

# Difference Between Heterosis and Hybrid Vigour

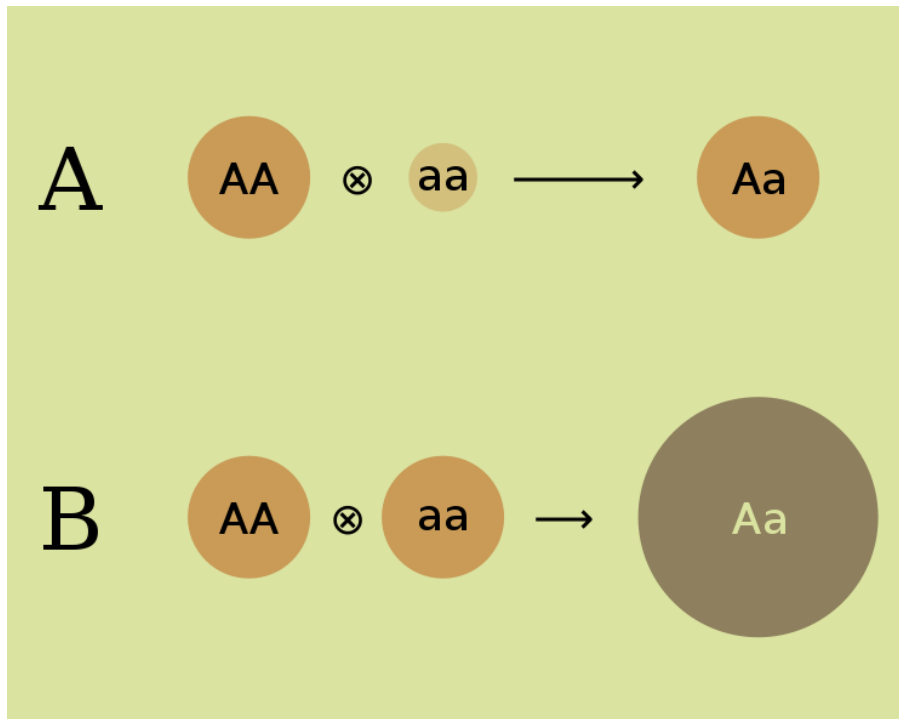
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## Key Difference - Heterosis vs Hybrid Vigour

Breeding techniques of crops and organisms evolved over the past centuries. As [biotechnology](#) developed rapidly, modern techniques of breeding with the modern terminology related to them were introduced to identify these breeding methods. [Hybridization](#) is one such technique used to breed crops as well as organisms. Hybridization involved the crossing of two [homozygous](#) inbreds which are genetically non – identical to produce a hybrid variety in the first filial generation (F1). **Hybrid Vigour is the phenomenon where the F1 generation hybrid shows superiority or an increased productivity in comparison to the parent generation in contrast to that in Heterosis which involves in the process of producing the hybrid vigour through the hybridization technique in the F1 generation.** This can be elaborated as the **key difference** between Hybrid Vigour and Heterosis. There is also a difference between the terminology of the two terms Hybrid vigour and Heterosis as described by Whaley in 1944. It is more appropriate to term the developed superiority of the hybrids as hybrid vigour whereas heterosis can be used to describe the mechanism by which superiority is developed.

## What is Heterosis?

Gottingen in 1914, proposed the term heterosis. Heterosis is defined as the process of hybridization where two homozygous individuals or species are crossed with each other to yield a hybrid variety. In heterosis, the hybrid variety resulting from hybridization has superior characteristics than to its parents. The hybrid F1 generation offspring has a higher productivity in heterosis. Due to this superiority shown by the F1 generation offspring, it is known as hybrid vigour.



**Figure 01: Heterosis**

Heterosis is a result of two main phenomena; [Dominance](#) and Overdominance. Davenport, Bruce and Keable, and Pellew proposed this theory in 1910. This theory is based on the assumption that hybrid vigour resulting from heterosis (hybridization) brings the dominant, favorable genes together. It also states that the harmful genes remain [recessive](#) in the resulting offspring. Thus the resulting F1 generation offspring will have a favorable combination of genes from both parents.

There are two main types of Heterosis; true heterosis and pseudo heterosis. True heterosis is the type of hybridization which is inherited. It can further be categorized as mutational true heterosis and balanced true heterosis. Mutational true heterosis is when the hybrid vigour produced by heterosis suppresses harmful, lethal genes present in the parent varieties and express only the superior genes. Balanced true heterosis is when the hybrid vigour produced via heterosis shows balanced characters of both parents. This is an important property in crop breeding in order to incorporate agronomically important characters to crop plants.

Pseudo heterosis is an accidental hybridization process taking place under natural conditions and resulting in hybrid vigour which produces superior characters. Conventional breeding techniques rely much on pseudo heterosis as the conventional farmers were not aware of the technicalities of breeding in order to proceed with targeted in vitro breeding techniques.

## What is Hybrid Vigour?

The term Hybrid Vigour was coined by Darwin in 1876. Hybrid Vigour is the resulting superior F1 offspring from heterosis or hybridization of two homozygous varieties. Hybrid Vigour results in the F1 generation after hybridization show superior characteristics with increased characteristics.



**Figure 02: Hybrid Vigour shown by a mixed-breed dog**

The beneficial characteristics shown by the hybrids especially in crop breeding are economically important such as increasing in size, the introduction of resistance genes such as disease resistance, pest resistance, climate resistance, increased nutritional value and increased yield. Biological effects of hybrid vigour include an increase in [fertility](#) and survival ability.

## What are the Similarities Between Heterosis and Hybrid Vigour?

- Both occur as a result of hybridization which takes place between two homozygous parent varieties.
- Both result in superior varieties in comparison with the parent generations.
- Both are used as breeding techniques.

## What is the Difference Between Heterosis and Hybrid Vigour?

Heterosis vs Hybrid Vigour	
Heterosis is the process of producing the hybrid vigour through the hybridization technique.	Hybrid Vigour is the phenomenon where the F1 generation hybrid shows superiority or an increased productivity in comparison to the parent generation.
Introduced by	
Heterosis was introduced by Gottingen in 1914.	Hybrid vigour was introduced by Darwin in 1876

## Summary - Heterosis vs Hybrid Vigour

Heterosis and Hybrid Vigour have very similar meanings. Nevertheless, hybrid vigour is the superior variety produced by the process of heterosis. The superior hybrid vigour in the F1 generation is produced due to the theory of dominance and codominance. This hybrid vigour exhibits many beneficial characteristics into offspring which are of economically important traits. This is the key difference between Hybrid Vigour and Heterosis.

### Reference:

1. "Heterosis or Hybrid Vigour: Types, Causes, and Effects." Biology Discussion, 2 Feb. 2016. [Available here](#)
2. The Editors of Encyclopædia Britannica. "Heterosis." Encyclopædia Britannica, Encyclopædia Britannica, inc., 20 July 1998. [Available here](#)
3. Birchler, James A., et al. "Heterosis." The Plant Cell, American Society of Plant Biologists, July 2010. [Available here](#)

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