Selective Breeding

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What is Selective Breeding?

- **Selective Breeding**—the process by which humans breed other plants and animals for particular traits
- Requires controlled mating—animals that are social are easily manipulated
- Alleles that don't contribute to survival in the wild are favored
- Organisms that possess a large portion of desirable traits are bred
History of Selective Breeding

- Began 10,000 years ago after the first Ice Age ended

- Farmers began to choose better crops to harvest, particularly with shorter growing seasons, resistance to disease and pests, larger seeds and fruit, contains nutritional value, and better adaption to the conditions

- With current technology, time for food production is reduced
  - Makes life easier
How Does Selective Breeding Work?

- Selective breeding usually involves breeding two members of a species with the dominant allele if the desired characteristic.
  - Ex. A dog with long legs and is fast, would be breed with a dog that is strong and muscular. This way at least some of the puppies will be fast and strong.
- A breeder will track the characteristics of the litter and then breed these dogs with other dogs to get more desirable characteristics.
Why is selective breeding important?

- Loses the undesirable traits which is not reversible
- Creates genetic diversity
- Reduces food production time
- Ensures high survival rates
- Eliminates disease
The impact selective breeding has on agriculture

- Can make crops more edible, grow taller, or grow shorter
- Can cause animals to be more productive
  - Increase in wool production
  - Increase in meat production
  - Increase in milk production
- Make plants become resistant to poisons used on farms
Potential problems with Selective Breeding

● Some alleles are lost in the gene pool
  ○ The lost alleles could cause the plant or animal to die

● Loss of variety
  ○ If a disease strikes, it is likely to wipe out an entire organism

● Can cause animal discomfort
  ○ Ex: If a cow's udder is too large it can cause discomfort to the cow
Ethical Considerations

- There are no ethical considerations to consider because there is nothing wrong with this technology.
- The process is just breeding two animals together, so there are no ethical concerns.

http://www.biology-online.org/2/12_selective_breeding.htm

http://www.nature.com/scitable/knowledge/library/history-of-agricultural-biotechnology-how-crop-development-25885295