Chapter 11: Crossbreeding

Bakewell (see chapter 1) was not only the founder of practical breeding but also the founder of the first standardized breeds. Before 1850 mankind used landraces in farming and other activities. It were populations very well adapted to the places they were kept. But their characteristics, their phenotypes were highly variable and the characteristics of their progeny were hardly predictable. Bakewell bred the first standardized breeds according to a breeding standard for conformation and a defined breeding goal. In this way selection for a few characteristics in a landrace led to the creation of a (standardized) breed.

Definitions

A breed is an interbreeding group of animals within a species with some identifiable common appearance, performance, ancestry or selection history. Many definitions are used to define this concept. See 11.1 for more details.

Crossbreeding are matings between animals of different breeds or lines

Crossing of animals of different breeds is systematic mating of animals of different breeds as part of a well-designed breeding program. What are the pro’s en cons of crossbreeding in commercial beef, poultry and pig breeding? In this chapter we first explain the theoretical background of crossbreeding and the different crossbreeding systems before we outline the structure breeding programs in the next chapter. Crossing takes place after the selection of parents in different breeds or lines (phase 5 in the figure below) and is structurally embedded in a breeding program (phase 6).

Many standardized breeds in horses and dogs are the result of crossing animals of different breeds (landraces or standardized breeds) in combination with a strong selection among the crossbred animals for characteristics of the breeding standard. Thus, consequent selection for specific characteristics has led to the existence of a wide variety of breeds within the domesticated species. Breeds differ in characteristics and for specific production goals, combining characteristics of different breeds might be required. For that reason sometimes breeds are crossed. E.g. in tropical countries a local cattle breed with a high tick resistance is crossed with an exotic breed with a high production to obtain animals with a moderate production resistant to ticks.

In this chapter we will explain the following topics:

- The genetic background of heterosis
- Motivation for crossbreeding
- The different crossbreeding systems and their applicability