

ANIMAL GENETICS & BREEDING

UNIT - III

The Principles of Animal Breeding Theory

Methods of selection

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Methods of Selection

1. Single trait selection
2. Multiple trait selection
 - Success of raising animal depends on improvement in more than one trait.
 - Single trait selection can have unexpected and undesirable consequence due to genetic correlation and environment response.

- Simultaneous selection for many traits can be applied based on individuals own performance by adopting any of the procedure of selection. One may wish to adopt tandem selection or ICL methods or one may evaluate the individuals on the value for each of the traits selected for and then sum of these values to give a total value for all the traits. The animal with the highest score is then selected. These procedure are known as methods of selection

- 1. Tandem selection
- 2. Independent culling level (ICL)
- 3. Total score card method

1.Tandem selection

- In this method of individual selection the selection is practiced for one trait only at a time until a satisfactory improvement is achieved .
- The efficiency of this selection depends on the genetic correlation among the traits under selection.
- Limitations –
 - 1. This method is less efficient than other methods.
 - 2. It requires more time for improvement in all the traits

Independent culling level (ICL)

- This method of individual selection involves selection for two or more traits at a time.
- A minimum standard for each trait is fixed and every animal to be selected must meet the minimum standard fixed for any one of the trait will be rejected, irrespective of the fact that how good the animal was in other trait.
- **Advantage of ICL**
- 1. Selection for more than one trait.
- 2. Culling at early stage.

- **Disadvantage of ICL**
- 1.No compensations for other traits
- 2. Culling level- tedious job to decide CL
- 3.More emphasis to early expressed traits
- 4. Selection intensity

- ICL method of selection is used in selection of cattle for show purpose.
- The animal is selected with excellence of type, colour and conformation traits ignoring its performance for economic traits.
- Selection intensity under ICL:- . The selection intensity is decreased by selection for more than one trait. .
- The genetic correlations among traits also influences the selection intensity.
- selection intensity= $1/\sqrt{n}$
- n= no traits which are equally important and independent

3. Total score card/ Selection index

- In this method of mass selection , the selection is practiced for several traits simultaneously. But this method differ from ICL in that .
- The culling level are flexible. . .Each trait is weighted by a scores for individual traits are summed to a total score (index value) for each animal.
- Superiority in some trait can make up deficiency in other, unlike ICL which discards an animal; failing to qualify in one trait regardless of its superiority in other trait.

- Selection index over other methods of selection S.I. is a more efficient method of selection than others
- (1) It allows the individuals which are superior in some traits to be selected regardless of their inferiority in other traits
- (2) The advantage of index method increase with the no. of trait, thus it requires less time to bring about an overall improvement