

**Systems of breeding and methods of selection of dairy animals, Identification of male,
Body characteristic and correlation with milk productivity.**

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METHODS OF SELECTION OF DAIRY ANIMALS

Introduction

Selection is the tool in the hand of the breeder to improve the performance of the animal.

Methods of Selection

Selection is defined as a process in which certain individuals in a population are preferred over others for producing next generation. Selection does not create new genes, but it only increase frequency of desirable genes. Selection may be natural or artificial. Natural selection goes by time with nature. Man, aimed at improving genetic potential of farm animals, controls artificial selection.

(a) Individual selection

Selection on the basis of individual phenotypic performance is called individual selection. It is the most commonly used basis for improvement in livestock. Characters like body type, growth rate are evaluated directly from the individual animal performance. The limitations of individual selection are:

- 1) Some important traits like milk production, maternal abilities in cows are expressed only in females.
- 2) The performance records for milk and other maternal qualities are available only after sexual maturity is reached.
- 3) When the heritability of a trait is high, individual merit is a poor indicator of breeding value.

(b) Pedigree selection

Selection on the basis of performance of the ancestors is called as pedigree selection. Pedigree selection is very useful when the traits selected are highly heritable. If a performance record of individual is available, the addition of pedigree information usually adds little to accuracy of estimates of breeding value of individual. Pedigree selection is specially useful for early selection of individuals as in case of selection of young bulls for progeny testing. Limitation of pedigree selection is that the environment under which ancestor records were made

several years ago are quite different from the existing environmental conditions when an individual is evaluated for selection.

(c) Family selection

Family represents a group of animals having common genetic relationship. Generally full sibs and half sibs are the most common collateral relatives, whose records are often used to estimate the breeding value. When individual's performance is also included in calculating the sibs average performance, it is called family selection. Family selection is very useful in case of traits with low heritability.

(d) Progeny testing

Selection of the individuals on the basis of average performance of their progeny is called progeny testing. It is the estimation of an individual by evaluating its off springs. It is very useful tool in evaluating breeding worth of dairy cattle. It offers best means of achieving genetic improvement in traits of moderate to low heritability. The rate of progress achieved by this method is double to that possible by phenotypic selection. Progeny testing is generally used for selecting males as a large number of progeny can be obtained for each male, while the number of progeny produced by a female is limited. A major limitation of progeny testing is prolonged generation interval as individuals are to be selected only after their test progeny performance is evaluated. It is also very expensive since a large number of animals are to be performance recorded. For practical genetic consideration, the number of unselected daughters studied to evaluate a bull should be between 30 and 50.

(e) Unified score card system

The unified score card system (Table 1) gives a good index of Dairy confirmation of animals

Table 1 card system

A. General appearance : 18		
1	Size of animal- ideal to breed and age	3
2	Form of animal- symmetrical or stylish	2
3	Dairy character –lean ,angular	5
4	Skin quality-thin, pliable, hairs smooth, fine and soft	4
5	Temperament- active vigorous disposition and docile	4
B. Head and neck : 09		
6	Muzzle- wide nostrils and large	2
7	Face – clean cut , facial veins prominent.	1
8	Forehead- wide fine at poll	1
9	Horns- fine , typical of breed	1
10	Neck-Slender, medium length	1
11	Eyes- Large , bright prominent	1
12	Ears- Typical of breed size, well set	1
13	Dewlap- Thin, light, graceful folds	1
C. Fore-Quarters :07		
14	Withers-Clean refined , free from fleshiness	3
15	Shoulders- light oblique, well attached free from fleshiness	2
16	Legs-Straight, well apart, fine and smooth	2
D. Body :20		
17	Chest, wide, deep fore-flank full	6
18	Back-Straight, strong, vertebra, well defined	4
19	Lion- Broad strong , leveled, free from flesh	3
20	Ribs – wide apart and well sprung	6
21	Flanks- Thin, deep and full	1
E. Hind Quarters :12		
22	Hip bones- Prominent, and wide apart	2

23	Rump-Long, wide leveled.	3
24	Pin bones-Prominent ,and wide apart	2
25	Tail setting –Long fine, tapering.	1
26	Thigh- Thin, widely separated and incurving.	2
27	Hind legs- Straight carried well apart, fine shank.	2
F. Mammary Development :34		
28	Udder, (a) Shape	
	(i) Fore Udder: Full attached forward	5
	(ii) Rear Udder: Full Attached, high and wide	5
	(B) Symmetry: Quarters even balanced, floor of udder leveled	3
	(C) Capacity: Large, Texture, pliable, Free from fat and fibrous tissue	12
29	Teats: medium sized, squarely placed	4
30	Milk Veins: Long, Tortuous	3
31	Milk Wells: Large, numerous	2
	Total	100

Classify the cows based on Dairy type as follows

Grade Score

Excellent 90 and Above

Very Good 85 to 90

Good 80 to 85

Acceptable 70 to 80

Fair 60 to 70

Poor below 60

Animals scoring below 75 must be discarded.

(f) Body Condition Score (BCS) system

Body condition is defined as the ratio of the amount of fat to the amount of non-fatty matter in the body of the living animal. Body conditions are reflection of the fat reserves carried by the animal. The ability to estimate the body condition more accurately and relate it to milk and milk components production would help the farmers in the selection of dairy animals and to increase the overall efficiency of feeding and management of dairy animals.

It is helpful as a cheap tool for the selection of dairy animals. BCS was observed to be highly correlated with both body weight and heart girth. Cows with BCS above 3.5 had more heart girth which is a true indicative of health condition and productive performance. The cows of large frame size and measurements of physical parameters viz., wither height, hook height, intercostals space, heart girth and body weight did not receive high BCS indicating that assessment of the cows is based on body condition check points but not on body weight or frame size.