

Domestication of the Cat

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INTRODUCTION

Cats were not the first species domesticated by humans and will certainly not be the last, but as of 1986 cats have surpassed dogs in total numbers of companion household animals in the United States becoming the most popular.^{1, 2} So what does domestication of the cat mean, and how was this accomplished?

Domestication is the breeding and containment of a large group of animals under the control of humans and involves the geographic reproductive and behavioral isolation of this group from the wild population.^{1, 2} The primary difference between domestication and taming is that taming refers simply to the decrease of a fear response to humans in an individual animal, whereas with domestication, the lessening of the fear response transfers from generation to generation.¹

So, what characteristics does a species have to possess to become domesticated? They need to be easily socialized to humans, have potential for enhanced reproduction, be able to transform their social structure and have skills or characteristics desirable to humans.^{1, 3} Species that have these characteristics can become domesticated.

Taxonomy

Domestic cats are classified as members of the Felidae family. This family consists of several genera, including *Felis*, *Lynx*, *Panthera* and *Acinocyx*. The *Felis* genus is composed of 26 species of cats, including the domestic cat (*Felis catus*).¹ The domestic cat is believed to have descended from the African wild cat (*Felis silvestris lybica*). There are other *F. silvestris* species and smaller wild cats that may have contributed to the gene pool over time, but geographic distribution, behavioral, historical archeological evidence suggests that the African wildcat was the first tamed and then gradually domesticated to become the modern domestic cat.¹

Both *F. catus* and *F. silvestris* have 19 pairs of chromosomes, which when combined total 38 chromosomes. This indicates that *F. catus* and *F. silvestris* are still capable of interbreeding and producing offspring.¹ Breeding that includes mating domestic cats with wild cats as seen with the Savanna cat (a domestic cat crossed with the Africa Serval) and the Bengal (a domestic cat crossed with an Asian Leopard cat). Not all of these offspring are fertile in the first generations and aggression can be problematic with these breeds.⁴ When identifying a species, animal behaviorists indicate the likelihood that certain groups of animals would naturally interbreed, although this may be limited by geographical isolation, differences in social behavior and incongruity of their reproductive cycles.⁶

The oldest known bony remains of African wildcats, which date back to 6,000-7,000 years B.C., were excavated from Jericho and Cyprus, coinciding with the earliest human settlements.^{1, 2} The oldest evidence of domestic cats in human settlements was found in the Egyptian tombs, which date from roughly 4,000 years B.C., and the earliest pictorial evidence that shows cats in a close relationship with humans dates from 1,600-1,500 years B.C.¹ The primary difficulty in determining the length of

domestication of cats is that there aren't that many physical differences between wild and domestic cats, in addition wild cats have been attracted to human habitations even before efforts were made to domesticate them.^{1, 5} It appears that the African wildcat had some type of relationship with man as early as 9,000 years ago, whereas the domestic cat as we know it has been in existence for roughly 3,000-5,000 years.¹

THE PROCESS OF DOMESTICATION

Easily socialized to man

Compared with the wildcat, the domestic cat is more juvenile in appearance (neoteny). These changes can be seen in the smaller overall size of the domestic cat, the increased variety of coat colors, hair length and hair type as well as eye color which can range from yellow to gold, green and blue.¹ Domestic cats retain more juvenile behaviors, resulting in increased attention seeking even into adulthood and tolerance of increased population density. This increase in juvenile behaviors results in the domestic cats having an enhanced tolerance of and need for affiliation with others compared to the wildcat. When animals are socialized to human caretakers, a strong and enduring bond of attachment and affection results; this relationship is referred to as the human-animal bond.¹ Despite the fact that domestic cats lack the ability to communicate with humans through language, they have become very skilled at manipulating their caretakers to satisfy their basic needs: food, shelter and, of course, a little affection.⁶

Enhanced reproductive potential

The female wildcat has only one estrous cycle per year, which occurs in January or February. This limits the wildcat to only one litter of kittens each year. The modern domestic cats have multiple estrous cycles throughout the year, making them seasonally polyestrous. This also makes them capable of producing 2-3 litters each year, depending on how long the kittens remain with the queen after weaning. Unfortunately, this increase in reproductive potential has been a major contributor to the serious overpopulation problem among stray and feral cat populations in the United States.¹

Transformation of their social structure

Behaviors that join an individual to a group, such as care soliciting, mutual grooming and playing, can be seen in young wildcats but are infrequent to completely absent in adults.¹ Care soliciting includes head butting, rubbing against an owner's legs and vocalization; these behaviors indicate the cat is seeking attention more than affection. Once a wildcat has reached puberty, the family unit breaks up and each cat lives a relatively solitary life as an adult, individual wildcats interact with each other only during territorial disputes and mating.¹

Domestic cats continue to seek out petting and affection into adulthood and often remain quite playful. They can develop strong and enduring emotional bonds with humans, other cats and even other species within their environments.¹ Undoubtedly, these behaviors have been responsible for the current popularity of cats as a companion animal.¹

Desirable characteristics

Cats may have been initially domesticated for several reasons, including their hunting ability, their association with the spirit world (i.e. they were considered deities in Egyptian religions) or a combination of both.¹ Most likely, the large number of mice and rats found around Egyptian granaries probably first attracted the African wildcat to human settlements. Because the wildcats controlled the rodent populations, their presence was probably tolerated or even encouraged.¹ For the queens, the barns provided shelter for their kittens, and a steady supply of food.

Interestingly, it is known that both the black and brown rats, as well as the common house mouse, all originated in Asia and only spread to Northern Europe during the Middle Ages. Domestic cats did not appear in northern Europe until the Middle Ages, apparently following on the heels of their favorite prey.¹

The ancient Egyptians were interested in wildcats because of their hunting ability and began incorporating them into their spiritual beliefs. By the middle of the 4th century B.C., cats were considered to represent the physical embodiment of the goddess Bastet, the daughter of the sun god Ra, representing fertility and good health.¹

Written records show that the Romans were using cats primarily for rodent control by about 400 years A.D. By 200 B.C, cats could be found in India, and from 300 to 500 years A.D, their presence was noted in Britain.¹ As their presence spread throughout Europe, cats began to lose much of their value as sacred animals and companions and merely became a means of rodent control.

CHANGES DUE TO DOMESTICATION

Natural Selection

When any species undergoes domestication, specific changes occur. Through the ages, the animals tend to retain more juvenile characteristics into adulthood such as a foreshortened muzzle, smaller jaw with smaller and fewer teeth and a domed forehead. Haircoat colors, types and lengths are also affected. The haircoat color has more variety, the texture changes from a coarse coat to a softer, more “touchable” coat, and the coat length changes (i.e., shorter, longer, undercoat or guard hair disappears).¹

Natural selection is not the cause of the difference in appearance or behavior seen in domestic cats. Natural selection means that a certain characteristic is beneficial to a species for survival. The changes that have been made in many breeds have not been beneficial to the breeds, but have been choices that humans have made for cosmetic reasons. For example, Persian cats now have a shortened nose and rounded head. Many of these cats are unable to give birth normally because the kittens’ heads are bigger than the mother’s pelvis, so they routinely have to have cesarean sections. There has also been an increase in breathing problems and eye problems related to the shortened nose.

Breeds are also not necessarily restricted to a particular geographic area.⁷ In nature, geography limits where a certain species or breed inhabits. With domestication, animals travel with humans, and geography is no longer a concern.

Until recently, small subpopulations of domestic cats were allowed to reproduce with very little human intervention. Examples would include the Lake Van district of Turkey (Turkish Van), the tailless cats from the Isle of Man (Manx), the robust cats from northern Russia (Russian forest cat), and the short-haired, muscular cats with tightly

curled tails found in Japan (Japanese Bob tail). Today, intentional selective breeding has resulted in the creation of purebred breeds from these original subpopulations.¹

Selective breeding

Once cats began to leave Egypt, other forces such as genetic shift, hybrid vigor and eventually selective breeding contributed to further modifications in the cat's behavior and appearance.⁷

Selective breeding refers to the selection of cats for breeding based on the presence of desired structural or behavioral characteristics. A specific breed is comprised of animals that have been artificially selected to possess a uniform heritable appearance.⁷

A subspecies occurs when a distinct subpopulation naturally evolves that is separated geographically and differs morphologically from the original population of animals. This can be seen most obviously with the wildcat, which is divided into three subspecies according to location and habitat.⁷ *F. silvestris lybica* is found in the African savannah, *F. silvestris silvestris* is found on the British Isle, specifically Scotland, and *F.s silvestris ornate* is found in India.

A breed is designated as a group of animals that have been artificially selected over many generations to possess a uniform heritable appearance. Selective breeding is how individual breeds come into existence.⁷ Historically, the breeding of domestic cats has been under very little human control and only within the last 150 years have purebred cats been developed through artificial selection and strict control of breeding.⁷

Even without human interference, a number of mutations seem to have occurred early in the cat's domestication that led to new coat colors.⁷ The original coat color for the wildcat is a striped tabby (mackerel stripping). The blotched or classic tabby markings are considered an early mutation; other coat colors that emerged early and are now seen worldwide include black, orange, white spotted and all white. Cats in different parts of the world tend to have different coat colors. The prevalence of a native coat color in a particular area has been used to help deduce migration patterns of humans as they traveled with their cats throughout the world.⁷

CONCLUSION

Although cats are still used for their original purpose, that of rodent control –they also provide an added benefit: companionship. Their role in today's society is to greet their owners at the door at the end of the day, curl up on their laps and let them know that all will be right in the world as soon as they are petted.

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