

GENETICS

LESSON 11: ARTIFICIAL SELECTION

Learning Outcomes

- I can define artificial selection.
- I can explain how artificial selection can be beneficial.

Artificial Selection

- natural selection only acts on populations of animals affected by natural environmental selection pressures
- artificial selection occurs when domesticated animal populations are subjected to human controlled selection pressures → also called selective breeding
- allows for the breeding of specific traits within a species
 - dogs – protection (guard dogs), hunting, companion
 - cats – hair length, colour
 - horses – speed, strength, size
 - chickens – size of egg, laying frequency, size (meat birds)
 - fruits & vegetables – size, flavor, pit attachment (freestone peaches for canning)
 - grains – hardness, amount of grain produced, disease resistance

Consequences of Selective Breeding

- selective breeding focuses on attaining a specific trait or set of specific traits within a population
- sometimes, harmful traits may be overlooked or magnified in this pursuit
 - when related organisms are consistently breed together to maximize a desired trait, the level of genetic diversity decreases
 - may result in harmful recessive traits becoming magnified in the form of genetic disorders
- examples of frequency of bad traits becoming greater
 - hip dysplasia in dogs
 - kidney problems in Persian cats
 - low birth rates

Artificial Selection Video

<https://www.youtube.com/watch?v=fHS-OY9XDZc>

Questions

1. For each of the organisms listed below, identify two or three traits that may have been selectively bred for. (Hint: think of what each organism is used for.)
 - a. sheep improve meat quality and fleece quality
 - b. corn bigger cobs and sweeter corn and corn colour
 - c. apples improve flavor texture and colour
 - d. mandarin oranges seedless, improve flavor texture and colour
 - e. cows improve meat quality, size of animal, milk quality and volume
 - f. chickens improve meat quality, size of animal, quantity and quality of eggs

2. Today, most dogs are used for companionship. However, most breeds were originally bred for a specific purpose. Research online to identify what each of the following breeds of dogs were originally bred for and what traits were bred for.
 - a. Dachshund: was developed to scent, chase, and flush out badgers and other burrow-dwelling animals

 - b. Poodle: tracking to herding

 - c. Dobermann Pinscher: used for protection

 - d. Collie: herding dogs

 - e. Yorkshire Terrier: a companion dog because of its small size

 - f. Corgi: herding dogs