

Beef Production

The beef production systems practiced in Kenya includes

- Nomadic Pastoralism
- Ranching
- Agro-pastoralism
- Feedlot system

Nomadic Pastoralism

Nomadic pastoralism involves a seasonal pattern of movement around a more or less regular pattern. It is the most environmentally sustainable livelihood in the arid and semi arid areas. This system is practiced predominantly in Northern Kenya and southern rangelands.

Ranching

Ranching is a form of beef production system practiced within a defined unit of land. In a ranch it is possible to maintain optimal stocking rates conserve, and preserve pasture and develop livestock support facilities such as dips and water points. This system is practiced in both arid and semi arid areas

Agro-Pastoralism

This is a production system practiced in semi- arid parts of the country where beef farming is practiced alongside crop farming. Beef farming and crop farming complement each other through livestock feeding on crop residues and crop farming benefiting from manure and animal draught power.

Feedlot system

These are units where immature are intensively put on a feeding regime purposely to fatten so as to attain a specific market weight prior to being sold. The animals are confined like in the zero grazing units in dairy production and are fed on high-energy concentrates. This system is not in use in the arid lands of Kenya.

General Management of the Beef Herd

i. Breeding

Breeding involves the selection of highly performing animals in the herd and introducing superior qualities/characteristics into the herd for the purpose of increased production.

Cattle production in the ASAL areas is free range, often in communal grazing and shared water points. In order to improve the herd productivity, it is important that livestock keepers control and manage the breeding calendar.

Breeding records:

In order to make decisions on breeding the most important prerequisite would be keeping records of the animals involved. The following are some of the important records.

(a) Pedigree Records

These are records that trace the lineage of an animal both parents.

(b) Performance Records

These records reflect an animal's performance in their lifetime.

Breeding plan:

Improvement of beef cattle by selection Animals can be improved significantly by selecting superior traits within the herd and multiplying them so as to preserve them.

Population Size

This is important because it determines the intensity of selection. The higher the population from which the selection is to be done, the higher the section intensity, hence the higher their genetic gain per unit time.

Generation Interval

This is the age of the parents at the birth of their first calf. The smaller the generation interval, the higher the genetic gain within a given time.

In order to maximize economic gains in the selection programme, the management levels of the herd should be optimal. This will reduce the environmental variances, which suppress the expression of the genotype.

Selection of the Bull

The bull to be selected should have the following qualities:

- ❖ Be from a good dam and sire,
- ❖ Have evenly placed teats and well hanging testicles.
- ❖ Not related to cows in the herd to avoid inbreeding.
- ❖ Have good conformation for beef production.

- ❖ Free from any deformity

Selection of the Cow:

The selected cow should be –

- ❖ Fertile
- ❖ Regular breeder, which give birth to live calves.
- ❖ Good milk producer and the udder should be well developed,
- ❖ Docile and easy to handle.

Selection of replacement Heifers:

Replacement heifers should be selected before final culling is done. Heifer selection can occur at different stages in its early production life, which include weaning, yearling, breeding, pregnancy, and after weaning of the first calf.

Culling of Cows:

Culling should be done in order to enhance the genetic progress in the herd.

Improvement through Crossbreeding

This is where a bull and a cow mated are of different breeds. A superior bull is used to upgrade the herd. It results in hybrid vigour where the crossbreeds' performance is more than the average of the dam and the sire, Traits of importance include: Faster growth, Ability to reproduce fast, High milk production, Good carcass quality and Disease resistance.

In beef production, Boran is the desired breed because of its good carcass quality, fast growth rate and reproduction while the Sahiwal are desired for both milk and beef production.

When to Breed

Heifers are best served when they are about 2 $\frac{1}{2}$ years old or a better indicator is when they are $\frac{3}{4}$ of their expected adult weight. The best time to breed is during the rain season when there is plenty of nutritious forage when the bulls and cows are more healthy and fertile.

Onset of Heat

The period from the beginning of one heat to the beginning of the next varies from 18-24 days with an average of 21 days. Mating occurs when cows on heat are grazed together with bulls. Approximately $\frac{2}{3}$ of all heats occur between 6 p.m and 6 a.m, i.e. during evening night and

early morning. Silent heat may occur due to stress. A bull will help reveal a cow in silent heat. If cows do not have a bull to detect heat it will be necessary to observe the following signs of heat.

- ❖ A cow on heat is receptive to the bull
- ❖ Bellowing, Restlessness,
- ❖ Milk production may fall,
- ❖ Mounting others or allowing to be mounted.
- ❖ Clear mucous discharge from the vulva,
- ❖ Pink swollen vulva

Pregnancy Determination

In a beef production operation, it is economically feasible to determine pregnancy in heifers and cows prior to their anticipated time of calving.

Factors affecting pregnancy rates

- ❖ Heifers typically have a longer heat cycle than cows.
- ❖ Body condition affects length of postpartum interval.
- ❖ Extreme calving difficult and delayed assistance will extend the heat cycle (postpartum).

Length of breeding season depends on the following:

- Bull libido, diseases and condition ,
- Genetic factors e.g. crossbred dams reach puberty earlier and have higher conception rates.
- Phosphorous deficiency
- Calving

When assisting a cow during difficult calving the following guidelines may be necessary

- Confine and restrain the cow.
- Check the amount of lubrication on the birth canal and if dry lubricate with soapy water.
- If the delivered calf is not breathing, remove the mucous and membranes from the mouth and nose.

- If there are abnormalities and the cow has been attempting to calve for 6-8 hours contact a vet. The after birth is usually discharged after 24 hours.
- If the calf is coughing, there may be liquid in the lungs, hold the calf upside down to drain it. Blowing gently into the mouth and nostrils may stimulate breathing or it may be necessary to slap the calf gently on the chest over the heart.
- Allow the calf to suckle colostrum to acquire antibodies.

Reduction of calf losses

Calf loss from death can be drastically reduced by implementing management and calving techniques in the areas of

- Improved calving facilities.
- Improved sanitation.
- Treatment of sick calves.
- Closer observation during calving and herd vaccinations.
- Improved nutrition of the cows.

ii. Livestock Nutrition, Feeds and Feeding

Beef production in Kenya is carried out in different production systems. A production system is a form of management approach, which is adopted to suit a climatic situation and to achieve a given objective. There are four main production systems practiced in Kenya, including, Nomadic Pastoralism, Ranching, Agro-pastoralism and Feedlot system.

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through livestock feeding on crop residues and crop farming benefiting from manure and animal draught power. The Feedlot system are units where immature are intensively put on a feeding regime purposely to fatten so as to attain a specific market weight prior to being sold. The animals are confined like in the zero grazing units in dairy production and are fed on high-energy concentrates. This system is not in use in the arid lands of Kenya.

Beef production in Kenya is pasture-based and hence dependent on land availability. Continued subdivision of land and persistent droughts pose a particular challenge to beef production, especially during dry seasons. Subdivision has led to shrinkage in the grazing resource base and consequently affects the productivity of the animals.

The main beef feeds consist of roughages, concentrates, minerals and vitamins. The greatest proportion of diet for ruminants is roughages that include grass and browse. Grazing animals beef are basically fed on natural pastures or fodder with supplemental concentrates for high yielding animals. Grazing beef often go through periods of feed scarcity and feed glut. During the rains, for instance, pasture and fodder production exceeds requirement by animals. On the other hand, quality and quantity of pastures decline as a result of drought and pests during the dry season. There is need, therefore, to minimize this feed wastage during the rainy season and to find alternatives to fodder during periods of scarcity to minimize loss in production and animal stocks.

Beef feeds in Kenya account for between 60-80 percent of the production costs in livestock farming, depending on the intensity of production. Domestic supply of animal feed has been volatile due to its dependence on the seasonality of supply of inputs. The basic factors affecting the supply of quality feed are its price, availability, the quality of raw material used, processing methods, handling and storage of mixed feeds, among other factor. Most of the fine ingredients including vitamins, minerals, amino acids and other feed additives are imported. However, the standardization of feeds for some other categories of animals is not complete. In addition, feed ingredients themselves are not fully standardized. As a result, feed manufacturers face great difficulties in meeting acceptable standards of feeds using such feed ingredients.

The poor quality of commercial feeds has been a major complaint among livestock farmers. Feed quality is assessed in terms of nutrient composition as well as the presence or absence of substances that may be harmful to life, e.g. aflatoxins. Poor quality feeds is a result of many factors, including lack of standardization and high cost of ingredients, poor training of the feed

manufacturers, failure to use laboratories for nutritional analysis as well as weak legal and institutional framework to enforce quality assurance. Indeed, the latter limitation has led to cases of counterfeiting of popular brands of feeds and adulteration of complete feeds.

Napier grass is the fodder crop of choice in the High and Medium Potential Lands (HMPL). It is widely grown in the country and often in areas that are unsuitable to its production. Acceptable alternatives to napier grass fodder have not been identified. Already, napier grass production is threatened by two diseases, i.e. napier smut and napier stunting.

The range environment is fragile and, due to its inappropriate use, degradation of the range has been observed in some areas. This situation reduces the capacity of the land to support enough livestock in the rangelands. There is need, therefore, to develop strategies that will protect the environment and support livestock in a sustainable manner.

It has been established that droughts and famine in the country occur over the lapse of a regular span of a certain period lapse. However, their effects are felt more by the pastoral community through human suffering and loss of their livestock. During the drought, human suffering is ameliorated somewhat by famine food relief. However, after the drought has taken its toll, many households are often left without sufficient livestock to sustain their livelihoods. There is, therefore, need to minimize animal losses during drought in order to facilitate faster socio-economic recovery of their owners after the lapse of drought.

iii. Animal Diseases and Pests

The most prevalent diseases include rinderpest, foot-and-mouth disease (FMD), lumpy skin and contagious bovine pleuropneumonia. More outbreaks of FMD have been reported in recent years than of the other diseases. Animal diseases and pests control is important for the viability and sustainability of the livestock sub-sector. Animal diseases and pests contribute significantly to low productivity of farm animals and impact negatively on both local and international livestock trade. The most important notifiable diseases in Kenya are Foot and Mouth Disease (FMD), Anthrax, Contagious Bovine Pleuropneumonia (CBPP), Rabies, Lumpy Skin disease, Contagious Caprine Pleuropneumonia (CCPP), East Coast Fever, Rift Valley Fever and Trypanosomiasis. Indeed much of Kenya has been declared rinderpest free, except a small corridor along the Kenya/Somalia border. There are, however, emerging notifiable diseases, like

Avian Influenza, which are of great economic and public health importance. Of more significance also are the non-notifiable diseases like worms, reproductive disorders, mastitis, scours, zoonotic and tick borne diseases that affect large number of livestock in the country and which need sustained vigilance and surveillance in order to control.

The following are the main challenges facing the control of animal diseases and pests in the country;

- absence of adequate capacity for disease control and clinical services,
- little public awareness on disease and pest confirmation,
- inadequate epidemio-surveillance,
- poor tick control, weak inspectorate and
- quality assurance,
- lack of enforcement on existing rules and regulations on movement of livestock and livestock products both within the country and across the national borders, and
- inadequate human, financial and physical capacity to enhance performance of the Department of Veterinary Services.

Large tracts of land in Kenya are underutilized because they are infested with tse tse flies which transmit trypanosomiasis bugs. Control of livestock movement serves the twin purposes of minimizing stock theft and controlling livestock diseases.

- Kenya has expansive and porous borders with its neighbors; In addition, there is little coordination and collaboration with the neighbors on disease control across the borders, making control of trans-boundary diseases a major challenge.

It is estimated that livestock reproductive diseases account for substantial economic losses to

livestock farmers. The country ensures quality and safety of animal production inputs and products, through the National Laboratories at Embakasi and Kabete, and six regional laboratories and the establishment of disease free zone in isiolo, nanyuki, namanga and coast.

d) Environmental Issues in Beef Production.

Pastoralism, which contributes a large percentage of beef produced in Kenya, is a livelihood derived mainly from livestock foraging on the natural vegetation. The success of Pastoralism is therefore dependent on well-managed environment. Over the centuries, the pastoralists have always lived in harmony with his environment. However, new and emerging situations have led to interference in this harmony resulting in environmental degradation and reduced benefits accruing to the pastoralists. These effects include:

i) Soil Erosion

Soil erosion occurs when soil cover is destroyed. Such destruction is normally caused by overgrazing occasioned by over concentration of livestock in one particular area. Sedentarization and settlements are the primary causes of natural resource and environmental degradation in pastoral areas.

The provision of unplanned water and social amenities reduces mobility of pastoralists and increases pressure on vegetation around the settlements.

Poor marketing of livestock and their products result in pastoralists looking for alternative sources of income e.g charcoal burning, firewood etc. Prolonged droughts lead to over concentration of animals in watering areas hence vegetation destruction by both pastoralists and their livestock.

Environmental degradation has been exacerbated by widespread and indiscriminate cutting of trees for charcoal burning, firewood, housing etc .

ii) Environmental Pollution

a) Animal waste products (Manure, urine & blood) from poorly sited slaughter facilities can cause contamination to both surface and ground water sources - There is need for Environmental Impact Assessment (EIA) for new slaughterhouses and slabs and environmental audit for existing ones.

b) Soils and water pollution from improper use and disposal of pesticides – water user Associations to be in the forefront in sensitizing members on safe use of pesticides.

Environmental contamination by poorly disposed diseased carcasses resulting in spread of diseases Carcasses from dead animals irrespective of probable cause of death must be completely burned or buried in a minimum 4ft pits. Invasive species – *Prosopis juliflora*, *Ipomea* spp, etc.