

Reading 2.2 – Domestication

To someone who hasn't been involved in a selective breeding program, it can seem astonishing to see how much people have been able to change the characteristics of animals and plants over time by selecting which ones will reproduce together.

Dogs were made tame through a process of selection to become accustomed to human provision and control. This taming process is called **domestication**. In some parts of the world dogs have been domesticated for at least 12,000 years. Before being domesticated, dog ancestors were wild and did have traits that allowed them to interact peacefully and submissively to people. Scientists have long wondered about how dogs were first domesticated. It is well understood that dogs were bred from wild wolves, but the question remains how did this occur? Was it done intentionally at first? Was it a selective breeding process? What part of the world was it done in? How many generations did it take to domesticate the first wolves to become more dog-like? Was there some advantage for humans in having domesticated "wolves" as part of their early camps and settlements?

Question 1: What were some of the most interesting ideas/insights you gained from looking at your first case study with your group in class, about breeding dogs and dog domestication?

Some scientists have attempted to domesticate the fox in order to better understand how selective breeding might have led to a domesticated dog. The surprising results of this experiment showed how quickly such selective breeding could lead to a "tame fox". The details of this experiment can be read further in at the following url:

<http://www.americanscientist.org/issues/feature/early-canid-domestication-the-farm-fox-experiment>

In summary the results from this experiment demonstrated that wild foxes can be quickly domesticated within nine generations to have traits that allow them to be handled as tame "pets" of humans. This rapid change in behavioral traits in the foxes occurred through selective breeding for tamer behaviors in each new generation of offspring. It led some scientists to propose a hypothesis about the origin of dogs. Surprisingly, the selective breeding also up generating other unexpected characteristics, such as floppy ears, curly tails, foxes that barked more, and had offspring more often and at a younger age than their ancestors just a few generations before. These are the same characteristics that we see in dogs, but never in wolves.

Question 2: Pick a type of wild land or water animal (besides wolves) that you think would be interesting to design a new selective breeding program around. Imagine the program you designed would last for 100 years of breeding experiments. What type of animals do you think might be useful to try to domesticate through selective breeding? Why

Question 3: Wild cats of various species live in many parts of the world. These cats are larger than house cats, more ferocious, and have behavioral traits that make them flee any perceived threat (including when they are startled or see an animal larger than it like a human). It is believed house cats were domesticated in one part of the world (the Middle East) as people began to settle in town and cities and started storing large amounts of harvested grains in the town. Storing grains led the arrival of pests and more bothersome animals that eat grains such as mice and rats.

Propose your own hypothesis about why house cats might have been first domesticated from wild cats. Include examples of possible variations in traits people might have found more advantageous in one cat over another, that led them to select those cats for selective breeding.
