

TIPS FOR THE SELECTION AND CULLING OF COMMERCIAL DAIRY HEIFERS

Heifers form the foundation of a dairy farming enterprise as farmers can improve dairy herd by replacing 25-30% of cows with well-fed, healthy, and genetically superior two-year-old heifers.

Based upon efficient and timely monitoring, effective selection and culling decisions can be made prior to further investment for complete rearing of heifer to mature cow.

Heifer selection begins with marking those who are expected to meet the dairy herd's future goals through analyzing following parameters:

- Age and birth weights i.e. average daily gains till 150 days of age,
- Disease resistance
- Phenotype and structural integrity in the form of Body Condition Scoring (BCS)
- Genomic testing technology for in depth outlook of genetic potential of heifer



Later on, following important performance indicators help in culling decision:

- Age at first breeding
- Age at first calving,
- Milk production in first lactation
- Calving interval

The selection methods may be one or combination of following;

- Selection through Individual Performance Testing, i.e. to "keep the best and cull the poorest" based on quantitative trails.
- Selection through Pedigree record or information of an animal's ancestors which is valuable due to genetic transfer of traits from each parent.
- Show Ring Selection based on 'show ring performance'.
- Selection through Genomic Technology based on use of DNA¹ information of heifers to predict their performance at an early age. It analyses heifer's DNA based on the genes inherited from both parents.

Genomics data is generated using DNA and genomic equations which starts with collecting a blood sample, hair sample or tissue sample. The sample is collected from the skin, blood or hair samples of the heifers with the help of special tools.

Genomic selection allows better selection of dairy heifers based on their genotype within the herd rather than relying on phenotypic assessment alone. This technology is becoming widespread enabling farmers to breed cattle according to breeding goals e.g. breeding for higher milk yield. Its appropriate use may lead to significant increase in herd productivity, health, welfare, short generation interval and increased genetic improvement. By testing young heifers rather than the older ones, poorer genetic gains can be removed from breeding regimes resulting in faster genetic gain in superior heifers. Considering the cost implications for rearing heifers, significant savings can be achieved by selling or culling the poorest heifers.

The cost associated with genomic testing is around 25-70 US\$ per test, depending upon the testing of required traits. Currently, the labs in USA, Australia, Germany and Netherlands have the facility of genomic testing as well as screening for genetic abnormalities. Genomics testing is the best way of genetics improvement of the dairy herds with 85% accuracy in the shortest possible time. The cost associated may be reduced significantly by improving economies of scale and establishing genomic testing labs in Pakistan.

Some suggestions to improve efficiency of heifers are:

- The heifers should be ear-tagged with information of heifers such as breed, age, date of birth/purchase, weight etc.
- The housing should facilitate easy drainage and removal of dung, urine and waste material.
- Apparent (or feels like) temperature of shed not exceeding from 27°C.
- Minimum sun exposure with axis of length to be east to west.
- Supply adequate feeding and watering as per nutritional standards round the clock.
- Keep accurate breeding records of dates of heat, service and parturition. Use records in predicting the dates of heat and observe the females carefully for heat.
- Breed heifers during/near the end of mid heat or heat period. Veterinarian should examine if not settled after these services.
- Follow disease prevention program, test and vaccination for diseases affecting reproduction and general health of heifers. Keep vaccination and medication record.

¹DNA stands for Deoxyribo Nucleic Acid which is a molecule that contains the genetic code of an organisms.