

Genetic Correlation. The correlation between breeding values for two traits is called genetic correlation and indicates to what extent the two traits are influenced by the same genes. For example, the genetic correlation between milk yield and protein yield (.9) is high. Many of the same genes that influence milk yield also influence protein yield, and a bull with daughters that have high mean milk yield almost always will sire daughters that have high mean protein yield. However, the genetic correlation between milk yield and fat percentage is -.3; therefore, bulls with daughters that have high milk yield often will have daughters with low fat percentage. As with any correlation, the larger the magnitude (i.e., the farther from 0), the greater is the relationship between the traits. For a heritable trait, selection of genetically superior animals to be parents (i.e., genetic selection) will produce offspring that are genetically better on average for that trait. This result is called response to selection. Genetic selection on such a trait will also affect any genetically correlated characteristics; this is called correlated response to selection.