

## **The Evolution of Domestic Cats.**

Domestic cats have been living with people for thousands of years. People have purposefully kept them for pest control, beauty, and companionship. The genome of domestic cats has diverged from that of their wild ancestors as the cats adapted to live with humans and humans cared for cats that they liked. Changes in the genome include areas implicated in behavior and reward responses, in digestion, and in coat colors<sup>1</sup>. These changes make our domestic cats not well suited to being wild animals living away from humans. Just like domestic dogs, which are no longer genetically suited to live like their ancestral wolf species, domestic cats are no longer genetically suited to live like their ancestral small *Felis sylvestris lybica* wildcats.

We should not hold domestic cats, whether random bred or of a pedigreed breed, to a standard of being able to survive in the wild, because generally domestic cats aren't physiologically, metabolically, or behaviorally suited for it.

## **The Genetics of Sphynx Cats**

Sphynx cats are a pedigreed breed of cats that have a mutation in a hair protein gene called KRT71 or Keratin 71<sup>2</sup>. A different mutation in the same gene leads to the curly coat in Devon Rex cats, and curly or wavy fur in mice and many dog breeds<sup>3</sup>. Sphynx are recognized for competition in most feline cat registration associations. They are a distinctive and popular breed both in competition and as pets. Sphynx cats are not truly hairless. They have very short downy hairs all over their bodies and often more obvious slight fur on their nose and tail tip. These short fine hairs that give them the feel of warm suede. The mutant keratin protein affects the growth and sturdiness of the hairs. The result is a lack of much visible fur.

Genetically altered mice have been engineered to lack the KRT71 gene entirely<sup>3</sup>. These mice have fur that comes and goes, but they grow and develop normally and have normal immune systems. The KRT71 gene is not essential for life or health.

## **Cat Welfare and the Breed Characteristics of Sphynx Cats**

Indoor only cats have a substantially longer average lifespan than indoor/outdoor or outdoor only cats. It is in the best interest of the welfare of a cat to keep it indoors, and to provide good nutrition, appropriate veterinary care, and an environment enriched with cat toys, affection, and activity. These together are defined as a well-kept indoor cat, the optimal condition.

A sphynx cat would not do well if abandoned in the wilderness in winter in a cold winter country. Neither would a human without clothes and shelter. Fortunately humans have clothes and shelter, generally. So does a well kept Sphynx cat. The absence of a thick coat of fur is no more of a hardship for a Sphynx cat than it is for a human. We do not advocate the sterilization of humans because they are not furry, nor do we judge people by whether they could live like a chimpanzee or an ape.

Like all cats, Sphynx cats may individually be healthy or unhealthy, but that is due to factors other than being a Sphynx cat. In locations with limited gene pools such as Britain, where the import process is onerous, a breed may have relatively few founding individuals and may therefore end up with an unusually high number of individuals who have a genetic problem. Ethical breeders then work to identify the problem, expand the gene pool with cats without it from outside of the affected group, and then steadily reduce the number of individuals at risk for the issue in their breeding programs. This is not simple, as eliminating all possibly problematic individuals quickly can restrict the gene pool even farther, causing worse problems down the road. This process occurs regularly. Efforts in these areas also have led to research on feline diseases and treatments for them, benefitting the welfare of all well-kept cats.

One specific skin disease has been mentioned by those interested in banning the breeding of Sphynx cats, *Malassezia* dermatitis. *Malassezia* yeasts are commensal organisms, part of the normal biota on the skin of warm blooded animals. About 90% of humans have *Malassezia* living on their skin. These yeasts eat skin oils. If you have oilier skin you provide a good environment for the yeast. *Malassezia* are most often harmless, only causing problems if their host organism has a serious health issue. In those cases overgrowth can cause dermatitis. This is more common in some breeds of dogs. It is very rare in cats. Researchers have looked to see what % of cats have *Malassezia* yeast on their skin, and how much they have. Unsurprisingly Sphynx that have not been washed for an extended period of time have a higher concentration of *Malassezia* yeast living on their skin than most other cats<sup>4</sup>. All of the cats studied were healthy. They did not have dermatitis. Sphynx get oily skin if they are not bathed every week or two, not unlike humans. Actual *Malassezia* dermatitis is occasionally found in all types of cats, not specifically Sphynx. A number of the cats studied have turned out to be seriously ill from other diseases. It has been suggested that if a cat is discovered to have *Malassezia* dermatitis, they should be checked for life-threatening, underlying diseases in cats.<sup>5</sup> *Malassezia* dermatitis is not common in Sphynx cats.

One of the characteristics of Sphynx cats is that their hair protein mutation may cause them to not have visible whiskers. Whiskers do provide cats with sensory information. They are likely useful for nocturnal hunting in their wild ancestors. No studies have been done on their importance for well-kept domestic cats. Domestic cats with long hair also typically have very dramatic long whiskers. Very short haired cats tend to have short ones. Mother cats sometimes chew the whiskers off their little kittens' faces. We do not know why. In terms of importance to a domestic cat we are left with a report of a young man in Austria who was sentenced to 6 months' probation for cutting off his cat's whiskers when he was drunk. This is not evidence for actual quality of life problems for whiskerless cats.

## Summary

Sphynx cats do not have any health or quality of life problems connected to the hair protein, Keratin 71, mutation that is characteristic of the breed. Banning their breeding, exhibition, or ownership is not supported by current evidence. The health problems that a Sphynx cat might have are not specific to Sphynx cats, but are found in other breeds or random bred cats as well. The Sphynx breed standard requires the cats to be sturdy and well-fleshed. When they are shown, healthy strong cats are rewarded. In general they are lively, intelligent, affectionate cats that like to snuggle with their owners. They are good cat companions.



## References

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