This textbook contains teaching material on animal breeding and genetics for BSc students. The text book started as an initiative of the Dutch Universities for Applied (Agricultural) Sciences. The textbook is made available by the Animal Breeding and Genomics Centre (ABGC) of Wageningen UR (University and Research Centre). It is written by two animal breeding scientists from Wageningen UR: Kor Oldenbroek from the Centre for Genetic Resources the Netherlands and Liesbeth van der Waaij from the Animal Breeding and Genomics Centre. Four BSc teachers contributed to this textbook by a critical review of the draft texts: Aline van Genderen from HAS-Den Bosch, Hans van Tartwijk from Van Hall-Larenstein in Wageningen, Jan van Diepen from CAH-Vilentum in Dronten en Linda Krijgsman from Inholland in Delft. Their contribution is gratefully acknowledged. Financial support for writing this textbook came from the WURKS programme of Wageningen University.

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You will notice that some subjects seem to pop up in a number of chapters. That is because they are related to a number of steps and in each step they require a specific attention. That is why they are mentioned in a number of chapters instead of having one chapter just about that subject. The role of genetic relationships, for example, is such a subject. At the end of studying the book you will have gained insight in how a breeding program should be organised, what are some critical points, and what are consequences of certain breeding decisions. The book is organised such that each chapter starts with a general description of the subject, what is its role in a breeding program, and some points of attention. Then we go a bit deeper and introduce tools (formulas) that provide results to help executing the step in the breeding program accurately. We will use a few formulas to be able to do some basic calculations.