

CROSS BREEDING OF INDIAN CATTLE - FACTS, SPECULATIONS AND OPINION

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Extensive Cross Breeding Programme was launched on Indian Cattle in the early seventies. Prior to these Sindhi bulls were used to upgrade the non-descriptive cattle in Kerala. In 1962, Jersey breed was introduced for grading up the local cattle population. Later on the Government of Kerala in collaboration with the Government of Switzerland launched Indo-Swiss Project carrying out a large scale cross breeding with Brown Swiss breed and finally evolving a variety of milch cow named Sunandhini. But unfortunately in the subsequent years production potential of Sunandhini cows were questioned by the farmers as it did not show a persistency in milk production. Later the temperate breeds like Jersey and Holstein Friesian (HF) were introduced, but the breeding programme failed to give the expected result. This may be due to the unplanned breeding and other reasons.

The Indian Scenario

Meanwhile, the Government of India (Indian Council of Agricultural Research, ICAR) started cross breeding of cattle under "All India Co-ordinated Research Project on Cattle (AICRP)" with seven centres in different parts of the country. The Indian breeds like Gir, Haryana, Ongole, etc. were used as foundation stock and the temperate breeds like Jersey, Brown Swiss and HF were used to produce 3 breed crosses having an inheritance of 25% local breed and 25% and 50% inheritance two exotic breeds mentioned above. So every centre produced four lines of 3-breed cross having above mentioned genetic structure incorporating the local and 3 exotic breeds. According to the breeding policy of AICRP on Cattle these 3-breed combinations were evaluated and based on this inter-se-mating (mating between cross breeds having similar combinations of local and exotic blood) was carried out within 3-breed combination and between the different 3-breed combinations to bring together the desired qualities

observed in different lines.

Up to the production of 3-breed combination, these centres had many success stories in attaining the desired results in the different line combination with respect to quantity of milk produced, SNF, fat content and reproduction performance. But with the introduction of inter-se-mating the progenies failed to maintain the qualities of parental line and started showing much variation in production performance even among progenies of the same parents. So the vast variation in production performance showed by the progenies of the same parents indicated the unreliability of the parents in respect to their genetic transmitting ability.

The myth about crossbreds

White cattle have got 30 pairs (60) of chromosome in their cell. The genes present in the chromosome govern all the activities of the body including growth, milk production and other economic characters. In a pure breed chromosomes present in one pair will be almost similar and identical (homozygous). By cross breeding, one chromosome in a pair will be replaced by a different chromosome (heterozygous) from another breed. During spermatogenesis, a sample half of the genome/ one chromosome from each pair will be transmitted to each spermatozoa. When we think of the gamete formation of an individual having 50% gene of an exotic breed and 50% gene of local breed, many variations could occur. Millions of sperms are produced at a time by the division of germ cells, hence the chance of spermatozoa getting chromosomes of different breeds vary. There is a rare chance that one spermatozoon get all the 30 chromosome of the exotic breed in it by chance. Then the second spermatozoa produced by the same germ cell may get all the 30 chromosome of the local breed. These are the two extremities of probability that spermatozoa get different proportion

of gene of the two breeds in question. All the other sperms produced by that individual will get genes of varying proportions from these two breeds ranging between these two extremities. The same variation is also applicable to the female cross-bred parents producing the ova. By crossing two 50% cross-bred, the chance of inheritance of progeny is the same as spermatozoa/ ova possessing different proportion inheritance of these two breeds. Hence there are chances for the progeny of 50% cross parents to be a pure local one or a pure exotic one or any combination having different proportion of inheritance of these two breeds. So the production performance of the progeny depends on the chance that which sperm of the individual fertilize which ova and not the merit of the parent. This fact holds the cross-bred parent unreliable for their ability to transmit their production characters to their progeny. That means they lost their prepotency (the ability to produce uniform progenies) as they are heterozygous in their gene structure. So in such animals, as they lost the prepotency, the progeny testing of such bulls for performance evaluation and a selection of bulls based on performance of its progeny for the improvement of future generation become impossible. The claim of different agencies that they have progeny tested their cross-bred bulls and selected as premium bulls being used for so called improvement of future generations is beyond our level of understanding.

Genetic potential of Indian breeds

In India, we claim to have eighty one thousand types of lives belonging to different species, classes under animal kingdom. No other nation possesses such a large biodiversity in animal kingdom. More than 27 definite breeds of cattle originated in different parts of the undivided India, varying in production performance, size and body conformation. Though the average production of these animals are not comparable with many exotic breeds at present, they were reared in different farms with encouraging results and these breeds produced at an average of about 8 to 15 kilogram milk per day. Moreover, there are some individual records of around 30Kg. per day especially from breeds like Sindhi, Sahiwal, Tharparkar, etc. This shows the upper limit of genetic potentiality of the breeds for such a high production

and by selection, improvement of these breeds average production could be increased to somewhere near 60 % to 70% of the high individual records. The genetic gain per generation or per year may be low but the improvement achieved by selection in the pure breed is a permanent gain. Considering the above facts, we should rethink about the justification for introducing temperate breeds for enhancing the production level of native animals.

Advantages of local breeds over exotic

In this context, we should have a basic idea about how a breed originates in a locality. India is a tropical country with variations in tropical climatic condition existing through out the country except in some pockets. The breeds which have originated in different parts of the country have differences in body size, conformation, production capabilities etc. but have similarity in traits within breeds. Thus the different breeds originated in almost similar environmental conditions differ in body character and production. It is supposed that all cattle breeds have originated in different localities from the old primitive wild cattle. Depending upon the climate, availability of feed materials and other environmental conditions, they underwent certain modifications in their physical structure and production level according to the prevailing conditions of that locality they happened to be stationed. Those animals capable of getting adapted to the above said prevailing conditions in that locality could only survive and propagate by reproduction. Others will be automatically expelled from the breeding population by natural selection. Those adapted animals will develop uniform characteristics in due course and develop into a "breed" of that locality. And this breed arose to be the best one to be reared in homestead farming condition in that locality. It doesn't mean that we cannot rear other tropical climatic breeds in that locality, but depending upon the performance level, necessary alterations have to be made in the management practices. Now considering the adaptation and production potentials of different breeds of cattle originated in India, the thought of introducing a breed originated or synthesized in an area where the climatic conditions are just opposite (temperate region) and where the socio-economic

system is also entirely different, is a matter of concern. In temperate breeds, their body is so developed for conservation of heat as the atmospheric temperature is very low than the body temperature. But in tropical animals, the body structure helps them to dissipate the heat produced in the body for regulating the body temperature. For this reason, survival and performance of temperate breed, pure or cross, is so difficult because their body conformation doesn't suit to withstand tropical climate, which will provide a continuous stress for these animals and their performance. Thus their health condition will also be deteriorated.

Based on this knowledge, the Scientists thought of importing semen of temperate climate breeds to cross the Indian cattle, so that they can produce a complementary breed, which can resist the tropical climate and give high milk yield. But the last 40 to 45 years of experience of cross breeding, clearly revealed the fact that the resistance to tropical climate and high milk production cannot co-exist in an animal which inherit exotic blood because both causes additional stress to the cow.

Conclusion

In short, selection in cross breeds is ineffective. To improve the production potential of our animals, we should go for selection of Indian pure breed dairy cattle and its propagation, also encouraging buffalo farming and their selection, thus improving the milk production of this country. Interestingly majority of

us think that our dairy cattle are inferior in production performance to the temperate breeds but this is not true. In fact, no honest effort has been made to subject the Indian cattle for judicious scientific selection and improvement of their production capability. Instead we have adopted a short cut method of crossing with exotic breed which gave only a temporary boost in production. A recent observation made by the F.A.O. (Food and Agricultural Organization) based on a study report says that, Brazil is the country who export Indian breeds of cattle after selection and improvement to a level that now they are superior to established European breeds. This clearly reveals the negligence of Indian Scientists to develop native breeds to a level capable of competing with any established European breed under the false impression that whatever locally available is inferior. From this what one could understand is that "Though India secured its independence 60 years back, mentally we are yet to be freed to enable us to think freely as Indian and recognize the value of things around us and thereby feel proud to be an Indian."

References

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