

Recent Genetic, Breeding and Biotechnology Techniques for Improving Livestock Production

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Editorial

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Editorial

Techniques of modern biology such as molecular cloning of genes, gene transfer and genetic manipulation of animal are a truth today and are finding their ways into research and development programmes. We need to stay abreast of new techniques because the practice of livestock breeding changes with advances in technology. We modified the way we measure and evaluate animals as we came to understand Mendelian mechanisms and as we developed statistical procedures for dealing with quantitative traits. Biotechnology is offering extraordinary opportunities for increasing livestock production. The significance of biotechnology and its significance are only gradually being accepted. Biotechnology is not new. The Man has used it for thousands of years. These have better possibilities for manipulating biological systems for the advantage of mankind. The intention of this chapter is to review available biotechnology and other technologies with potential application in livestock improvement and to identify those, which have been or may be applied.

In the last half of the twentieth century, biologist has entered what some scientists have referred to as its Golden Age. We need to stay abreast of new techniques because the practice of livestock breeding changes with advances in technology. We modified the way we measure and evaluate animals as we came to understand Mendelian mechanisms and as we developed statistical procedures for dealing with quantitative traits. Presently there is an enormous investment in sequencing livestock genomes and the use of genetic markers to assist selection of the QTL is referred to as Marker Assisted Selection (MAS). Technologies for the analysis of DNA are

constantly advancing. Microarray chips are at present available for cattle that permit for the simultaneous analysis of tens of thousands genetic markers. This technology has opened the entrance to genomic selection. Research and development of tools to evaluate DNA, RNA and proteins continue at a rapid rate. These novel tools should be assessed on a regular basis to ascertain that they can provide benefit to genetic improvement.

Now we are entering a new era, the era of biotechnology. It is an era of immense promise, yet there is little agreement on how biotechnology will influence animal breeding in the future. Biotechnology can be generally defined as the application of biological knowledge to practical needs. Molecular technologies can be utilized to locate, identify, compare, or otherwise manipulate gene. These consist of techniques such as DNA fingerprinting, genetic engineering, DNA cloning, gene mapping, DNA sequencing, DNA microarray, gene transfer etc. Animals provide the milk, meat, fibre and drought power need of the human beings. Molecular markers are used in genetic diversity studies. The preferred markers for these studies are primarily microsatellites. Molecular markers provide new opportunities to hasten selection of economic traits or to select for new traits that are costly and difficult to measure in farm animals and to improve animal production and productivity. The potential availability of a large number of single nucleotide polymorphism markers and high throughput technology for these markers will direct to a shift to SNP markers in near future. The possibility to augment rates of genetic improvement by using molecular marker evidently exists. The full understanding of this prospective will necessitate

infrastructure and knowledge. Additionally, it must be cautiously targeted to offer best returns to breeding organizations and farmers. The use of biotechnology in this area, in growing production effectiveness through

manipulation and control of physiological systems and improving the health and well-being of animals, imagine vast importance.

