

SELECTION OF HIGH QUALITY DAIRY ANIMALS (LPM-601)



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SELECTION OF HIGH QUALITY DAIRY ANIMALS

Objectives:

- To improve the performance of animals.
 - To improve growth rate, increased production of milk and meat.
 - To improve resistance to various diseases.
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Selection

- The process in which certain individuals in a population are given opportunity to produce offspring of desirable traits.
- Selection increases occurrence of desirable genes and decreases occurrence of undesirable genes.
- Selection pressure works better, when character or traits selected is not much influenced by environment but mainly by genetic make-up.
- The degree to which selection affects a character depends on the factors: Heritability of the character, intensity of selection, interval between generations and kind of selection being practiced.

Factors need to be consider before selecting Breeding Stock:

Age:

- Young animals.
- Should not calved more than 3-times.
- Should have a longer productive life.

Level of performance:

- Animals with highest production level selected.
- Performance best indicated by records.



Good performance of Dairy animal indicated by:

- High milk, Butter Content, Good mothering ability
- Calving interval
- Lactation Period
- The animals with poor performance should be culled.

Physical Fitness:

Animals selected should be free from any physical defect e.g.

- mono-eyed, limping,
- irregular number of teats, scrotal hernia,
- defective and weak backline.



Health

- Sick animals do not breed well and are expensive to keep.
- Animals that are resistant to diseases pass these characteristics to their offsprings.

Body Conformation

- Animals for breeding to be selected according to proper body conformation.
- A dairy cow should be wedge-shaped with a large udder, thin legs, long neck.

Temperament or Behaviour:

- Animals with bad behaviours should be culled. Ex. Cannibalism, aggressiveness, kicking.
- Docile animals (allow anybody to milk) should be selected.

Mothering Ability:

- Animals selected should have a good mothering ability.
- Animals with good natural instinct towards their young ones.

Adaptability:

- Animals selected should be well adapted to the prevailing climatic condition in the area e.g Arid and semi-arid areas.

BREEDS CHARACTERS OF HIGH YIELDING DAIRY COWS

- Attractive individuality with femininity, vigour, harmonious blending of all parts and impressive style.
- Animal should have wedge shaped appearance of body.
- The udder should be well attached to the abdomen.
- The skin of the udder should have a good network of blood vessels.
- All four quarters of the udder should be well demarcated with well placed teats.
- Teat should be about 2 inches long, cylindrical and placed squarely under each quarter.



CHOOSING TRAITS FOR SELECTION

- Aim of selection programme
 - Heritability of traits
 - Economic value of traits
 - Variation of expression of traits
 - Correlation among selected traits
 - Cost of selection programme
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METHODS OF MULTI-TRAIT SELECTION

Mass selection: Animals with superior characteristics are selected from a herd and then allowed to mate among each other at random.

Tandem method: Selection is practiced for only one trait at a time and the selection is continued till the desired character is achieved.

- This method has a drawback as achievement made in the first character in the first period is lost when attention is directed to another character unless the characters selected are genetically related i.e. if genetically negatively correlated characters will be taken into consideration, whole exercise will fail.



Independent culling method: A few characters are considered at a time and a maximum standard is set for each trait.

- Selected animals should meet minimum standard for each of the characters.

Selection Index: Each character depending upon the heritability (the ratio of additive genetic variance to total phenotypic variance) and the economic value is assigned a value.

- The total score given to the animal is based on these values.
- In dairy cattle, milk production which is most important character is given higher economic value than the reproductive efficiency. The score for each animal I , can be calculated as under:

$$I = b_1 x_1 \pm b_2 x_2 \pm \dots \pm b_n x_n$$

SELECTION CRITERIA

Individual selection: When the breeding value of an animal is estimated based on the phenotypic value of the trait of that animal to select it for future breeding, the criteria is called the individual selection.

- Applied to dairy cattle when cows are retained in herd on the basis of their records of production.

- Some disadvantages of individual selection are:
 - (i) When traits have low heritability, it is not effective.
 - (II) Sex limited traits like milk production.
 - (iii) when traits are expressed in later life of individual or after death of the animal.



Pedigree selection: The selection criteria based on the ancestors performance is called as the pedigree selection.

- Useful while selecting young female calves for milk production or young male calves to become future sires.
- As the pedigree selection is based on the records of ancestors, in addition to the individuals' own record, the efficiency decreases with increasing heritability of the trait and disappears when heritability reaches unity.



Progeny testing: The progeny of an individual is the index of parents genetic worth.

- This test prevents the breeder from being misled by environment and non-additive gene action.
- In this method, a group of progenies (offsprings) are used as an aid to increase accuracy in the selection of a breeding stock.
- This method is even used, when the character to be selected, is of low heritability and expressed by one sex only.

Selection using collateral relatives or Family selection: The procedure to estimate the breeding value of an individual on the basis of family mean is called the family selection.

- Collateral relatives include brothers, sisters, cousins, uncles etc.

General selection procedures for dairy animals

- Animal should be selected based upon-breed characters and milk producing ability.
- History sheet or pedigree sheet.
- Docile temperament.
- Selection should be carried out during first/second lactation.

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- Three successive complete milking has to be done and an average of it will give a fair idea regarding production by a particular animal.
 - Maximum yield is noticed till 90 days after calving.
 - A tortuous, big bulging and zig-zag milk vein is prominent in front of udder on both side of belly.
 - A dairy cow should have well proportionate head and neck, wide nostrils, prominent facial veins, large bright eyes and dewlap with gracious folds.



THANKS