Reprinted from Modern Ferret magazine Issue #30.

When "White" is Right, or, If Ferrets Are Wild, Then Why Are They Albino?

By Bob Church

It brings a chuckle to my lips, a shake to my head, and sorrow to my soul as I listen to the objections voiced by many concerning the domesticated ferret. It is mind-boggling to think that in a society capable of building outposts in space, a small, inoffensive, and playful creature such as the ferret should be viewed with fear and misconception; often labeled as "wild" by governmental agencies. At a glance, without benefit of formal education, the youngest of school children can positively recognize the domesticated status of the pet ferret once they are taught a simple truth; in nature, albinism is rare and does not persist for any length of time. Although the mutation that causes albino animals can occur in any species at any time, albinism persists only in those animals cared for and protected by humans. That pet ferrets are commonly found as albinos, and that albinism in ferrets has been reported for at least a millennia, is overwhelming evidence that the ferret is clearly a domesticated animal. Interestingly, while both cats and dogs have been domesticated longer than ferrets, albinism is rare in these species for reasons I will explain later.

What is albinism? It is nothing more than a simple genetic mutation — a birth defect, if you wish — which prevents the formation of pigments in an animal's body. Among other things, the affected mammal has white hair, pale or pink skin, and red eyes. While an albino ferret's skin lacks most common pigments, it takes on a pinkish appearance because of the red blood cells circulating just under the surface. Their eyes are red for the same reason; you can see through the iris and observe the blood-rich retina lining the rear of the eye. This gives albinistic ferrets a case of red eye even the best photographer can't remove. Since the individual hairs within the fur lack pigment, they are colorless and transparent. They appear to human eyes as white because they reflect all wavelengths of light more or less equally, there being no pigments to absorb or reflect specific wavelengths which would grant some color to the fur. Still, it is common to see off-white-, yellowish-, or even amber-colored albino ferrets. How can that happen if the individual hairs are transparent and the ferret is a true albino? It is an optical effect caused by skin oils on the fur, which protect the ferret from cold and water and are used to advertise the ferret's presence to other ferrets — via the sense of smell. Like a microscopic prism, skin oils slightly bend light, making the fur appear yellowish; the more oil, the more bent light, the more the ferret appears yellow. As the oils oxidize, the effect is intensified because the oil itself turns a golden color.

Albinism in ferrets is very old, perhaps dating to the period of earliest domestication. Early accounts of ferrets exist in the works of Strabo and Pliney, who wrote about ferreting rabbits about 2000 years ago. Ferrets are probably mentioned in the writings of Aesop, Aristotle, and Aristophanes, who wrote about polecats or ferrets about 2500 years ago. These early Greek authors used a word which has been translated many ways, most recently as "house ferrets." However, the early writers were concerned with the pest-controlling attributes of the ferret, not the appearance. Isidore of Seville followed that trend about 1400 years ago, describing the habits of the ferret, rather than the appearance. About 800–600 years ago, the first good evidence that many domesticated ferrets were also albinos can be found in the descriptions and art of the day. Ferrets were frequently called "urine-colored" or the color of "old wool"; about 700 years ago, Albertus-Magnus said the ferret was "between white and yellow" in color. Obviously these refer to the yellowing of albino fur from body oil as described above. Perhaps the best known — although perhaps not commonly recognized — evidence of albinism in ferrets can be seen on the canvas of "Lady with Ermine," a 500+-year-old work by Leonardo da Vinci. The "ermine" is easily recognized by ferret owners as an albino ferret.

How is albinism proof of domestication? Obviously, albinism is rare in cats and dogs, and they have been domesticated far longer than the ferret. So why can we be certain that albino animals, persisting over centuries, are not wild, but instead

bred and maintained by humans when there are few albino dogs or cats? The reason is easy; dogs, cats, and ferrets have been selected by humans for a long time, and those animals which did not fit the human "standard" were never allowed to reproduce. In the case of dogs, people had a mental image of what a proper dog looked like, which did not typically include albinism. It was simply bred out whenever it occurred. In the case of cats, the same can be true, but because cats have historically been maintained more as mousers rather than pets, the same natural pressures which remove the albino trait in wild animals could be a factor. But with ferrets it was different; albinos were preferred for hunting because they were easier to discern from the rabbits they chased out of the burrows, and because they were easier for poachers to see in the dark. Besides, an albino female ferret, with a tail dyed black, made a respectable substitute for an ermine, which was in great demand. The point is, albinism in dogs and cats was discouraged by humans because the trait was seen as a fault; but in ferrets, the trait was encouraged because it was seen as an advantage for certain types of work the ferrets did.

The key to the proof that sustained albinism in ferrets is evidence of domestication lies with the fact that while albinism does occur on rare occasions in wild animals, it is not sustained within the population for long periods of time. Albino carnivores are easily spotted by prey and typically starve to death at a faster rate than normal colored predators. They are at a disadvantage because they have to work much harder to eat, so they typically die without passing the trait on to offspring. The same is true for albinistic prey; they are caught faster than normal colored prey because they are easier to see. The ferret is both a predator and prey, so has a double difficulty of evading owls while trying to sneak up on rabbits. In the wild, being an albino is a serious disadvantage, so the trait is rapidly bred out of existence. True, some animals have white coats for part of the year, such as ermine, and others seem to be permanently white, such as polar bear. In these cases, the lighter coats against a background of white is an advantage. It is interesting to note that ermine change from a normal (brownish) color in the summer to a white color in the winter; they are not albinos and neither are polar bears. They are normally pigmented animals who happen to have white fur. Although polecats never evolved the ability to grow a seasonal coat of white, both they and ferrets usually have a lighter colored coat during the winter season (unless artificial light has goofed up their photoperiod cycles).

There are other reasons albinism is not sustained for extended periods of time in nature. Albinos lack pigments in their eyes, making them very sensitive to bright light, which makes hunting all the more difficult. There is evidence other vision problems exist, making a hard job all the harder. Skin cancers are common in albinos because they lack melanin to absorb harmful rays of the sun. Because of their light appearance, they have difficulty finding mates, and even if they do, because albino carnivores are typically nutritionally stressed as a result of the difficulty obtaining food, they have smaller litters with fewer surviving offspring. There are other problems, but you get the idea; it is very difficult for albino animals to survive in the wild. The final straw is that albinism is a recessive trait; you need *two* copies of the recessive gene, which means both the mother and the father must carry the trait for any offspring to be albino. So in a wild species, even if the trait occurs, it is likely it will never be passed on to future generations.

As you can see, albinism is not maintained for long periods of time in most wild populations of animals, but it is sustained in ferrets. The only way that could happen is if some outside force artificially removed the natural pressures which would normally prevent an albino ferret from breeding. That outside force is human, who has made sure the albino ferret has enough to eat, who prevents other predators from killing him or her, and who purposely breeds albinos together to ensure albino offspring result. Get it? Easy, right?

Each and every time you see an albino ferret, you have proof they are not wild animals. They are albinos because humans domesticated them. Now you can also chuckle, shake your heads, and feel sorrow when some government official, in obvious fear and misconception, labels the domesticated ferret a "wild" animal.

Bob Church is currently working on a doctorate in zoo-archeology. He has done extensive research on the habits, history, and physical makeup of ferrets and other mustelids. Bob lives in Missouri with his 15 ferrets: *Bear, Daye, Chrys, Tori, Tui, Carbone, Lady Noir, Jezabel, Amber, Silly, G.W., Mickey Moose, Minnie Moose, Wizard, and Sorci.*