Animal Breeding Technology
AAT 31022 (20/20)

Evaluation

Continuous Assessment (CA) – 30%

End Semester Exam (ESE) – 70%

Animal Breeding – History

- Taking place for thousands of years
- Until 1700's systematic animal breeding did not exist
- English agriculturist Robert Bakewell –
- ➤ Successful breeder of commercial livestock in the 18th century.
- ➤ His work was based on the traditional method of visual appraisal of the animals
- ➤ Introduced record keeping on performance of animals
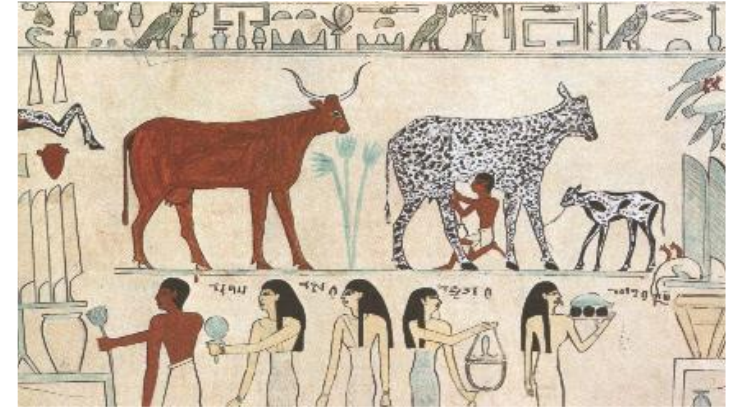- ➤ Developed the New Leicester sheep from the old Lincolnshire breed

Old Lincolnshire breed
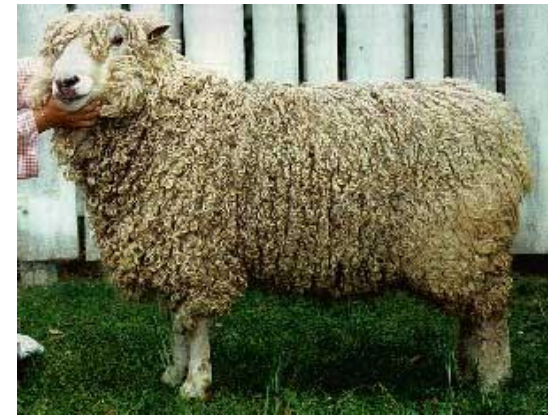
- The New Leicester had good quality fleece and a good fatty shoulder: popular at the time

Animal Breeding cont---

- Accelerated dramatically during last 100 years
- Massive progress in the last 50 yrs
- Well organized systems of genetic improvement in the livestock sectors

Herdbooks

- Official record of individuals and pedigrees of a recognized breed of livestock
- First herdbook: for thoroughbred horse established in England in 1791
- Shorthorn cattle (1822) were next to start a herdbook
- 1826 onwards for horses (in France), and from 1855 onwards for cattle (also in France)
- The first international herdbook was established for the American Berkshire pigs in 1876

Creation of breeds
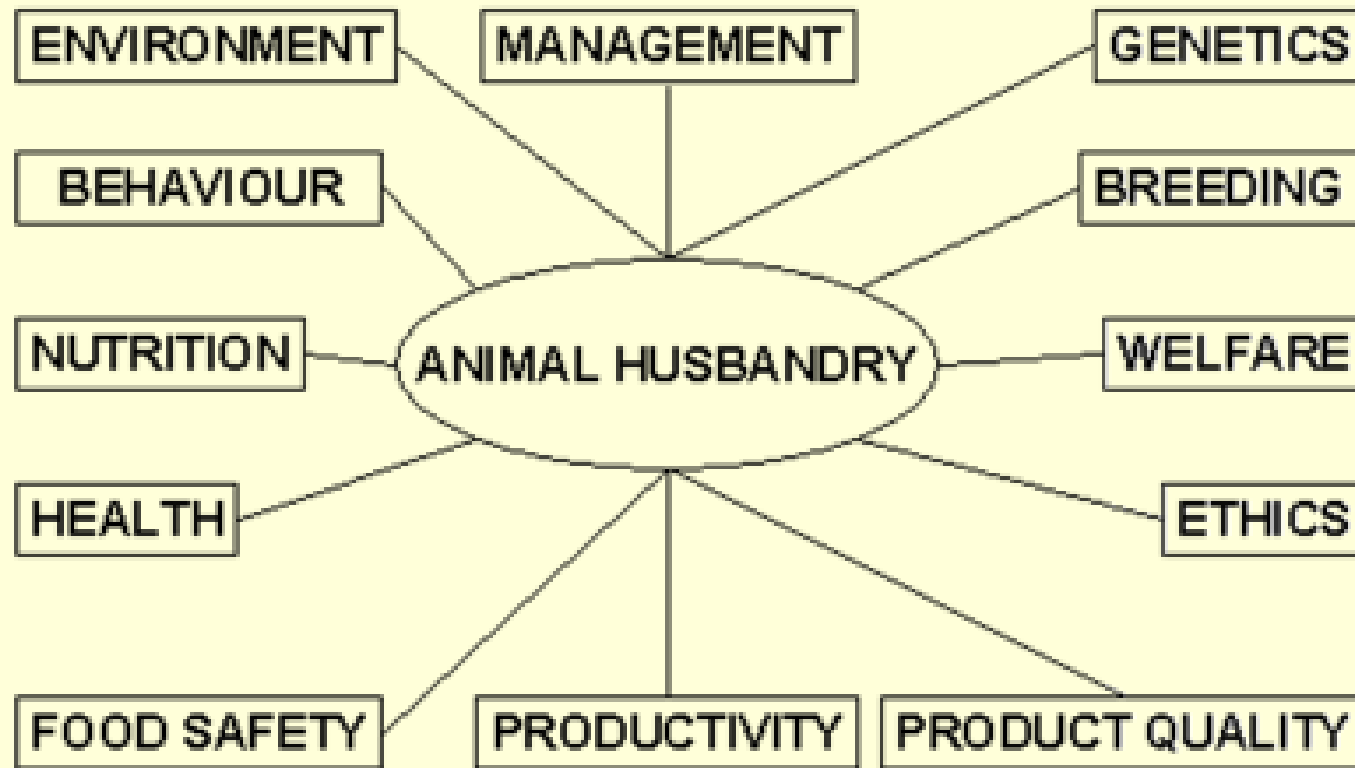- With the establishments of herdbooks, breeds were formed

Definitions
- A breed is a group of animals of a certain species that through generations of selective breeding has become uniform in performance, appearance, and selection history.

- A species is the largest group of animals that are capable of interbreeding and producing fertile offspring

Animal Performance/Production
- Genetics
- Environment
  - ➢ Nutrition
  - ➢ Housing
  - ➢ Disease events
  - ➢ Management practices

Components of Animal Husbandry

ENVIRONMENT MANAGEMENT GENETICS

BEHAVIOUR BREEDING

NUTRITION ANIMAL HUSBANDRY WELFARE

HEALTH ETHICS

FOOD SAFETY PRODUCTIVITY PRODUCT QUALITY

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Animal breeding

- Animal breeding aims at the improvement of animals by changing their genetic abilities for important traits

- Animal breeding is the process of selective mating of animals with desirable genetic traits, to maintain or enhance these traits in future generations.

- This involves estimation of the genetic value of individuals for traits;
  e.g. growth rate and yield of products such as eggs, milk or meat.
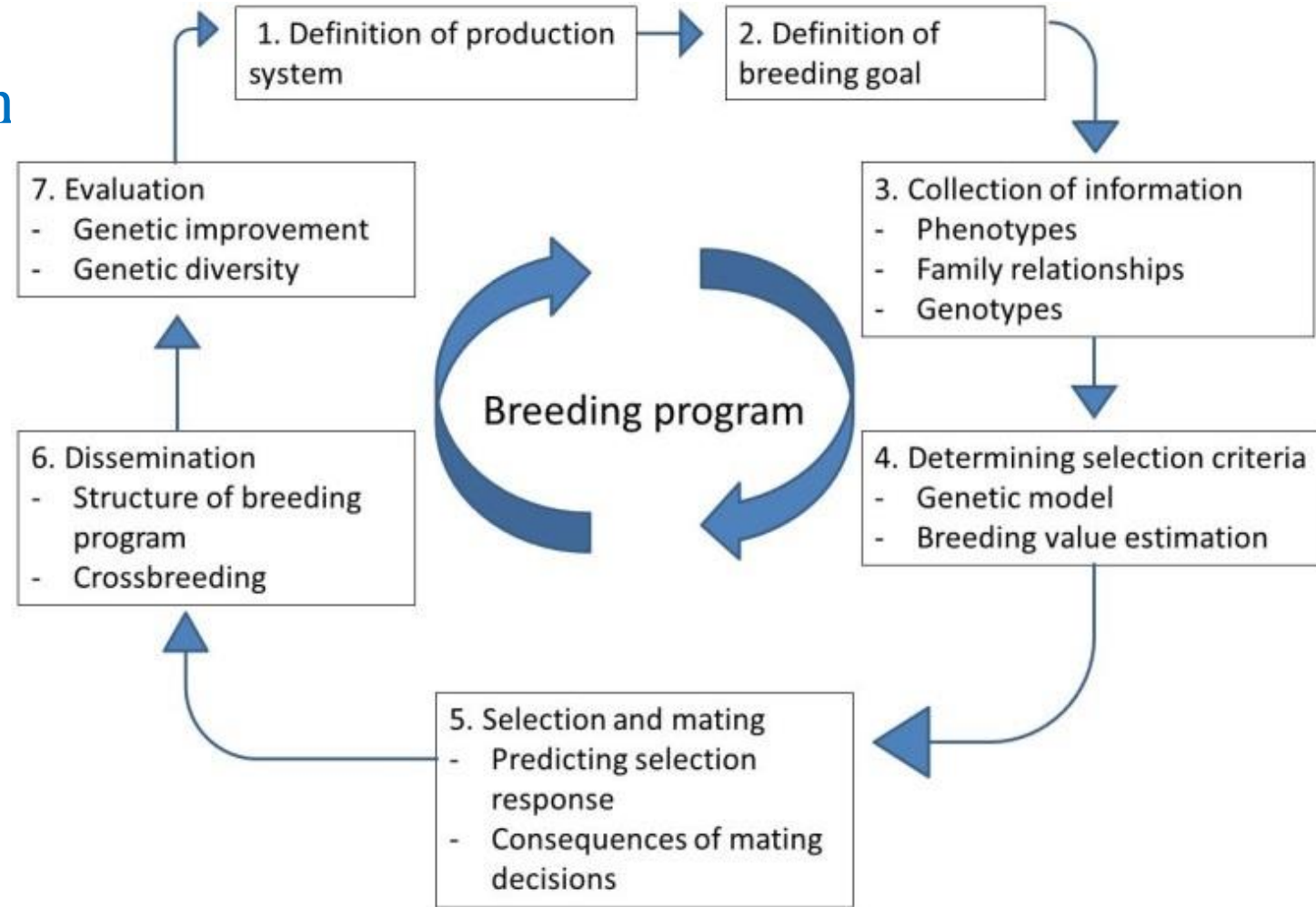
Objectives of Animal breeding

- Increased quality and quantity of yield e.g. milk, meat, egg, wool

- Higher growth rate of farm animals

- Better assimilation of reared animals

- Resistance to diseases

- Longer productive life

- Higher acceptable reproductive rate

A breeding goal

- is the specification of the traits to be improved
- the emphasis given to each trait
- It gives the direction in which we want to improve the population

A Breeding program

- is a program aiming at defined breeding objectives for the production of a next generation of animals.
- It is the combination of recording selected traits,
- the estimation of breeding values,
- the selection of potential parents and a mating programme for the selected parents including appropriate (artificial) reproduction methods.

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

Successful livestock breeding operation considers;

➤ Environmental

➤ Economical

➤ Technological factors

that affect breeding systems, breeding seasons, times of breeding, and methods of breeding.

Breeding systems

are a set of management practices that are used by producers to ensure the transmission of certain traits from parents to offspring

Just one breeding system or method of breeding livestock may not fit all producers.

Some systems may include grading-up, crossbreeding, purebred breeding, line-breeding, and inbreeding.

Factors to consider when determining which breeding system to use:
1. Climatic conditions,
2. Types of markets,
3. Knowledge of genetics,
4. Size of operation,
5. Personal preferences,
6. Available resources, and
7. Goals of the breeder.