

1. Record Nr.	UNINA9910768171503321
Titolo	Animal breeding and genetics // Matthew L. Spangler, editor
Pubbl/distr/stampa	Singapore : , : Springer, , [2023] ©2023
ISBN	9781071624609 9781071624593
Descrizione fisica	1 online resource (421 pages)
Collana	Encyclopedia of sustainability science and technology series
Disciplina	636.082
Soggetti	Animal breeding Domestic animals - Genetics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Intro -- Series Preface -- Volume Preface -- Contents -- About the Editor-in-Chief -- About the Editor -- Contributors -- Animal Breeding and Genetics: Introduction -- Animal Breeding Methods and Sustainability -- Glossary -- Definition of the Subject -- Introduction -- Animal Breeding and Sustainability -- Definition of Breed -- Breed Conservation -- Breeds and Sustainable Systems -- Animal Breeding Methods and Schemes -- Breeding Companies. Organization and Diffusion of Genetic Progress -- Statistical Methods of Selection -- The Use of Molecular Genetics in Animal Breeding -- Transgenesis -- Genetic Markers and Genomic Selection -- Future Directions -- The Future Evolution of Methods and Schemes -- The Limits to Genetic Progress -- Bibliography -- Primary Literature -- Books and Reviews -- Quantitative Methods Applied to Animal Breeding -- Glossary -- Definition of the Subject -- Introduction -- Principles of Selection -- Basic Genetic Model for Quantitative Traits -- Phenotypic Selection -- Correlated Response and Indirect Selection -- Selection Index -- Multiple-Trait Selection -- Mixed Model Methodology -- Introduction -- The Animal Model -- Extensions and Variations of the Animal Model -- Marker-Assisted Selection -- Introduction -- Classical Approaches with Few Markers -- Genomic Selection -- Future Directions -- Bibliography -- Primary Literature -- Books and Reviews --

Foundations of Molecular Genetics: From Major Genes to Genomics -- Glossary -- Definition of the Subject -- Introduction -- The Promise of Molecular Genetics -- The Quest of Gene Mapping -- Elusive Validation and Repeatability -- The Challenges of Fine Mapping -- Positional Cloning of QTN - Success Stories -- New Genomic Approaches to Discover Causative Mutations -- The Advent and Rise of Genomic Selection -- Opportunities for Improved Sustainability -- Conclusion. Bibliography -- Building Genetic Models -- Glossary -- Definition of the Subject -- Introduction -- The Introductory Equation -- Completing the Model -- Adding a Constant to the Model -- Parts of the Mixed Model -- Fixed Factors -- Covariates -- Fixed Factors, Solutions, and Estimable Functions -- Example with Constraints -- Interactions Between Fixed Factors -- Heterosis -- Maternal Effects and Heterosis -- Singularities with Fixed Effects and Random Effects -- Is It Fixed or Random? -- Genetic Values and Other Random Factors -- Prediction of Genetic Values Depends on Variance Components -- The Basic Animal Model -- Animal Model with Repeated Records -- Embedded Traits -- Maternal and Paternal Effects Model -- Maternal and Grandmaternal Model -- Competition-Social Interaction-Pen Mate Effects -- Dominance Genetic Values -- Genotype by Environment Interactions -- Sex Limited Traits -- Usual Multiple Trait Models -- Normality -- Typical Fixed and Random Effects in Models for Yield of Dairy Cows, Weaning Weight of Beef Calves and Lambs, and Carcass Trait... -- Future Directions -- Bibliography -- Primary Literature -- Books and Reviews -- Genotype by Environment Interactions in Livestock Farming -- Glossary -- Definition of the subject -- Introduction -- Expanding the Model -- Example: Environment and Diet Composition (ExA) -- Example: Environment and Sow Housing (ExB) -- The Baseline Model -- The Multiple-Trait Model -- The Random-Regression Model -- The Reproducing Kernel Hilbert Spaces Regression Model -- How to Express and Report the Breeding Values -- Caveats When Estimating Breeding Values for GxE -- Macro-environmental Plasticity: Estimation of Variance Components -- Macro-environmental Plasticity: Prediction of Breeding Values -- Micro-environmental Plasticity and Its Covariance with Macro-environmental Plasticity -- Future directions.

References -- Socially Affected Traits, Inheritance and Genetic Improvement -- Glossary -- Definition of the Subject -- Introduction -- Quantitative Genetics of Socially Affected Traits -- Quantitative Genetic Model -- Classical Model -- Social Model -- Breeding Value -- Heritable Variance -- The Effect of Group Size on Heritable Variance -- Response to Selection -- General Expression for Response to Selection -- Accuracies of Selection -- Individual Selection (IS) -- Group Selection (GS) -- Multilevel Selection -- Optimum Index Selection -- Selection Based in Information of Relatives -- Selection on Estimated Breeding Values (EBVs) -- BLUP Ignoring Associative Effects -- BLUP Including Associative Effects -- A Special Case: Maternal Genetic Effects -- Results of Social Selection Experiments -- Estimation of Genetic Parameters -- Statistical Methodology -- Empirical Estimates of the Associative Variance -- Mixed Models -- Non-Genetic Associative Effects -- Accounting for Variation in Group Size -- Identifiability of the Associative Genetic Variance -- Statistical Power and Optimum Designs -- Standard Errors of Estimated Variance Components -- Future Directions -- Bibliography -- Pig Breeding for Increased Sustainability -- Glossary -- Definition of the Subject -- Introduction -- Biodiversity -- Genetic Distinctiveness -- Population Size and Structure -- Relative Utility -- Urgency, Importance, and Feasibility: Priority Level of the Breed -- Target Traits for Genetic Improvement --

Genetic Improvement Programs -- Environmental Load and Climate Change -- Technology -- Strategies: Carbon Shadow Prices -- Animal Welfare -- Robustness -- Selection for Robustness Traits -- Reaction Norms -- Deprivation -- Neuroendocrinology -- Selection Objectives -- Dominance Aggression -- Avoidance of Invasive Treatments -- Boar Taint -- Harmful Interactional Behavior.

Ethical Aspects -- Artificial Selection -- Integrity -- Future Directions -- Acknowledgments -- Bibliography -- Primary Literature -- Books and Reviews -- Poultry Breeding -- Glossary -- Definition of the Subject -- Introduction -- Input Resources (Background) -- Environmental Impact -- Human and Animal Health -- Practical Example of Sustainable Genetic Improvement -- Balanced Breeding for Optimized Genetic Gain, Maintained Genetic Diversity, and Decreased Impact on Functional and Environment... -- Future Directions -- Bibliography -- Beef Cattle Breeding -- Definition of the Subject -- Introduction -- Beef breeds -- Genetic Differences for Beef-Related Traits -- Current Beef Breeding Objectives -- Terminal indexes -- Maternal Indexes -- Dairy-Beef Index -- Validation -- Future Breeding Objectives -- Improvements to the Current Selection of Traits -- New traits -- Estimation of Weighting Factors on Traits -- Beef Breeding Schemes -- Decision Support Tools -- The Role of Breed Societies -- Future Challenges -- Conclusions -- References -- Books and Reviews -- Novel Trait Selection to Enhance Sustainability of Beef Production Systems -- Glossary -- Definition of Subject -- Introduction -- Sustainability as a System Property -- Characteristics of High-Leverage Actions -- Trait Selection Impacts on Sustainability -- Specific Examples of Novel Traits to Address Sustainability -- Water Intake and Efficiency -- Methane Emissions -- Future Directions -- References -- Dairy Cattle Breeding -- Glossary -- Definition of the Subject -- Introduction -- Changing Breeding Programs -- Traits Under Selection -- Milk Production and Fertility -- Longevity -- Health and Disease Resistance -- Mastitis -- Lameness -- General Disease Resistance -- Novel Traits -- Mid-Infrared Spectroscopy -- Resilience -- Heat Tolerance -- Environmental Impact -- Feed Efficiency.

Animal Welfare -- Inbreeding -- Future Directions -- Bibliography -- References in the Text -- Books and Reviews (Further Reading) -- Sustainable Genetic Improvement in Dairy Goats -- Glossary -- Definition of the Subject -- Introduction -- Dairy Goat Production and Breeding Programs -- Genetic Evaluation of Dairy Goats: The Canadian Example -- Genomic Selection Methodologies -- Benefits of Genomic Selection -- Benefits and Challenges of Implementing Genomic Selection in Dairy Goats -- Implementation of Genomic Selection in Dairy Goats -- Development of Genotyping Panels -- Genomic Selection in Worldwide Dairy Goat Populations -- Genome-Wide Association Studies -- Final Remarks -- Future Directions -- Bibliography -- Horse Breeding -- Glossary -- Definition of the Subject -- History of Modern Horse Breeds -- Modern Horse Breeds -- Breed Management -- Breeding for Improvement -- Breeding for Diversity -- Future Directions -- Bibliography -- Primary Literature -- Books and Reviews -- Breeding in Developing Countries and Tropics -- Glossary -- Definition of the Subject and Its Importance -- Introduction -- Setting the Scene -- World Population -- Global Food Production -- Products of an Animal Origin -- Global Food Security -- Animal Resources -- Domestication -- Distribution of Livestock -- Biodiversity as Reflected by Breed -- The Most Important Livestock Products for Ensuring Food Security -- Poultry -- Pigs -- Cattle -- Small Stock -- Per Capita Meat Consumption -- Dairy Products -- Challenges -- External Challenges -- Production under Various Systems -- Disease --

Heat Stress and Water Requirements -- Internal Challenges --
Infrastructure and Capacity -- Structured Programs -- Tools and
Strategies in Livestock Breeding -- Research Expenditure -- Intellectual
Capacity -- The Contribution of Developing Countries to Global
Science.
The Case for Conserving Animal Genetic Resources.
