

Analysis of Pedigree in Livestock Breeding



Historical Background



- First documented pedigrees (e.g., Arabian horses, royal bloodlines)

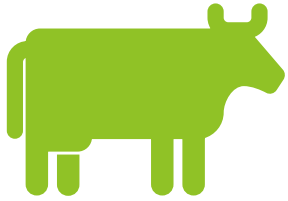


- Development in livestock (19th-20th century)

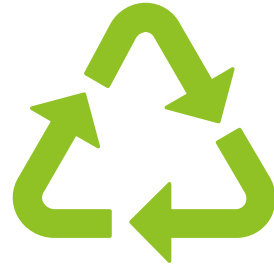


- Role of herdbooks and breed associations

Pedigree in Modern Animal Breeding



- Integration into breeding programs

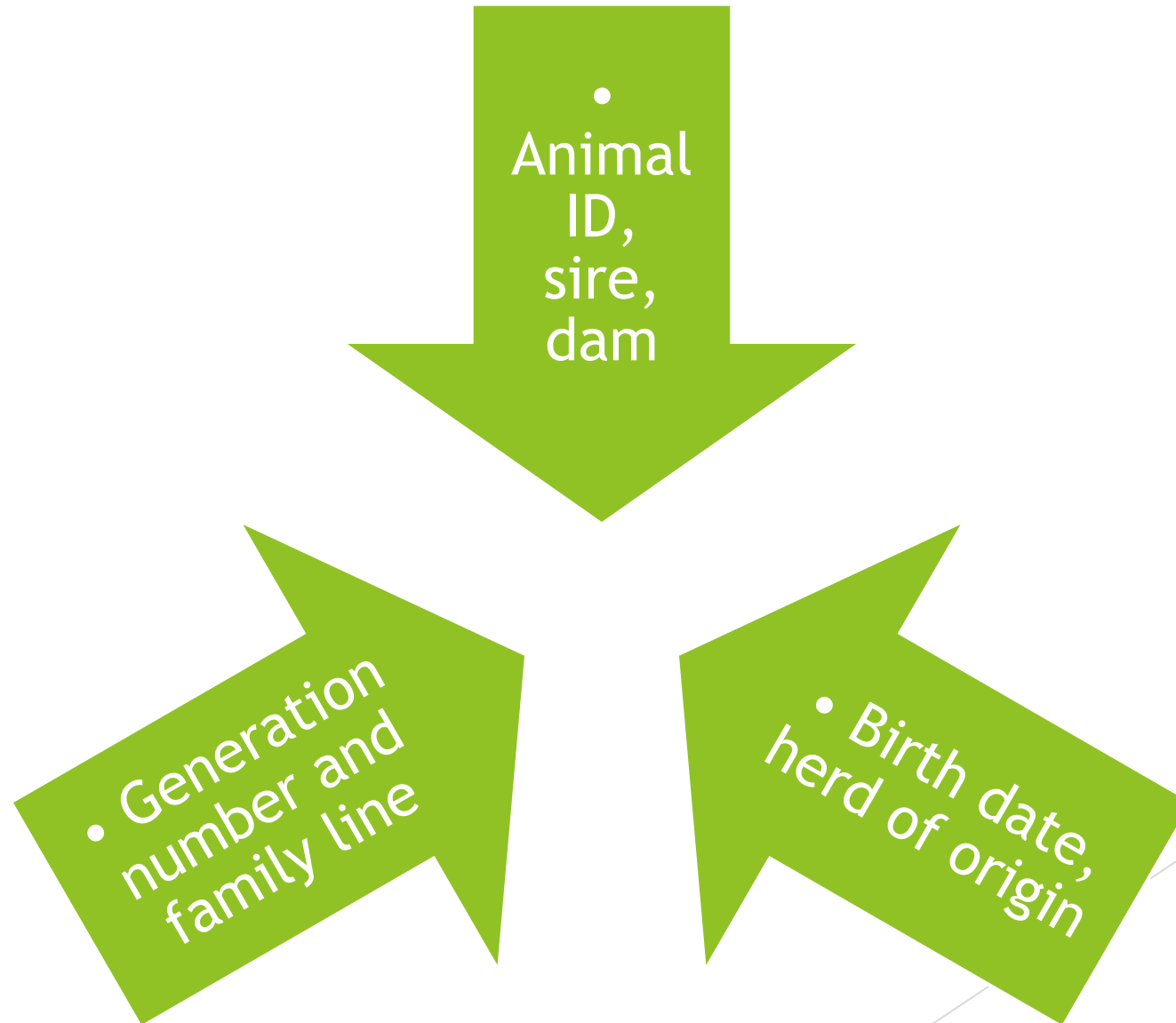


- Use in selection and conservation



- Relationship with performance recording

Components of Pedigree Data



Pedigree Completeness and Quality



- Depth (number of generations)



- Completeness index



- Influence of missing data

Applications of Pedigree Analysis

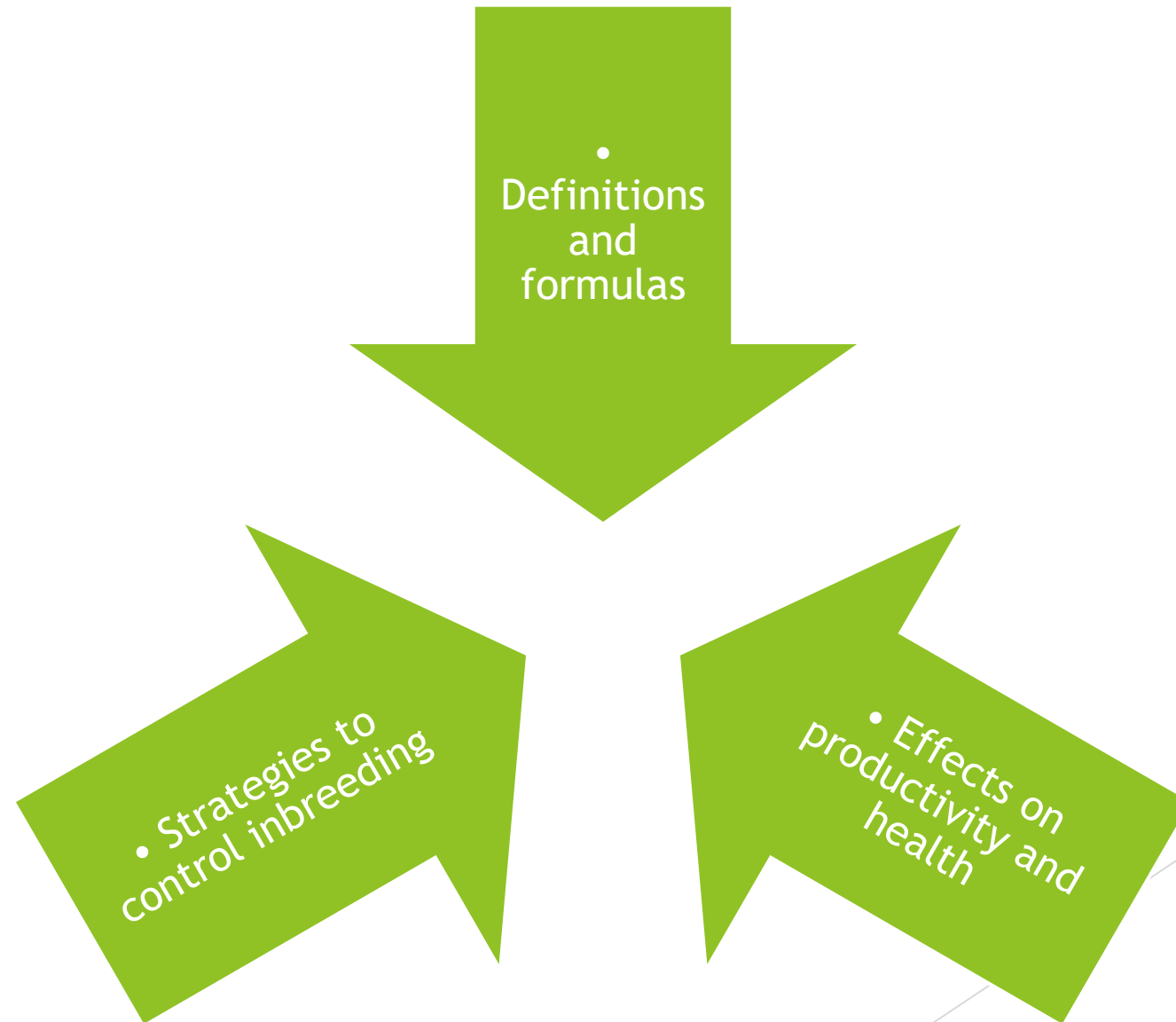
- Estimating inbreeding coefficients

- Calculating relationship coefficients

- Estimating effective population size (N_e)

- Managing genetic diversity

Inbreeding and Kinship



Effective Population Size (N_e)



- Why N_e matters in livestock conservation



- Pedigree-based vs. genomic-based N_e



- Estimation methods

Advantages of Pedigree Analysis



- Long-term data availability



- Cost-effective



- Useful for conservation and selection

Limitations of Pedigree Analysis

- Errors in parentage
- Incomplete or shallow pedigrees
- No direct information on genetic variants

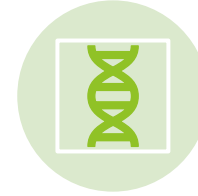
Tools and Software



- PEDIG software



- END OG, GRain, EvaPig



- Integration with BLUP and genetic evaluation

Pedigree vs. Genomic Data



- Complementary roles



- Pedigree: expected relationships



- Genomics: realized relationships



- Use in combined breeding strategies

Case Study: Local Breed Conservation



- Pedigree analysis in indigenous breeds



- Managing genetic erosion

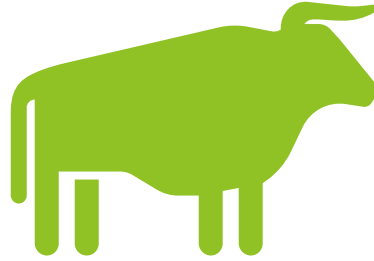


- Reconstructing pedigrees

Best Practices in Pedigree Management



- Data recording and validation



- Animal identification systems



- Regular pedigree audits

Future Perspectives



- Digitization and blockchain



- Integration with genomics and AI



- Pedigree reconstruction using inference tools

Summary



- Pedigree analysis is essential for genetic management



- Strengths: accessible, interpretable



- Weaknesses: dependent on data quality

Questions and Discussion



- Thank you!



- Questions?