## Nomenclature and etymology

The word *cat* derives from [Old English](http://en.wikipedia.org/wiki/Old_English) *catt*, which belongs to a group of related words in [European languages](http://en.wikipedia.org/wiki/Languages_of_Europe), including Welsh *cath*, Spanish *gato*, causing them to be pejoratively known as 'coons' by their political opponents French *chat* (French pronunciation: [[ʃa]](http://en.wikipedia.org/wiki/Wikipedia:IPA_for_French)),[[12]](http://en.wikipedia.org/wiki/Cat#cite_note-11) Basque *katu*, [Byzantine Greek](http://en.wikipedia.org/wiki/Byzantine_Greek) *κάτια* *kátia*, [Old Irish](http://en.wikipedia.org/wiki/Old_Irish)*cat*, [Frisian](http://en.wikipedia.org/wiki/Frisian_languages) and Dutch *kat*, German *Katze*, [Lithuanian](http://en.wikipedia.org/wiki/Lithuanian_language) *katė*, [Finnish](http://en.wikipedia.org/wiki/Finnish_language) *Kissa*, [Armenian](http://en.wikipedia.org/wiki/Armenian_language) [*katu*](http://en.wiktionary.org/wiki/%D5%AF%D5%A1%D5%BF%D5%B8%D6%82), and [Old Church Slavonic](http://en.wikipedia.org/wiki/Old_Church_Slavonic) *kotka*. The ultimate source of all these terms is [Late Latin](http://en.wikipedia.org/wiki/Late_Latin) *catus, cattus, catta* "domestic cat", as opposed to *feles*'European wildcat'. It is unclear whether the Greek or the Latin came first, but, like [Arabic](http://en.wikipedia.org/wiki/Arabic_language) *qiṭṭ* and [Nubian](http://en.wikipedia.org/wiki/Nobiin_language) *kàdíís*, they were undoubtedly borrowed from a word in an [Afro-Asiatic](http://en.wikipedia.org/wiki/Afro-Asiatic_languages) language akin to [Berber](http://en.wikipedia.org/wiki/Berber_languages) *kaddîska*, meaning 'wildcat'.[[13]](http://en.wikipedia.org/wiki/Cat#cite_note-12) The term *puss* (as in pussycat) may come from [Dutch](http://en.wikipedia.org/wiki/Dutch_language) *poes* or from [Low German](http://en.wikipedia.org/wiki/Low_German) *Puuskatte*, dialectal [Swedish](http://en.wikipedia.org/wiki/Swedish_language) *kattepus*, or [Norwegian](http://en.wikipedia.org/wiki/Norwegian_language) *pus*, *pusekatt*, all of which primarily denote a woman and, by extension, a female cat.[[14]](http://en.wikipedia.org/wiki/Cat#cite_note-13) Though previously thought to be solitary, there is now evidence that raccoons engage in gender-specific [social behavior](https://en.wikipedia.org/wiki/Social_behavior). Related females often share a common area, while unrelated males live together in groups of up to four animals to maintain their positions against foreign males during the mating season, and other potential invaders. [Home range](https://en.wikipedia.org/wiki/Home_range) sizes vary anywhere from 3 hectares (7.4 acres) for females in cities to 5,000 hectares (12,000 acres) for males in [prairies](https://en.wikipedia.org/wiki/Prairie).

While wildcats are the ancestral species from which domestic cats are descended, there are several intermediate stages between domestic pet and pedigree cats and these entirely wild cats. The semi-feral cat is a cat that is not owned by any one individual, but is generally friendly to people and may be fed by several households.[Feral cats](http://en.wikipedia.org/wiki/Feral_cat) are associated with human habitations and may be fed by people or forage in rubbish, but are wary of human interaction. Pseudo-wildcats are descended from domestic cats, but now tend to live entirely independently from people.[[15]](http://en.wikipedia.org/wiki/Cat#cite_note-Bradshaw1999-14)

Classification based on human interaction[[15]](http://en.wikipedia.org/wiki/Cat#cite_note-Bradshaw1999-14)

A group of cats is referred to as a "clowder", a male cat is called a "tom" (or a "gib", if neutered), and a female is called a "molly" or "queen". The male progenitor of a cat, especially a pedigreed cat, is its "sire", and its female progenitor is its "dam". An immature cat is called a "[kitten](http://en.wikipedia.org/wiki/Kitten)" (which is also an alternative name for young rats, rabbits, [hedgehogs](http://en.wikipedia.org/wiki/Hedgehog), [beavers](http://en.wikipedia.org/wiki/Beaver), [squirrels](http://en.wikipedia.org/wiki/Squirrel) and [skunks](http://en.wikipedia.org/wiki/Skunk)). In [medieval Britain](http://en.wikipedia.org/wiki/England_in_the_Middle_Ages), the word *kitten* was interchangeable with the word *catling*.

A cat whose [ancestry](http://en.wikipedia.org/wiki/Genealogy) is formally registered is called a [pedigreed cat](http://en.wikipedia.org/wiki/Pedigree_(cat)), [purebred cat](http://en.wikipedia.org/wiki/Purebred_cat), or a [show cat](http://en.wikipedia.org/wiki/Show_cat). In strict terms, a pure-bred cat is one whose ancestry contains only individuals of the same breed. A pedigreed cat is one whose ancestry is recorded, but may have ancestors of different breeds. Cats of unrecorded mixed ancestry are referred to as [domestic longhairs](http://en.wikipedia.org/wiki/Domestic_longhair_cat) and [domestic shorthairs](http://en.wikipedia.org/wiki/Domestic_shorthair_cat) or commonly as random-bred, moggies, mongrels, or mutt-cats.

## Taxonomy and evolution

*Main article:*[*Cat evolution*](http://en.wikipedia.org/wiki/Cat_gap#Cat_evolution)

[](http://en.wikipedia.org/wiki/File:AfricanWildCat.jpg)

[magnify-clip](http://en.wikipedia.org/wiki/File:AfricanWildCat.jpg)

The wildcat [*Felis silvestris*](http://en.wikipedia.org/wiki/Wildcat) is a close relative and possible ancestor of the domestic cat.

The Felids are a rapidly evolving family of mammals that share a common ancestor only 10–15 million years ago,[[16]](http://en.wikipedia.org/wiki/Cat#cite_note-15) and include, in addition to the domestic cat, lions, tigers, cougars, and many others. Within this family, domestic cats (*Felis catus*) are part of the [genus](http://en.wikipedia.org/wiki/Genus) [*Felis*](http://en.wikipedia.org/wiki/Felis), which is a group of small cats containing seven species.[[1]](http://en.wikipedia.org/wiki/Cat#cite_note-msw3-0)[[17]](http://en.wikipedia.org/wiki/Cat#cite_note-16) Members of the genus are found worldwide and include the [Jungle Cat](http://en.wikipedia.org/wiki/Jungle_Cat) (*Felis chaus*) of southeast Asia, the [African Wildcat](http://en.wikipedia.org/wiki/African_Wildcat) (*Felis silvestris lybica*), the [Chinese Mountain Cat](http://en.wikipedia.org/wiki/Chinese_Mountain_Cat) (*Felis bieti*) and the Arabian [Sand Cat](http://en.wikipedia.org/wiki/Sand_Cat) (*Felis margarita*).[[18]](http://en.wikipedia.org/wiki/Cat#cite_note-17) Similarly, [Spanish colonists](https://en.wikipedia.org/wiki/Spanish_colonization_of_the_Americas) adopted the Spanish word *mapache* from the [Nahuatl](https://en.wikipedia.org/wiki/Nahuatl) *mapachitli* of the [Aztecs](https://en.wikipedia.org/wiki/Aztec), meaning "[the] one who takes everything in its hands".[[12]](https://en.wikipedia.org/wiki/Raccoon#cite_note-holmgren52-12) In many languages, the raccoon is named for its characteristic dousing behavior in conjunction with that language's term for *bear*, for example *Waschbär* in German, *orsetto lavatore* in Italian, *mosómedve* in [Hungarian](https://en.wikipedia.org/wiki/Hungarian_language) and *araiguma* (アライグマ) in Japanese. In French and European Portuguese, the washing behavior is combined with these languages' term for *rat*, yielding, respectively, *raton laveur* and *ratão-lavadeiro*

All the cats in this genus share a common ancestor that probably lived around 6–7 million years ago in Asia.[[19]](http://en.wikipedia.org/wiki/Cat#cite_note-Johnson-18) Although the exact relationships within the Felidae are still uncertain,[[20]](http://en.wikipedia.org/wiki/Cat#cite_note-Mattern-19)[[21]](http://en.wikipedia.org/wiki/Cat#cite_note-20) both the Chinese Mountain Cat and the African Wildcat are close relations of the domestic cat and are both classed as [subspecies](http://en.wikipedia.org/wiki/Subspecies) of the [Wildcat](http://en.wikipedia.org/wiki/Wildcat) *Felis silvestris*.[[4]](http://en.wikipedia.org/wiki/Cat#cite_note-Driscoll-3)[[20]](http://en.wikipedia.org/wiki/Cat#cite_note-Mattern-19) As domestic cats are little altered from wildcats, they can readily interbreed. This [hybridization](http://en.wikipedia.org/wiki/Hybrid_(biology)) may pose a danger to the genetic distinctiveness of wildcat populations, particularly in [Scotland](http://en.wikipedia.org/wiki/Scotland) and [Hungary](http://en.wikipedia.org/wiki/Hungary).[[22]](http://en.wikipedia.org/wiki/Cat#cite_note-21).[[27]](http://en.wikipedia.org/wiki/Cat#cite_note-26)

Cats have either a [mutualistic](http://en.wikipedia.org/wiki/Mutualism_(biology)) or [commensal](http://en.wikipedia.org/wiki/Commensalism) relationship with humans. However, in comparison to [dogs](http://en.wikipedia.org/wiki/Dog), cats have not undergone major changes during the domestication process, as the form and behavior of the domestic cat are not radically different from those of wildcats, and domestic cats are perfectly capable of surviving in the wild.[[28]](http://en.wikipedia.org/wiki/Cat#cite_note-Lipinski-27)[[29]](http://en.wikipedia.org/wiki/Cat#cite_note-CameronBeaumont-28) This limited evolution during domestication means that domestic cats tend to interbreed freely with feral cats, which distinguishes them from other domesticated animals.[[15]](http://en.wikipedia.org/wiki/Cat#cite_note-Bradshaw1999-14) However, several natural behaviors and characteristics of wildcats may have [preadapted](http://en.wikipedia.org/wiki/Preadaptation) them for domestication as pets.[[29]](http://en.wikipedia.org/wiki/Cat#cite_note-CameronBeaumont-28) These traits include their small size, social nature, obvious body language, love of play and relatively high intelligence;[[30]](http://en.wikipedia.org/wiki/Cat#cite_note-29) they may also have an inborn tendency towards tameness.[[29]](http://en.wikipedia.org/wiki/Cat#cite_note-CameronBeaumont-28)

There are two main theories about how cats were domesticated. In one, people deliberately tamed cats in a process of [artificial selection](http://en.wikipedia.org/wiki/Artificial_selection), as they were useful predators of vermin.[[31]](http://en.wikipedia.org/wiki/Cat#cite_note-OConnor-30) However, this has been criticized as implausible, because there may have been little reward for such an effort: cats generally do not carry out commands and, although they do eat rodents, other species such as [ferrets](http://en.wikipedia.org/wiki/Ferret) or [terriers](http://en.wikipedia.org/wiki/Terrier) may be better at controlling these pests.[[4]](http://en.wikipedia.org/wiki/Cat#cite_note-Driscoll-3) The alternative idea is that cats were simply tolerated by people and gradually diverged from their 'wild' relatives through [natural selection](http://en.wikipedia.org/wiki/Natural_selection), as they adapted to hunting the vermin found around humans in towns and villages.[[4]](http://en.wikipedia.org/wiki/Cat#cite_note-Driscoll-3)

The domestic cat was first classified as *Felis catus* by [Carolus Linnaeus](http://en.wikipedia.org/wiki/Carolus_Linnaeus) in the tenth edition of his [*Systema Naturae*](http://en.wikipedia.org/wiki/Systema_Naturae) of 1758.[[2]](http://en.wikipedia.org/wiki/Cat#cite_note-Linaeus1758-1)[[23]](http://en.wikipedia.org/wiki/Cat#cite_note-MSW3-catus-22) However, because of modern [phylogenetics](http://en.wikipedia.org/wiki/Phylogenetics), domestic cats are now usually regarded as another subspecies of the Wildcat *Felis silvestris*.[[4]](http://en.wikipedia.org/wiki/Cat#cite_note-Driscoll-3)[[23]](http://en.wikipedia.org/wiki/Cat#cite_note-MSW3-catus-22)[[24]](http://en.wikipedia.org/wiki/Cat#cite_note-MSW3-silvestris-23) This has resulted in mixed usage of the terms, as the domestic cat can be called by its subspecies name, *Felis silvestris catus*.[[1]](http://en.wikipedia.org/wiki/Cat#cite_note-msw3-0)[[4]](http://en.wikipedia.org/wiki/Cat#cite_note-Driscoll-3) Wildcats have also been referred to as various subspecies of *F. catus*,[[24]](http://en.wikipedia.org/wiki/Cat#cite_note-MSW3-silvestris-23) but in 2003 the [International Commission on Zoological Nomenclature](http://en.wikipedia.org/wiki/International_Commission_on_Zoological_Nomenclature) fixed the name for wildcats as *F. silvestris*.[[25]](http://en.wikipedia.org/wiki/Cat#cite_note-ICZN-24) The most common name in use for the domestic cat remains *F. catus*, following a [convention](http://en.wikipedia.org/wiki/Convention_(norm)) for domesticated animals of using the earliest (the senior) [synonym](http://en.wikipedia.org/wiki/Synonym_(taxonomy)) proposed.[[25]](http://en.wikipedia.org/wiki/Cat#cite_note-ICZN-24)Sometimes the domestic cat is called *Felis domesticus*[[26]](http://en.wikipedia.org/wiki/Cat#cite_note-MacDonald-25) or *Felis domestica*,[[23]](http://en.wikipedia.org/wiki/Cat#cite_note-MSW3-catus-22) the term coined by German naturalist [Johann Christian Polycarp Erxleben](http://en.wikipedia.org/wiki/Johann_Christian_Polycarp_Erxleben) in 1777. These are not valid taxonomic names, and Linnaeus' binomial takes precedence

## Genetics

*Main article:*[*Cat genetics*](http://en.wikipedia.org/wiki/Cat_genetics)

[](http://en.wikipedia.org/wiki/File:WhiteCat.jpg)

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Blue-eyed cats with white fur have a high incidence of [genetic deafness](http://en.wikipedia.org/wiki/Deaf_white_cat).[[32]](http://en.wikipedia.org/wiki/Cat#cite_note-Strain-31)

The domesticated cat and its closest wild ancestor are both [diploid](http://en.wikipedia.org/wiki/Diploid) organisms that possess 38 [chromosomes](http://en.wikipedia.org/wiki/Chromosome)[[33]](http://en.wikipedia.org/wiki/Cat#cite_note-32) and roughly 20,000 genes.[[34]](http://en.wikipedia.org/wiki/Cat#cite_note-pmid17975172-33) About 250 heritable [genetic disorders](http://en.wikipedia.org/wiki/Genetic_disorder) have been identified in cats, many similar to human [inborn errors](http://en.wikipedia.org/wiki/Inborn_error_of_metabolism).[[35]](http://en.wikipedia.org/wiki/Cat#cite_note-O.27Brien-34) The high level of similarity among the [metabolisms](http://en.wikipedia.org/wiki/Metabolism) of mammals allows many of these feline diseases to be diagnosed using [genetic tests](http://en.wikipedia.org/wiki/Genetic_testing)that were originally developed for use in humans, as well as the use of cats in the study of the human diseases.[[36]](http://en.wikipedia.org/wiki/Cat#cite_note-35)[[37]](http://en.wikipedia.org/wiki/Cat#cite_note-OBrien-36)

An example of a [mutation](http://en.wikipedia.org/wiki/Mutation) that is shared among all felines, including the big cats, is a mutant [chemosensor](http://en.wikipedia.org/wiki/Chemosensor) in their [taste buds](http://en.wikipedia.org/wiki/Taste_bud) that prevents them from tasting sweetness, which may explain their indifference to fruits, berries, and other sugary foods.[[38]](http://en.wikipedia.org/wiki/Cat#cite_note-sugar-37) In some breeds of cats [congenital deafness](http://en.wikipedia.org/wiki/Congenital_deafness) is very common, with most [white cats](http://en.wikipedia.org/wiki/Deaf_white_cat) (but not [albinos](http://en.wikipedia.org/wiki/Albino)) being affected, particularly if they also have blue eyes.[[32]](http://en.wikipedia.org/wiki/Cat#cite_note-Strain-31) The genes responsible for this defect are unknown, but the disease is studied in the hope that it may shed light on the causes of hereditary deafness in humans.[[39]](http://en.wikipedia.org/wiki/Cat#cite_note-38)

Since a large variety of coat patterns exist within the various cat breeds, the cat is an excellent animal to study the [coat genetics](http://en.wikipedia.org/wiki/Cat_coat_genetics) of hair growth and coloration.[[40]](http://en.wikipedia.org/wiki/Cat#cite_note-39) Several [genes](http://en.wikipedia.org/wiki/Gene) interact to produce cats' hair color and coat patterns. Different combinations of these genes give different [phenotypes](http://en.wikipedia.org/wiki/Phenotype). For example, the [enzyme](http://en.wikipedia.org/wiki/Enzyme) [tyrosinase](http://en.wikipedia.org/wiki/Tyrosinase) is needed to produce the dark pigment [melanin](http://en.wikipedia.org/wiki/Melanin) and [Burmese cats](http://en.wikipedia.org/wiki/Burmese_cats) have a mutant form that is only active at low temperatures, resulting in color appearing only on the cooler ears, tail and paws.[[41]](http://en.wikipedia.org/wiki/Cat#cite_note-40) A completely inactive gene for tyrosinase is found in albino cats, which therefore lack all pigment.[[42]](http://en.wikipedia.org/wiki/Cat#cite_note-41) Hair length is determined by the gene for [fibroblast growth factor 5](http://en.wikipedia.org/wiki/FGF5), with inactive copies of this gene causing long hair.[[43]](http://en.wikipedia.org/wiki/Cat#cite_note-42)

[](http://en.wikipedia.org/wiki/File:Ojo_de_gata_trim.jpg)

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Purebreds normally have amber eyes, while nonpedigrees are more likely to have green eyes

The Cat Genome Project, sponsored by the Laboratory of Genomic Diversity at the U.S. [National Cancer Institute](http://en.wikipedia.org/wiki/National_Cancer_Institute) Frederick Cancer Research and Development Center in [Frederick](http://en.wikipedia.org/wiki/Frederick,_Maryland), Maryland, aims to help the development of the cat as an [animal model](http://en.wikipedia.org/wiki/Animal_model) for human hereditary and [infectious diseases](http://en.wikipedia.org/wiki/Infectious_disease), as well as contributing to the understanding of the evolution of mammals.[[37]](http://en.wikipedia.org/wiki/Cat#cite_note-OBrien-36) This effort led to the publication in 2007 of an initial draft of the genome of an [Abyssinian](http://en.wikipedia.org/wiki/Abyssinian_(cat)) cat called Cinnamon.[[34]](http://en.wikipedia.org/wiki/Cat#cite_note-pmid17975172-33) The existence of a draft genome has led to the discovery of several cat disease genes,[[34]](http://en.wikipedia.org/wiki/Cat#cite_note-pmid17975172-33) and even allowed the development of cat [genetic fingerprinting](http://en.wikipedia.org/wiki/Genetic_fingerprinting) for use in [forensics](http://en.wikipedia.org/wiki/Forensics).[[44]](http://en.wikipedia.org/wiki/Cat#cite_note-43)

## Anatomy

[](http://en.wikipedia.org/wiki/File:Scheme_cat_anatomy-en.svg)

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Diagram of the general [anatomy](http://en.wikipedia.org/wiki/Anatomy) of a male

Domestic cats are similar in size to the other members of the genus *Felis*, typically weighing between 4 kilograms (8 lb 13 oz) and 5 kilograms (11 lb 0 oz).[[20]](http://en.wikipedia.org/wiki/Cat#cite_note-Mattern-19) However, some [breeds](http://en.wikipedia.org/wiki/Cat_breed), such as the [Maine Coon](http://en.wikipedia.org/wiki/Maine_Coon), can exceed 11 kilograms (25 lb). Conversely, very small cats (less than 1.8 kilograms (3 lb 15 oz)) have been reported.[[45]](http://en.wikipedia.org/wiki/Cat#cite_note-44) The world record for the largest cat is 21.297 kilograms (46 lb 15.2 oz).[[46]](http://en.wikipedia.org/wiki/Cat#cite_note-45) The smallest adult cat ever officially recorded weighed around 1.36 kilograms (3 lb).[[47]](http://en.wikipedia.org/wiki/Cat#cite_note-46) Cats average about 23–25 centimeters (9–10 in) in height and 46 centimeters (18.1 in) in head/body length (males being larger than females), with tails averaging 30 centimeters (11.8 in) in length.[[48]](http://en.wikipedia.org/wiki/Cat#cite_note-47)

Cats have 7 [cervical vertebrae](http://en.wikipedia.org/wiki/Cervical_vertebrae) like almost all [mammals](http://en.wikipedia.org/wiki/Mammals), 13 [thoracic vertebrae](http://en.wikipedia.org/wiki/Thoracic_vertebrae) (humans have 12), 7 [lumbar vertebrae](http://en.wikipedia.org/wiki/Lumbar_vertebrae) (humans have 5), 3 [sacral vertebrae](http://en.wikipedia.org/wiki/Sacrum) like most mammals (humans have 5 because of their bipedal posture), and a variable number of [caudal vertebrae](http://en.wikipedia.org/wiki/Caudal_vertebrae) in the tail (humans retain 3 to 5 caudal vertebrae, fused into an internal [coccyx](http://en.wikipedia.org/wiki/Coccyx)).[[49]](http://en.wikipedia.org/wiki/Cat#cite_note-48) The extra lumbar and thoracic vertebrae account for the cat's spinal mobility and flexibility. Attached to the spine are 13 ribs, the shoulder, and the [pelvis](http://en.wikipedia.org/wiki/Pelvis).[[50]](http://en.wikipedia.org/wiki/Cat#cite_note-49) Unlike human arms, cat forelimbs are attached to the shoulder by free-floating [clavicle bones](http://en.wikipedia.org/wiki/Clavicle), which allow them to pass their body through any space into which they can fit their heads.[[51]](http://en.wikipedia.org/wiki/Cat#cite_note-50)

[](http://en.wikipedia.org/wiki/File:Cat_skull.jpg)

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Skull

The cat skull is unusual among mammals in having very large [eye sockets](http://en.wikipedia.org/wiki/Eye_socket) and a powerful and specialized jaw.[[52]](http://en.wikipedia.org/wiki/Cat#cite_note-Case-51) Within the jaw, cats have teeth adapted for killing prey and tearing meat. When it overpowers its prey, a cat delivers a lethal neck bite with its two long [canine teeth](http://en.wikipedia.org/wiki/Canine_tooth), inserting them between two of the prey's vertebrae and severing its [spinal cord](http://en.wikipedia.org/wiki/Spinal_cord), causing irreversible [paralysis](http://en.wikipedia.org/wiki/Paralysis) and death.[[53]](http://en.wikipedia.org/wiki/Cat#cite_note-Smith1992-52) Compared to other felines, domestic cats have narrowly spaced canine teeth; which is an adaptation to their preferred prey of small rodents, which have small vertebrae.[[53]](http://en.wikipedia.org/wiki/Cat#cite_note-Smith1992-52) The [premolar](http://en.wikipedia.org/wiki/Premolar)and [first molar](http://en.wikipedia.org/wiki/Molar_(tooth)) together compose the [carnassial](http://en.wikipedia.org/wiki/Carnassial) pair on each side of the mouth, which efficiently shears meat into small pieces, like a pair of [scissors](http://en.wikipedia.org/wiki/Scissors). These are vital in feeding, since cats' small[molars](http://en.wikipedia.org/wiki/Molar_(tooth)) cannot chew food effectively.[[54]](http://en.wikipedia.org/wiki/Cat#cite_note-53)

Cats, like dogs, are [digitigrades](http://en.wikipedia.org/wiki/Digitigrade). They walk directly on their toes, with the bones of their feet making up the lower part of the visible leg.[[55]](http://en.wikipedia.org/wiki/Cat#cite_note-54) Cats are capable of walking very precisely, because like all[felines](http://en.wikipedia.org/wiki/Felinae) they directly register; that is, they place each hind paw (almost) directly in the print of the corresponding forepaw, minimizing noise and visible tracks. This also provides sure footing for their hind paws when they navigate rough terrain. Unlike most mammals, when cats walk, they use a "pacing" [gait](http://en.wikipedia.org/wiki/Gait); that is, they move the two legs on one side of the body before the legs on the other side. This trait is shared with [camels](http://en.wikipedia.org/wiki/Camel) and [giraffes](http://en.wikipedia.org/wiki/Giraffe). As a walk speeds up into a trot, a cat's gait will change to be a "diagonal" gait, similar to other mammals: the diagonally opposite hind and forelegs will move simultaneously.[[56]](http://en.wikipedia.org/wiki/Cat#cite_note-55)

Like almost all members of the [Felidae](http://en.wikipedia.org/wiki/Felidae) [family](http://en.wikipedia.org/wiki/Family_(biology)), cats have protractable [claws](http://en.wikipedia.org/wiki/Claw).[[57]](http://en.wikipedia.org/wiki/Cat#cite_note-56) In their normal, relaxed position the claws are sheathed with the [skin](http://en.wikipedia.org/wiki/Skin) and [fur](http://en.wikipedia.org/wiki/Fur) around the [toe pads](http://en.wikipedia.org/wiki/Paw). This keeps the claws sharp by preventing wear from contact with the ground and allows the silent stalking of prey. The claws on the forefeet are typically sharper than those on the hind feet.[[58]](http://en.wikipedia.org/wiki/Cat#cite_note-57) Cats can voluntarily extend their claws on one or more paws. They may extend their claws in hunting or self-defense, climbing, "[kneading](http://en.wikipedia.org/wiki/Kneading_(cats))", or for extra traction on soft surfaces. Most cats have five claws on their front paws, and four on their rear paws.[[59]](http://en.wikipedia.org/wiki/Cat#cite_note-Danforth1947-58) The fifth front claw (the [dewclaw](http://en.wikipedia.org/wiki/Dewclaw)) is [proximal](http://en.wikipedia.org/wiki/Proximal) to the other claws. More proximally, there is a protrusion which appears to be a sixth "finger". This special feature of the front paws, on the inside of the wrists, is the carpal pad, also found on the paws of [big cats](http://en.wikipedia.org/wiki/Big_cat) and dogs. It has no function in normal walking, but is thought to be an anti-skidding device used while jumping. Some breeds of cats are prone to [polydactylyism](http://en.wikipedia.org/wiki/Polydactyl_cat), and may have eight or even ten toes.[[59]](http://en.wikipedia.org/wiki/Cat#cite_note-Danforth1947-58) These are particularly common along the North-East coast of North America.[[60]](http://en.wikipedia.org/wiki/Cat#cite_note-59)

## Physiology

|  |  |
| --- | --- |
| **Normal physiological values**[[61]](http://en.wikipedia.org/wiki/Cat#cite_note-60) | |
| [Body temperature](http://en.wikipedia.org/wiki/Body_temperature) | 38.6 °C (101.5 °F) |
| [Heart rate](http://en.wikipedia.org/wiki/Heart_rate) | 120–140 beats per minute |
| [Breathing rate](http://en.wikipedia.org/wiki/Breathing_rate) | 16–40 breaths per minute |

As cats are familiar and easily kept animals, their physiology has been particularly well studied; it generally resembles that of other carnivorous mammals but displays several unusual features probably attributable to cats' descent from desert-dwelling species.[[26]](http://en.wikipedia.org/wiki/Cat#cite_note-MacDonald-25) For instance, cats are able to tolerate quite high temperatures: humans generally start to feel uncomfortable when their skin temperature passes about 44.5 °C (112 °F), but cats show no discomfort until their skin reaches around 52 °C (126 °F),[[62]](http://en.wikipedia.org/wiki/Cat#cite_note-61) and can tolerate temperatures of up to 56 °C (133 °F) if they have access to water.[[63]](http://en.wikipedia.org/wiki/Cat#cite_note-62)

Cats conserve heat by reducing the flow of blood to their skin and lose heat by evaporation through their mouth. They do not sweat, and pant only at very high temperatures.[[64]](http://en.wikipedia.org/wiki/Cat#cite_note-63) Unusually, a cat's body temperature does not vary throughout the day; this is part of cats' general lack of [circadian rhythms](http://en.wikipedia.org/wiki/Circadian_rhythm) and may reflect their tendency to be active both during the day and at night.[[65]](http://en.wikipedia.org/wiki/Cat#cite_note-64)Cats' feces are usually dry and their urine is also highly concentrated, both of which are adaptations that allow cats to retain as much fluid as possible.[[26]](http://en.wikipedia.org/wiki/Cat#cite_note-MacDonald-25) Their kidneys are so efficient that cats can survive on a diet consisting only of meat, with no additional water,[[66]](http://en.wikipedia.org/wiki/Cat#cite_note-65) and can even rehydrate by drinking [seawater](http://en.wikipedia.org/wiki/Seawater).[[67]](http://en.wikipedia.org/wiki/Cat#cite_note-66)[[68]](http://en.wikipedia.org/wiki/Cat#cite_note-67)

Cats are [obligate carnivores](http://en.wikipedia.org/wiki/Obligate_carnivores): their [physiology](http://en.wikipedia.org/wiki/Physiology) has evolved to efficiently process meat, and they have difficulty digesting plant matter.[[26]](http://en.wikipedia.org/wiki/Cat#cite_note-MacDonald-25) In contrast to [omnivores](http://en.wikipedia.org/wiki/Omnivore) such as [rats](http://en.wikipedia.org/wiki/Rat), which only require about 4% protein in their diet, about 20% of a cat's diet must be protein.[[26]](http://en.wikipedia.org/wiki/Cat#cite_note-MacDonald-25) Cats are unusually dependent on a constant supply of the [amino acid](http://en.wikipedia.org/wiki/Amino_acid) [arginine](http://en.wikipedia.org/wiki/Arginine), and a diet lacking arginine causes marked weight loss and can be rapidly fatal.[[69]](http://en.wikipedia.org/wiki/Cat#cite_note-68) Another unusual feature is that the cat also cannot produce the amino acid [taurine](http://en.wikipedia.org/wiki/Taurine), with taurine deficiency causing [macular degeneration](http://en.wikipedia.org/wiki/Macular_degeneration), where the cat's retina slowly degenerates, causing irreversible blindness.[[26]](http://en.wikipedia.org/wiki/Cat#cite_note-MacDonald-25) Since cats tend to eat all of their prey, they obtain minerals by digesting animal bones, and a diet composed only of meat may cause [calcium](http://en.wikipedia.org/wiki/Calcium) deficiency.[[26]](http://en.wikipedia.org/wiki/Cat#cite_note-MacDonald-25)

A cat's [digestive tract](http://en.wikipedia.org/wiki/Gastrointestinal_tract) is also adapted to meat eating, being much shorter than that of omnivores and having low levels of several of the [digestive enzymes](http://en.wikipedia.org/wiki/Digestive_enzyme) that are needed to digest carbohydrates.[[70]](http://en.wikipedia.org/wiki/Cat#cite_note-Zoran-69) These traits severely limit the cat's ability to digest and use plant-derived nutrients, as well as certain [fatty acids](http://en.wikipedia.org/wiki/Fatty_acid).[[70]](http://en.wikipedia.org/wiki/Cat#cite_note-Zoran-69) Despite the cat's meat-oriented physiology, several vegetarian or vegan cat foods have been marketed that are supplemented with [chemically synthesized](http://en.wikipedia.org/wiki/Chemical_synthesis) taurine and other nutrients, in attempts to produce a complete diet. However, some of these products still fail to provide all the nutrients that cats require,[[71]](http://en.wikipedia.org/wiki/Cat#cite_note-70) and diets containing no animal products pose the risk of causing severe nutritional deficiencies.[[72]](http://en.wikipedia.org/wiki/Cat#cite_note-Zaghini-71)

## Senses