CAMEL MANAGEMENT FROM BIRTH TO PRODUCTION

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As desert land area is prone to frequent draught, the small and marginal farmers of this region rely heavily on livestock enterprise for their sustenance. The livestock should be compatible with crop cultivation instead of competing with it for land and water resources. Camel rearing enterprise fits well with such requirements. In comparison to other livestock species camel remain neglected until this century when it draw attention because of it's unique adaptive characteristics for survivability in harsh conditions of the desert eco-system. The camel "Ship of the desert" uses various adaptive mechanism rather than bullock for survival in the desert. Since maximum of the gross cultivated area of our country is non-irrigated camel hold a significant potential for financing. Camel energy is not only cost effective but also profitable and remunerable. Camel management system should be focused on higher growth performance, suitable body conformation, and good health status requiring lower economic intervention from birth to production.

Sign of labour pain during Parturition in camel:

The post partum mortality of camel calf can be reduced by adapting scientific management practices during parturition. The following behavioral sign of labour pain of parturient camel should be watched carefully:

- The parturient camel wants to be alone and separate from the main herd is very common and prominent sign.
- The showing two grooves on either side of the root of tail.
- Concavity between the site of pin bone which is mainly due to relaxation of sacro-siatic ligaments.
- Vulva is visible swollen round.
- Repeated lying down-standing up.
- Superficial mammary vein become tense and tortuous.
- Swelling of udder and teat are very common sign which indicates that delivery process is likely to be start very soon. Where as some other sign viz: 'Looking to the Flank' and 'aggressiveness' are not so common.
- The pregnant camel, showing sign of parturition should be kept in isolation.

Management of newly born calf:

The bellow mention important points should be followed for scientific management of newly born calf.

- Assistant should be provided in case of difficult situation of expulsion of foetus.
- The naval cord should be ligate properly and dressed regularly for 2-3 days with antiseptic solution.
- Just after birth nasal opening of calf should be cleaned with soft and clean cloth, and other part of the body should be cleaned.
- After 1-2 hr of expulsion of foetus, colostrums must be provided to calf.
- In order to avoid calf diarrhea excess amount of colostrums are not provided.
- Generally parturition is occurred during cold season. Special care should be given to avoid direct cold wind to neonate.
- If parturition occurred in month of April or May then it should be protected from hot climate and try to keep it in some cool place or under tree shade, to avoid heat stroke.
- To avoid night blindness and calf diarrhoea, 3 - 4

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days after birth of calf vitamin 'A' injection (1 to 1.5 ml) and Cloramphenical (1 gm) may be given.

- Generally weaning is not practiced and regular milk feeding from dam should be allowed for 9-10 months.
- Calf should be allowed to move with dam for proper growth and to develop browsing and grazing activities as earliest possible.

Management of Pregnant camel:

The below mention important points for pregnant camel should be followed strictly.

- Advanced pregnant camels should be supplemented with mineral mixtures.
- The first age at mating should be the age of 3-4 years.
- The vitamin 'A' injection should be given to pregnant camel about 2-3 months before parturition.
- Proper care should be given in case of first birth.
- The pregnant camel should not be allow for grazing at least one week of the expected date of parturition.
- Attention should be given for expulsion of placenta after parturition.
- If dam is not adopting her calf after parturition, it is practice that a piece of thin cover place on the calf and it is made to smell the camel. Sometime in such cases dam and calf should be kept in an enclosure to solve these problems.
- After milk suckling by calf, if excess milk is in the udder, it should be stripped out.

Management of Male/Rutting camel:

The following points for male/rutting camel should be followed.

- The age should be 5-6 years for breeding purpose.
- The male breeding camel should be kept away from female camels during rut as they may injure other animals.
- To prevent bite, male breeding camel should be secured properly and separately.
- They are not allowed to go for grazing but exercise should be provided daily.
- Vitamin 'A' should be given as a prophylactic measure.
- As breeding male camel loose their body weight during rutting season, special feeding/concentrate should be provided.

Rutting in male camels

In India rutting in male camel occurred during winter season. Rutting symptoms are as follows:

- Loss of appetite and weight loss are the main signs of rutting.
- Aggressiveness, making territory, restlessness.
- There is copious secretion from poll (occipital) gland. The secretion is dark brown with acrid smell and androgens are present. Histologically the poll gland resembles endocrine gland. The secretion of the poll gland attracts females during breeding season.
- Characteristically male in the rut eject out soft palate (gula) from its mouth by filling air from trachea. Air is retained for about 5 to 10 seconds, after which it is expired with a gurgling sound, the pressure is released and gula collapses.
- A camel in rut stands with hind legs apart.
- Flapping the tail up and down with frequent micturation and throwing urine over back again and again.
- The hind portion of the back gets soiled with urine and dirt resulting in thick black streak on the back.

Sexual desire can be reduced, if rutting males are put to hard work. Ideal ratios of male to females during breeding season are 1 male to 5-7 females. One camel stud can breed three females per day at peak of the breeding season subject to good management and health. Keeping extra males is desirable to provide genetic diversity and to check inbreeding for wider and efficient selection.

Package of practices of camel Management

The camel has domesticated more recently than other animals. The most probable period of domestication of camel is prior to 1800 BC. The methods of camel keeping are now changing worldwide because the grazing land is decreasing as more land is put under cultivation reducing the free grazing land. Camels which are largely maintained under extensive system are now facing problem and their management needed a better alternate system which is socially acceptable and economically viable.

Camel Management practices by Raikas:

Large camel herds are owned by Raika/Rabri community. Other groups viz Jat, Rajput, Muslim owned small number of camel. The Raikas are intimately familiar with the lineage of their camel and provide information on the performance of camel of the last 7-8 generations. The recent camel management by Raikas are extremely diverse, varying from free ranging for most of the year at one extreme to continuous closely supervised herding at the other. The ecological setting and the degree of competition from other land use strategies determine which particular herding system is adhered to it. Many of the migratory camel herd return at regular intervals to the villages for water, but they can also range several hundred km from their owners home. The Raikas are able to keep track of their movements because they can identify the footprints of each of their camels.

Camel Management practices by Extensive System:

In this system camels are allowed to graze freely and reproduce freely. All the camels are collected once every usually in the spring season for hair shearing, treatment against mange, branding etc. The animals are released for free grazing again after above operations. It is usually necessary to collect camel herds during the 3 months of the rainy season (July to September) to prevent them from damaging crops. Most, but not all herders also like to supervise their camels during the breeding season which traditionally falls between the two Hindu festivals of Diwali (around November) and Holi (around March) in order to prevent fights between competing males.

Camel Management practices by Semi-extensive System:

In this system camels are maintained around cities and villages in the marginal area. During severe drought period camels have been fed special feed lots for 2- 4 months, during this period daily gain are expected to be more.

Camel Management practices by Intensive Management System:

Due to shift in cropping pattern, camel keepers are facing a great problem to rear their camels in extensive system of management. So they are forced to rear their camels in intensive and semi-intensive systems of management. But these systems may not be as economical as extensive management system and growth performance of animal is also affected. In field conditions, the breaking age of camel is about 3 to 4 years of age i.e. camel calves who are reared under extensive management condition, used to achieve 350 to 400 kg body weight around that age. After achieving this body weight, body conformation reached to a level suitable for putting the camel to work such as carting, thereby becoming economically sustainable. This intensive system is mainly followed in cities /big towns as source of livelihood by transporting various materials viz : food grains, gas cylinders, building materials, fodder etc. Under this system camel are stall fed exclusively on purchased feed from market. Some of these camel owners also do agriculture farming during rainy season (July to October months).

Housing Management

The open type shed is provided with 1.5 meter high barbed wire fencing. Studs and those animals which required individual feeding are kept under roofed shed separately. Each animal is provided with 30-35 m^2 space and a manger of 75cm ′75 cm′40 cm internal dimension. Pregnant and recently calved animals should be kept in a separate open type shed. Sick animals are housed in a sick house of 6m ′ 6m dimension. The soiled sand of the floor is replaced with new sand.

Manger : A manger about 90-120 cm high is constructed. A square pillar about 92 cm height is

erected and over it, a platform of about 70 cm ' 70 cm is constructed and a wall of 15 cm thickness is built on all the four sides of it from 30 to 45 cm height. This is box like manger without lid.

Other types of Manger : The cheapest type is constructed by i) Digging a pit in the ground of about 50 – 70 cm diameter and 50 cm deep, ii) The manger is made up of kachchha bricks or mud and cow dung or pucca bricks.

Following three types of shelter of camel may be constructed.

1. **Thatched roofed open type Kuchchha shelter:** It has constructed according to locally available ecofriendly agricultural materials. It is having covered as well as open area. The roof made up of Khemp (Leptadenai Pyrotechnica). One side of roof has supported by wall and other side has by pillars (14"). Kuchchha manger has constructed with mud plastering in side covered area. The enclosure are made up with balli / bamboo of 6 ft height. Front side of enclosure is having a gate which is of sliding type. The height of roof is 15 ft (Back) and 12 ft (front) with sufficient slope. The covered area is 33 ft (length) x 14 ft (breath). The floor is kuchchha with lose sand dune. Total area space of this shelter has length – 40 ft, Breath – 33ft. It is open type shelter.

   Dimension of manger : Length-32 ft, Breath –2.5 ft, inside depth 1.5 ft, height of front wall from ground 3.5 ft.

2. **Asbestos roof close type concrete shelter:** It is also having covered and open area. The covered area has covered by asbestos roof with concrete wall at 3 sides. The floor has with loose sand dune. The manger is of concrete / pucca type. The open area is enclosed with balli/ bamboo of having a gate at front side. The gate is of sliding type. The total area space (covered and open), height of roof, dimension of manger and enclosure are almost similar to the thatched roofed open type kuchchha shelter.

3. **Under tree shed / loose housing system:** In this system the open type paddock has provided and it has enclosed by wire fencing. The fence has supported by iron angle. Some Kikar trees (Prosopis Juliflora) are there to provide shed to camels. The floor is Kuchchha with loose sand dune. Kuchchha manger has constructed with mud plastering just beneath the tree sheds. The manger is of round type. The dimension of manger, height of fence etc are almost equal to other two types of shelter.

Feeding Management practices

Camel mostly get feed from trees bushes and rarely from grasses. In stall feeding conditions the average feed consumption is maximum in the initial 2 hrs which decreased subsequently. The camel continued to consume feed during night's time and consume 35- 40% of total feed consumption during night alone.

The following age wise feeding schedule should be followed for camel for scientific and economic management.

Age (months)	Fodder and Concentrate
Up to 12 month of Age	2.5 Kg Fodder + 0.5 Kg Concentrate Mixture
1-2 Year	5 kg fodder + 1 kg Concentrate Mixture + 30 gm Salt.
2-3 Year	8 kg fodder + 1.5 kg Concentrate Mixture + 90 gm Salt.
Above 3 Year	12 kg fodder + 2.5 kg Concentrate Mixture.
Adults	14 kg fodder + 3 kg Concentrate Mixture.

In semi intensive condition camels are provided with dry fodder viz: moth, guar, mumphali chara. Concentrates are mostly molasses, oil (from groundnut or sesame). Their ability of camel to survive long period under hot dry climate without water is legendary. Through ages, the anatomy and physiology of camel has evolved mechanisms to combat the hostile environment of the desert, to thrive on scanty

food, to dissipate body heat and to survive without water for long periods. Modified structure of the four stomachs, ability to digest coarse vegetation, rise in body temperature, passing of concentrated urine and dry feces are some fine examples. It has been estimated that a well-fed camel could carry some six months energy on it's back while cattle are unlikely to have more than two-three months, if run out of food.

Management practices for round the year:

As part of scientific management practices, the camels must be provided both prophytactic and curative measure to control ecto-parasite and internal parasites. The calves and pregnant females are given vitamins-A. A course of antibiotics is given to check diarrhoea.

Schedule of scientific management practices for round the year.

Month	Activity Schedule
January	Breeding, Calving, Providing Vitamin A, Screening for Ecto and Endo parasites
February	Breeding, Calving, Providing Vitamin A,
March	Calving, Clipping, Deworming, Insecticide spraying, Prophylactic treatment for Surra.
April	Soil treatment (to combat Mange), Branding.
May	Screening for Ecto and Endo parasites
June	Screening for Ecto and Endo parasites
July	Screening for Trypanosomiasis
August	Screening for Trypanosomiasis
September	Deworing and Prophylactic treatment for Surra
October	Spraying for Ecto parasites, Providing Vitamin A to pregnant female, Weaning of calves, Soil treatment (to combat Mange)
November	Providing Vitamin A, Supplementation of concentrate to breeding male and female, Insecticide spraying
December	Breeding, Supplementation of concentrate to Breeding males, Screening for Ecto, Endo parasites.

Management for soundness of camel:

The following points are to be considered for sound health of a camel.

- The skin should be bright and clean, not matted and dirty.
- The eyes should be bright and alert not watery and dull.
- The hump should be well developed and should not be sagging to one side.
- The neck should be flexible, and the head carried on it gracefully. The other end of the neck should be attached deep in the chest.
- The limbs should be muscular and straight, the hind legs should not have cow-like hocks.
- The fore legs should be neither too far apart nor too close together. The toes should be straight and not turned out or in.
- The legs should be proportionate to the body.
- The hind quarters should be well covered with muscles and the tail set high up and of a moderate length.
- The paces of the camel should be easy, and can go freely at the pace required with out coaxing or beating.
- The chest should be deep and not round. The ribs should be well sprung and at a fair distance from the pelvis.
- The breadth of the body should be proportionate to height.
- The skin should not be too thick, especially in riding camels.
- The teeth should be in level and not irregular or broken.
- The chest-pad should not brush against the elbows while the camel is walking or running.

The following points are not desirable and should be avoided in all camel :

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- Narrow or shallow- chested camels are usually weak and can not be put to hard work or long rides.
- Camels with bent hocks and long shanks are not good for either baggage or riding purpose.
- Under-developed chest-pad.
- The skin, especially inside the elbow, should not be so thick or thrown into folds as to lead to rubbing and brushing when the camel walks or runs.
- Watch the camel while in sitting down and standing up. A slow riser or one who takes a long time in sitting down and whose hind legs show a tremor at the time of sitting down should be discarded.
- If the camel had firing marks on knees or hocks, it means that he has suffered from arthritis or rheumatism. Brand marks (firing on thigh or shoulders) are not considered a defect.

Production aspects of Camel

The various production aspects of camel and its product and by product are given below.

Management of milking camel:

Preparation of camel for milking: Following points should be taken care during preparation of camel for milking.

- The milking place should be thoroughly cleaned after each milking.
- Dusty fodder and any materials should be avoided in the milking place.
- The hind quarters, thighs and udders of camel should be brushed or washed before milking.
- If there is more hair growth in the udder region, it should be clipped periodically.
- Just before milking (after suckling by calf), the udder should be wiped with a cloth dipped and squeezed in some weak antiseptic solution.
- In cold weather, warm antiseptic solution should be used for the purpose.
- Apart from the camels udders and the milker's hands, especially milking pails and cans should be clean.
- The milkers should wear clean dress and cover their heads with suitable caps, to avoid fall of loose hair in milk. Their nails should be periodically trimmed and hands cleaned and disinfected between each milking by dipping in an antiseptic solution.

Hand Milking:

Camels are generally milked from the left side. There is no hard and fast order of teats while milking, the engorgement of teats due to letdown should be the actual guideline. Milking in camel is usually done in standing position. Usually milker stands on left side of camel on one leg, while thigh of other leg is used to place milking container over it. The frequency of milking is not fixed. It can be carried out twice/thrice in a day or as per yield. One milker, depending on his skill may milk 10 to 12 camels including activities connected with milking like cleaning the camel, udder and feeding of concentrates. Machine milking and automatic udder washing equipments may make the tasks associated with milking easier and less time consuming. But, in a developing country like India where providing labour is a major social objective for any enterprise and where labour is relatively cheap, hand milking is encouraged.

Milking pail and storing:

The aluminum containers, steel buckets are used for milking. Storing milk in metallic container or in earthen pots is common practice.

Machine Milking:

Milking machines use alternating negative and atmospheric pressures with the help of a double chambered teat-cup assembly. A number of factors influence the efficiency of machine milking like vacuum level, pulsation rate (the number of cycles of alternating vacuum and normal atmospheric pressure per minute) and the pulsation ratio (the proportion of time of vacuum and atmospheric pressure applied).

Production and management of camel hair:

The camel hair and it's products can be an important

source of additional income for camel keepers. The handicraft articles made up of camel hair, provide work to rural women in the field of grading of hair, tops preparation, spinning of hair, weaving, embroidery with 100% specialty hair and blending with sheep wool, goat hair, cotton and other products. Camel hair is used in village cottage industry for preparation of common utility items, viz : Blankets, bags, mattresses, ropes, floor rugs etc. It is widely use in rural cottage industry of Rajasthan and Gujarat for preparation of various items. The preliminary results of camel hair blends with wool, silk waste and polyester have shown encouraging result. Blended products may also be prepared with sheep wool, goat hair and cotton. It is worth while to blend camel hair with polyester, wool or silk waste. The camel hair is being utilized in India since ancient times. It has been estimated that a camel hair fabric of 620 gm weight will be as warm as a pure wool fabric of 900 gm weight. The hair is spun by camel keepers by using traditional simple techniques. The coarse variety is span by Hand Dheyria. The other method of spinning fine quality camel hair is by hand charkas. In the recent times machine spinning is becoming popular for carpets, dumese clothing. The camel hair is strong and is twice as worm as wool. The main body sites of hair coverage in the dromedary camels are shoulders, mid portion of body, neck and hump regions. The hair of dromedary camels is durable, strong and has low conductivity. The camels of Bikaneri breed of 2-3 years of age produce higher annual hair yield as compared to other age groups and breeds. The utilization of camel hair is having great importance in exploiting the hair production potential and quality of hair for its future utility as pure camel hair as well as blends with other animal fibers, synthetic waste fibers and its uses in the rural cottage industry. The fineness of hair of Indian camels ranges from 25 to 40 micron. The proportion of medulated fibres ranges from 50 to 80%. The fibre length ranges from 5 to 7 cm. The vegetable matter contents are from 4 to 5% . The pH is 7.02. The single fibre tenacity is better than wool which ranged from 15 to 17 g/tex. The camel hair and wool blend, polyster blend and silk waste of blend have good commercial prospects. The blend slivers exhibit sliver strength of 11 to 19 g/text.

Management of camel skin:

Camel skin, if processed properly can be used for making leather goods, viz., shoes, sandals etc. Recently camel skins are used for making fancy items of tourist interest, viz: Purse, Bag, Stool cover, Jewelry box and various decorative items etc. In the olden times, camels skin are utilized to make containers for storing and carrying water, oil and ghee etc. It is well suited for the application of color and in Rajasthan there is a tradition of making elaborately painted small container (*kuppi*) by using camel skin.

Management of camel bone:

Camel bones are as important raw material for the manufacture of jewelry in some parts of the world. In India since ivory has been banned, it has often been replaced by camel bone. Recently camel long bones are used for making fancy and decorative items. Camel bone is also made into bone-meal for fertilizer.

Management of Camel Dung

Dung ranks as an important byproduct. Camel dung is good source of organic manure and dry dung is also used as fuel. For pastoralists inhabiting barren territories it can be the most important source of fuel. In the semi-arid parts of India it has values as a fertilizer and sold by camel herd owners. Land owners compensate camel breeders in cash or in kind for overnight stays on their fields. Brick factory are also using camel dung as fuel.

Management of Camel as Game Animal

In recent times, the use of camel as a race animal in the Gulf countries and certain Arabian countries has gained enormous importance. Very large money is involved and the economic importance of camel as race animal has increased tremendously. Camel safari is very much popular for tourist.

Management of camel for marketing:

The animal husbandry nevertheless plays a vital role in the economy of India and contributes more than 60 % of the GDP of the region. The camel marketing through livestock fairs in western Rajasthan has opened new avenues for farmers. Marketing of camel is considered an important trade in the Rajasthan

where it is widely used as draft animal. The camels are mostly marketed at big animal fair such as Nagour, Pushkar, Tilwara, Phalodi and Gogameri.

The average cost of camel varies according to age and sex. The camel of either sex and more than 7 year age group is costlier (Rs 40,000 to 50,000 /-). On the other hand male camel is costlier than female in all age group cases. Continuous drought since last three years the cost of camel appears to be going down but still farmers get maximum of their expectation from this livestock (camel) in hot arid region.

Management for carting:

The comparative study between camel and bullock carting systems revealed that pay back period is almost double in case of bullock carting as compared to camel carting, where as the Benefit Cost Ratio is ¾ the time high in case of camel carting as compared to bullock carting. Due to short pay back period and higher benefit cost ratio camel carting is profitable and advantageous over the bullock carting for small dry land farmer in the hot arid Thar desert. Indian camel carry the load of 1.5 to 2 tons for 4-6 hour covering a distance of 30-40 km on two and four wheel cart without showing signs of distress. It can work for 4 hr at a stretch and 6 hr with 2 hr rest in between. The speed, draught force, work performance and power out put reduce with the increase in distance covered.

Thus abbreviation of 'CAMEL' may be expanded as 'C' – carrier, 'A' – Arid zone, 'M'- multipurpose, 'E'- Eco-friendly and L-Livestock. Rapid charge in agro-ecological condition and industrializations in recent past has its impact on camel production and management systems. It is essential in future to adopt scientific management practices from birth to production to get efficient utilization of camel resources round the year for different purposes.

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