

Application of Genetic Markers in Animal Breeding

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DESCRIPTION

The farming of animals in its conventional form depends largely on the phenotypic selection of an animal with a superior characteristic within the segregated populations derived from crosses. Other technologies, such as artificial insemination, multiple ovulation and transfer of assisted reproduction embryos have been used; there has been a significant change in productivity of selective breeding animals. However, in this practice, there are so many obstacles, especially in relation to genotype X environment interactions. Conventional reproduction strategies in zoo technical production consume most of the time and do not consider all the sources of genetic variability efficiently. Similarly, in those strokes that are sexual characteristics, humility from tomb or literacy, the effect of conventional reproduction is limited and, in most cases, the techniques used in phenotype selection are usually expensive. In order to improve the animal breeding program, therefore it is important to balance molecular genetic techniques with conventional animal breeding techniques.

Recent progress in the field of molecular biology and molecular technology has allowed revealing a large number of genetic polymorphisms at DNA level. As such, scientists and researchers use them as trust markers in order to determine the genetic bases of the observed phenotypic variability. The unique genetic attributes, as well as the methodological merits of genetic markers, essentially susceptible to do and, to a greater extent, for scientific research that is linked to genetics compared to other genetic markers. In terms of direct application, these DNA markers covered a wide range of some of which include: Estimate of genetic distance, the determination of double zygosity and free martinism, the determination of paternity, genetic mapping, sexual of pre-implantation and of Identification of the injured embryos of the disease. Molecular markers can be used simply as reference points in transgenic reproduction and aiming for animals with specific transgenes. Different types of molecular indicators, such as polymorphisms

of the length of the restriction fragment, microsatellite and polymorphisms of a single nucleotide, have been widely used in molecular reproduction, since they can be easily amplified through the reaction of the polymerase chain and could be used to estimate the Genetic diversity inside or between breeding. Populations therefore, the general improvement of bovine species is highly reached by the application of molecular markers.

Applications

1. Molecular markers have a revolutionized agricultural science, including reproduction and genetics of animals specifically.
2. The genetic DNA polymorphism led to the discovery of different marker techniques with a series of applications in reproduction of applied cattle. However, the use of these markers for cattle genetic research is largely based on the optimal selection of an adequate marker technique for a specific application.
3. Molecular markers compared to conventional animal farming techniques, offer more accurate genetic information and better knowledge of animal genetic resources.
4. These markers have a great potential for breeding programmers of Nigerian cattle. However, several bottlenecks, such as lacking infrastructures, suitable, inadequate capabilities and operational support, the lack of a qualification policy, the legal and regulatory framework at national level, which in turn influences research institutions, could be the main reasons that prevent the adequate adoption of these techniques.
5. In the near future, it is expected that the development of the molecular marker will continue enormously in developing countries such as Nigeria, in order to serve as an underlying tool for geneticists and breeders who will be useful in the production of animals with desirable traits for human use.

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