Livestock Genetics & Selection Training Course

Professional Development Training Course Outline

Category	Veterinary and Animal Science	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Livestock Genetics & Selection is a transformative discipline that integrates Genomic Selection, Precision Breeding, Biotechnology, Artificial Intelligence in Agriculture, Sustainable Livestock Production, and Climate-Resilient Breeding Systems to enhance productivity, profitability, and food security. In the era of Data-Driven Agriculture and Genomic Innovation, livestock improvement programs are shifting from conventional breeding to advanced tools such as DNA Marker-Assisted Selection, Genome-Wide Association Studies (GWAS), Reproductive Biotechnology, and Digital Herd Analytics. Livestock Genetics & Selection Training Course is designed to empower professionals with cutting-edge competencies in Genetic Evaluation, Breed Improvement Strategies, Genomic Prediction Models, and Performance Recording Systems to meet global demands for high-yield, disease-resistant, and climate-adaptive livestock.

With increasing pressure from Climate Change, Antimicrobial Resistance, Food Security Challenges, and Carbon Footprint Reduction Goals, modern livestock systems must adopt Sustainable Genetic Improvement Programs aligned with global frameworks such as the Food and Agriculture Organization (FAO) guidelines and livestock development standards promoted by the World Organisation for Animal Health (WOAH). This comprehensive training bridges the gap between science and application by integrating Genomic Technologies, Breeding Value Estimation, Bioinformatics Tools, and Precision Farming Innovations to create future-ready livestock breeding leaders.

Programme Curriculum

Livestock Genetics & Selection Training Course

Introduction

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Course Objectives

1. Master Genomic Selection & Genome-Wide Association Studies (GWAS) for accelerated breed improvement.
2. Apply Marker-Assisted Selection (MAS) & SNP Genotyping Technologies in livestock breeding programs.
3. Develop Estimated Breeding Values (EBVs) & BLUP Models using advanced statistical tools.
4. Design Climate-Smart Livestock Breeding Strategies for sustainability and resilience.
5. Integrate Artificial Intelligence & Machine Learning in Genetic Evaluation Systems.
6. Implement Precision Livestock Farming (PLF) & Digital Herd Monitoring Systems.
7. Utilize Reproductive Biotechnologies (AI, ET, IVF, MOET) for rapid genetic gain.
8. Analyze Heritability, Genetic Correlations & Selection Index Models.
9. Establish Performance Recording & Pedigree Data Management Systems.
10. Apply Bioinformatics & Genomic Data Analytics for breeding decisions.
11. Develop Disease-Resistant & High-Productivity Genetic Lines.
12. Design Sustainable Crossbreeding & Breed Conservation Programs.
13. Evaluate Carbon-Efficient & Low-Emission Genetic Traits in livestock systems.

Target Audience

1. Livestock Breeding & Genetics Professionals
2. Veterinarians & Animal Health Specialists
3. Agricultural Extension Officers
4. Dairy, Poultry & Meat Industry Managers
5. Animal Science & Veterinary Students
6. Research Scientists & Genomic Analysts
7. Livestock Entrepreneurs & Farm Owners
8. Policy Makers & Livestock Development Planners

Course Modules

Module 1: Fundamentals of Livestock Genetics

- Principles of **Quantitative & Molecular Genetics**
- Mendelian Inheritance & Population Genetics
- Heritability & Genetic Parameters
- Genetic Variation & Selection Response
- Case Study: Dairy Genetic Improvement Programs in **Netherlands**

Module 2: Genomic Technologies & Bioinformatics

- SNP Markers & Whole-Genome Sequencing
- GWAS & Genomic Prediction Models
- Bioinformatics Software Applications
- Genomic Data Interpretation
- Case Study: Genomic Selection in **United States** Dairy Industry

Module 3: Breeding Value Estimation & Statistical Models

- BLUP & Advanced Genetic Evaluation Models
- Selection Index Theory
- Genetic Trend Analysis
- Data Recording & Quality Control
- Case Study: National Genetic Evaluation Systems in **Australia**

Module 4: Reproductive Biotechnology & Accelerated Breeding

- Artificial Insemination (AI) Programs
- Embryo Transfer (ET) & MOET
- In Vitro Fertilization (IVF)
- Sexed Semen Technology
- Case Study: Elite Breeding Programs in **Brazil** Beef Sector

Module 5: Precision Livestock Farming & AI Integration

- Smart Sensors & Wearable Technologies
- AI-Based Genetic Prediction
- Big Data in Livestock Management
- Digital Herd Monitoring Systems
- Case Study: Smart Dairy Farms in **Denmark**

Module 6: Climate-Resilient & Sustainable Breeding

- Climate-Smart Genetic Traits
- Heat Tolerance & Disease Resistance
- Low Methane Emission Breeding
- Sustainable Crossbreeding Systems
- Case Study: Indigenous Breed Conservation in **India**

Module 7: Breed Improvement & Conservation Strategies

- Open Nucleus Breeding Systems
- Crossbreeding & Hybrid Vigor

- Genetic Diversity Preservation
- Breed Registry & Certification
- Case Study: Sheep Genetic Programs in **New Zealand**

Module 8: Policy, Ethics & Global Livestock Development

- International Breeding Policies
- Genetic Resource Management
- Ethical Issues in Genomic Editing
- Intellectual Property in Genetics
- Case Study: FAO Global Plan of Action Implementation

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com