

SYSTEMS OF BREEDING ECONOMIC TRAITS OF CATTLE AND BUFFALOES

LPM-601(Unit-III)

Lecture-1



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OBJECTIVES

- To know the economic traits of cattle and buffaloes.
- To know the system of breeding to improve economic traits of cattle and buffaloes.



INTRODUCTION

- Aim of the breeders: To evolve outstanding and improved dairy animals for maximum production.
 - Selection and system of breeding: Only tools available to the breeders for improvement of animals.
 - Since new genes can not be created but can be recombined into more desirable groupings.
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Systems of Breeding:

- 1. Inbreeding** (breeding of the related animals)
 - 2. Outbreeding** (breeding of the unrelated animals).
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1. Inbreeding

- Mating system in which individuals mated are more closely related than the average of the population.
- Related only when one or more ancestors in common on the first 4-6 generations.
- The intensity of inbreeding depends upon the degree of relationship.
- Makes more pairs of genes in the population homozygous.



Close inbreeding:

- Mating is made between very closely related individuals.
- Full brothers crossed with full sisters or offsprings crossed with parents.

Line breeding:

- Repeated back crossing to one outstanding ancestor.
- Matings are made to concentrate the inheritance of desired characters of some favoured individuals to bring the uniformity.



2. Outbreeding

- Mating of individuals less closely related as compared to the average relationship within the population.
- Increases the proportion of heterozygosity.
- A general increase in the mean of crossbreds called **heterosis or hybrid vigour**.
- Used to improve the performance of the progeny.



4 types of outbreeding:

- Outcrossing
 - Crossbreeding
 - Grading up
 - Species crossing
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Outcrossing:

- Mating of unrelated animals within the same breed.
 - Results in relatively few undesirable genes being fixed in the population.
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Crossbreeding:

- Mating of animals of different established breeds.
- Practiced to combine desirable characters from different breeds in the crosses for better overall productivity.
- Increase in the performance of crosses due to heterosis (Largest with the maximum genetic diversity).



Grading up:

- Mating of sires of a pure breed to non-descript females over generations.
- After 5-6 generations of mating to purebred sires, the graded animals will be similar to the purebred.
- Used for upgrading the non-descript buffaloes with Murrah.



Species crossing:

- Crossing of different species.
- Extreme form of outbreeding.
- **Catalo:** Crossing of cattle (*Bos taurus*) with American buffalo (*Bos bison*) to improve meat production.



THANKS