Chapter 1: Introduction to animal breeding

In this first chapter the history of animal breeding is presented. The importance of selection by nature and important aspects of the domestication process will be described. Mankind started to create breeds accompanied with artificial selection 250 years ago. Nowadays, breeding of high productive farm animals, like cattle, pigs and poultry is in the hands of multinational companies which invest a lot of money in state of the art breeding programs. The breeding of sheep, goats, horses and companion animals, e.g. the dog is based on individual breeders collaborating in the setting of a herd book or a breeder’s association. Animal breeding is aiming at the improvement of animals by changing their genetic abilities for important traits. These traits are determined by the requirements and wishes from the society which might change over time. Animal breeding is highly influenced by research and developments in population-, quantitative- and molecular genetics. Sometimes, unexpected negative effects of animal breeding are observed that require adequate corrections. A breeding program will be presented here as a circular activity. Each generation, the program starts with formulating the breeding goal and ends with a critical review of the results obtained in the next generation. The evaluation might lead to a reconsideration of the breeding goal for the next round of selection.

1. Definition of production system
2. Definition of breeding goal
3. Collection of information
   - Phenotypes
   - Family relationships
   - Genotypes
4. Determining selection criteria
   - Genetic model
   - Breeding value estimation
5. Selection and mating
   - Predicting selection response
   - Consequences of mating decisions
6. Dissemination
   - Structure of breeding program
   - Crossbreeding
7. Evaluation
   - Genetic improvement
   - Genetic diversity

Breeding program