ANIMAL BREEDING

WHAT is a breed?

A breed is an animal with a distinctive look, behaviour and other characteristics that distinguish it from another animal of the same species. Just as there are different breeds of dogs (e.g., German Shepherd, Labrador Retriever, Standard Poodle), there are also various breeds of beef cattle, dairy cattle, pigs, etc.

Some farmers specialize in particular breeds because of that breed's traits. For example, dairy farmers often choose **Holstein** cattle because of their ability to produce a lot of milk. **Aberdeen Angus** and **Hereford** cattle, raised for beef, are popular in Canada because they have adapted well to our winters, are easy to care for and produce high quality meat.

Hereford cow
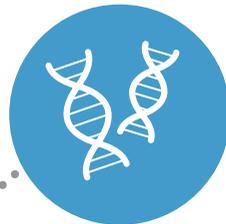
Hereford bull
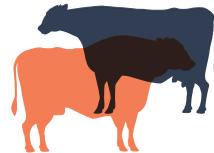
SELECTIVE BREEDING

Farmers have been breeding animals for years through **selective breeding** in attempts to build a herd of animals that are healthier and more productive. This involves selecting parents that have one or more desirable characteristics that farmers hope offspring will inherit.

Once an animal is born with a good trait, then there is a chance that trait can continue to be passed on to future generations. Over time, more animals in the herd will be born with the desired trait(s).

The animals may be of the same breed or different breed.

Crossbreeding generally involves animals of the same species (e.g., beef cattle with another breed of beef cattle), but sometimes it can occur between two different, but related, species. For example, breeding a female horse with a male donkey results in a mule. Mules look similar to donkeys, but are larger and stronger. They also have more stamina than a horse and tougher hooves, which makes them better suited for carrying large loads over rough ground. Mules are sterile, which means they are unable to reproduce.

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NATURALLY SELECTED BY NATURE

Changes to genetic traits can be nature's way of adapting living organisms to their environment in order to survive. For example, N'Dama cattle raised in West Africa have developed a resistance to sleeping sickness spread by the tsetse fly, which is fatal to most other breeds of cattle. This is called **natural selection**.

GENETIC SELECTION

Traits are passed on from parents to offspring in the form of genes, which are segments of DNA, small bits of genetic information in cells. Techniques have been developed to identify and isolate the makeup of genes for desirable traits such as meat production or disease resistance. These techniques provide animal breeders with the ability to identify animals with desirable genes.

Because of genetic selection, Canadian farmers have a national dairy herd that is considered to be among the highest level of genetic quality in the world.

Angora goat (raised for wool) **Boer goat (raised for meat)**

Another development in cattle breeding is the **Embryo Transfer Technique** (ETT) which makes it possible to pass on the genetic traits of top quality animals to future generations.

ETT involves the removal of an egg from the reproductive tract of a superior quality cow which has been fertilized by a superior quality bull and placing it into the reproductive tract of a second cow. The resulting offspring calf will inherit the characteristics of the parent animals.[1]

Meat chickens are bigger and grow faster than egg laying chickens.

Improvements in poultry breeding have resulted in chickens that can produce more meat for people to eat. Because today's chickens grow faster and more efficiently, poultry farmers can produce more chicken using less feed and in a shorter amount of time without using hormones or medications.

How do farmers breed animals?

Modern breeding for many species of farm animals (**livestock**), including dairy cattle, poultry and pigs, is often accomplished through **artificial insemination** (**AI**) which involves planting the semen from the male into the female's uterus.

Artificial insemination makes it possible for breeders throughout the world to introduce the best traits into their herds, even though males with those traits might not live nearby.

Yorkshire pigs, common in Canada, are hardy, grow quickly and produce large litters of piglets.