Choudhary Publishing Media

Indian Journal of Livestock, Veterinary and Animal Sciences
Volume 2 Issue 2; 2022
eISSN: 2582 9920

Innovative Methods in Animal Breeding and Management for Productivity Enhancement

R. S. Choudhary
Department of Animal Husbandry and Dairying,
Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, (U.P.) India

ABSTRACT

A group of animals related by descent and similar in most characters like general appearance, features, size, configuration, etc. are said to belong to a 'breed'. Animal breeding is producing improved breeds of domesticated animals by improving their geno-types through selective mating. With the ever-increasing population, the requirement for nutritious food has risen steeply across the world. Since time immemorial, animals have been an integral part of agriculture. They have been used to derive milk, meat, eggs, wool, silk, for labour, etc. As animals are so crucial part of agriculture, they require proper care and management. According to some estimates, more than 70% of the world's total livestock population is in India and China. However, their contribution to the world farm produce is only 25%. This means that productivity per unit is very low. This led to the concept of animal husbandry where a more scientific approach to caring for and breeding farm animals is provided.

INTRODUCTION

Various breed improvement programme in our country must form co-ordinating bodies for monitoring the quality germplasm production, performance recording, evaluation and selection of young bulls and testing their genetic merit both at organized herds including progressive gaushalas maintaining indigenous breeds and farmers' herds under field conditions [1]. Faster multiplication of superior germplasm by selected organized breeding herds through adoption of open nucleus breeding system with emerging artificial reproductive techniques is needed. For developing breeding strategies for improving the productivity of different types of farm animal populations in different regions of the country as well as with different socio-economic levels of farmers, various animal breeding technologies developed (AI, ETT, Sexed Semen and Embryos *etc*.) need to be used on large scale by developmental organizations for proper implementation of genetic improvement and development programmes particularly on farmer herds [2].

Objectives

1) Improved growth rate,
2) Increased production of milk, meat, egg, wool, etc.,
3) Superior quality of milk, meat, eggs, wool, etc.,
4) Improved resistance to various diseases,
5) Increased productive life, and
6) Increased or, at least, acceptable reproduction rate.

Nutrition

The nutritional needs of farm animals with respect to energy, protein, minerals and vitamins have long been known, and these have been refined in recent decades. Various requirement determination systems exist in different countries for ruminants and non-ruminants, which

were originally designed to assess the nutritional and productive consequences of different feeds for the animal once intake was known. The potential of such feeds is largely unknown. Given the prevalence of mixed crop-livestock systems in our country, closer integration of crops and livestock in such systems can give rise to increased productivity and increased soil fertility. Due to crop residue-based feeding, addressing the nutritional constraints faced in the country is extremely difficult. Scarcity of green fodder is great challenge for livestock sector in India [3].

Dry Fodder

Animals can thrive on dry fodder for long and productive animals need concentrate and green fodder as additional supplements. Indian dairy industry is crop by- product based. Diversion of agricultural wastes such as straw, groundnut shell powder, cotton stalks as fuel, for paper and briquetting industries should be withheld and these must be conserved for animal feeding. Forest Departments should help dairy farmers in droughts/floods by supplying grass bales at subsidized rate. *Feeding, watering and devices*: Feeding and watering are labor intensive and hence not performed as warranted. Frequent feeding and watering are two cardinal areas for improving appetite, increasing DMI and thereby enhancing productivity of animals. A small water tank for round the clock availability of water and a portable manager for feeding are required for 2-3 livestock owing farmers. Cool water in summer and warm water in winter enhances water intake and milk production [4].

Disease

Animal diseases generate a wide range of biophysical and socio-economic impacts that may be both direct and indirect, and may vary from localized to global. The economic impacts of diseases are increasingly difficult to quantify, largely because of the complexity of the effects that they may have, but they may be enormous. Climate change may have impacts not only on the distribution of disease vectors [4].

Common Animal Diseases

Anthrax, Black quarter (black-leg), Foot and mouth disease, Mastitis, Foot rot, Bovine babesiosis (tick fever) are the major diseases [4].

Metabolic Diseases

Dairy animals, due to their high yielding nature are likely to suffer from metabolic diseases. These are milk fever, ketosis, post parturient haemoglobin urea and hypomagneshimia. Milk fever: There is no fever in this disease. This disease is seen mostly during the period of one week before calving to a week after calving.

Ketosis: In high yielding animals' deficiency of stored energy results in utilising body fact. While energy is available in this process, certain other products such as Ketone bodies (keto acids) are formed. The disease usually occurs during the peak yield phase [5].

Some of the critical areas that need concern at dairy farm are

Housing: It is almost absent and livestock are tied to trees and sheep and goat are kept in open pens. Cheap housing can be erected with elevated floors and some kind of roof over. Comfortable floor space with required bedding and housing ameliorates stress. Plantation of shade providing trees around roof and paddock has been a good option in tropical climate.

Thatched roofs are also a good option. There is no thumb rule for housing, but a comfortable house will provide ideal conditions for the living of the animals [5].

Silent heat in buffaloes: Buffaloes contribute 55% of Indian milk production in spite of their being silent breeders during peak stress season. Ponds, wetting, splashing, fogging, misting are provided to buffaloes on organized farms in Punjab and Haryana but a wallowing pond is a simple answer to reduce body heat of buffaloes. Providing shade by means of trees additionally breaks photoperiod signals by 2-3 hrs during peak noon results in exhibiting signs of estrus more prominently.

Conception rate (CR): Artificial Insemination Worker (AIW) knowledge and inherent attitude are the key factors for variation in CR. Thorough rectal examination of cow alone before attempting to load AI gun will reduce number of AIs carried out by the inseminator drastically and undesired impact on economics of breeding program by simultaneously reducing precious semen utilization and intrauterine infections [5].

Livestock Density on a farm: Excess livestock (Calves, heifers, dry cows, infertile and senile animals, bullocks, disabled) become constant disturbing factor on other productive animals and economics of farm. Efficient culling is not possible due to religious sentiments in the country, as culled animals invariably find their way to slaughter houses. Sexing of semen for insemination is another option to obtain desired progenies, but sexed semen is not available on large scale. Till then the best principle is, ***"keep few animals and breed the few with the superior animal"***.

Faster Milking: Cow yields maximum when she enjoys milking. Importance of faster milking (6- 7minutes) is well known [6].

Challenge of Mastitis: With huge crossbred population dotting dairy industry, mastitis is one of the most economically important disease of cows. It is not very common in goats, sheep, camels and grazing herds of indigenous cows and buffaloes, as these animals generally do not sit after milking and their teat canal get sufficient time to seal restricting passage of disease-causing microbes through it.

Future Challenges for Livestock Sector

Competition for Natural Resources

Land: In the more arid–semiarid areas, livestock are a key mechanism for managing risk, but population increases are fragmenting rangelands in many places, making it increasingly difficult for pastoralists to gain access to the feed and water resources that they have traditionally been able to access.

The mixed crop–livestock systems will continue to be critical to future food security, as two-thirds of the global population live in these systems.

Water: Globally, freshwater resources are relatively scarce, amounting to only 2.5 per cent of all water resources. Groundwater also plays an important role in water supply: between 1.5 and 3 billion people depend on groundwater for drinking, and in some regions water tables are declining unremittingly. By 2025, 64 per cent of the world's population will live in water-stressed basins, compared with 38 per cent today. Increasing livestock numbers in the future will clearly add to the demand for water, particularly in the production of livestock feed.

Climate Change

Livestock food chains are also major contributors to greenhouse gas emissions, accounting for perhaps 18 per cent of total anthropogenic emissions. An increased amount of GHG generates high temperatures on earth. The most abundant GHG are water vapor, carbon dioxide, methane, nitrous oxide and ozone [7]. However, the amount of GHG that agriculture and farming produce around the world is different because each livestock production system is different in the way it uses resources. Livestock constituted 63.4% of the total GHG emissions from agriculture in India. Livestock production is the largest methane source emitter in the world. Most of this methane is a result of manure storage and enteric fermentation, which is methane produced in the digestive tract of an animal. Ruminants (dairy, beef, goats, and sheep) are the main contributors to CH4 production. Many factors influence ruminant CH4 production, including level of intake, type and quality of feeds, energy consumption, animal size, growth rate, level of production, and environmental temperature etc. The methane emissions in dairy cows represent values from 151 to 497 gm per day. Lactating cows produced more CH4 (354 gm/day) than dry cows (269 gm/day) and heifers (223 gm/day). Systematic management of manure from livestock is not practised in India. Manure is mainly converted into dung cakes and used for energy in rural areas. It is estimated that about 0.114 mn tons of CH4 and 0.07 thousand tons of N20 are emitted from this source. It may conclude that we all should have a responsibility to keep the earth clean and use fewer resources. By the proper management of livestock industry, it can be improving to reduce carbon emissions and conserve resources in our country.

REFERENCES

1) Alderson, L. (ED.), 1990. Genetic Conservation of Domestic Livestock.
2) Wallingford, UK, CAB International.
3) Darwin Ch., On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life, 1859, p. 109.
4) www.science-times.org/origin-of-species-chaper
5) Hutu I., 2015, Farm Animal Productions, Course for Veterinarians in Animal Production and Husbandry, Ed Mirton, Timisoara.
6) Marks, H.L., 1996. Long-Term Selection for Body Weight in Japanese Quail Under Different Environments, Poultry Science 75:1198-1203.
7) Oldenbroek, K, 2007, Utilization and conservation of farm animal genetic resources. Wageningen Academic Publishers, Nederland.