.messybeast.com/poly-cats.html**
**See URL (TICA – Standing Rules) CLICK -> http://www.tica.org**
**See URL (Maine Coon Breederrs and Fancier Association) CLICK -> http://www.mcbfa.org**
**See URL (Polytrak & UC, Davis collecting DNA ) CLICK -> http://www.polytrak.net/msc/dr_lyons_dna.htm**