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CAMEL HUSBANDRY AND MANAGEMENT BY CEELDHEER PASTORALISTS IN CENTRAL SOMALIA[1]

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CAMEL HUSBANDRY AND MANAGEMENT BY CEELDHEER PASTORALISTS IN CENTRAL SOMALIA

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Introduction

This paper describes the indigenous system of camel pastoralism used in Ceeldheer District of Central Somalia. It reviews camel ownership, herd structure, foraging, watering, breeding, and milking, and the role of camelmen in general. It is based on a field study conducted by the author in 1986 and 1987.

Ceeldheer, the southern-most district in Galguduud Region, Central Somalia, is located along the Indian Ocean. Its area of about 9000 sq km contains three physiognomic regions which form the major camel habitat (Fig 1). The first (region), Xarar, is a Transitional zone of grass - shrubland adjacent to an extensive grass plain. It is level to gently undulating, extending along the coast. The second (region), Carroguduud or Central Ridge, occupies the centre of the District. It has gentle slopes forming gullies in the eastern slopes which carry seasonal streams through the transitional zone and disappear in the grassland plain, never reaching the coast. The Central Ridge is closed to foraging of livestock during wet seasons (period of most intensive vegetative growth) because of incidence of a riibi - a biting fly which is also a disease vector for animals. The third (region), Buur or West, is an inland plateau. It has level to gently undulating slopes with stabilised, sometimes large, sand hills.[2]

Traditional livestock production systems in Somalia involve camels as a source of food, prestige and security against environmental disasters. Many livestock production planners and

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[2] Ceeldheer District's range ecology was extensively studied by Herlocker and Ahmed (1985). Holt (1985) and Behnke (1988) describe agropastoralism in the District and neighbouring areas. These publications give detailed information on vegetation, soil, climate and land-use systems.

researchers, especially foreign experts, have overlooked the usefulness of camels for the Somali

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Figure 1

pastoralists and their importance in the national economy. This paper discusses camel pastoralism, ownership, herd structure, foraging, watering, breeding, milking and the role of camelmen in Ceeldheer District of Central Somalia. It aims to provide an in depth understanding of the entire camel production system for livestock developers and policymakers.

I Ceeldheer pastoralists

Ceeldheer pastoralists are friendly, honest and open-minded people. Like other Somali nomads, they are famous for movement, resistance to hunger and thirst. But their environment is unique in one aspect. In their habitat, no human or animal predators exist - except for few foxes and wild dogs (Weer). Unattended sheep or goats are seldom taken by predators, and camels are absolutely free of them. When foraging in the home area, camels are left unattended for the whole day. Only a morning and evening check to know where they will be for milking is required. When they move beyond their home area during biting fly infestation and in dry seasons, camels are given closer attention. Calves are tied to trees or shrubs and herds stay together in an open area with calves at night. It is rare that camels spend more than a few nights in one place.

Besides being free from predators, Ceeldheer pastoralists generally live in peace. Only occasionally do disputes arise with neighbouring clans. They are more sophisticated than their neighbours in dealing with government agencies and maintaining their herd sizes. In fifteen camel herds, the average number of camels per herd ranges from 50 to 60 head excluding burden camels. Each camel herd is owned by at least two families. Permanent wells are a long distance from each other and temporary water reservoirs are few. Farming is confined to small areas of private ownership. Vegetation degradation is prominent only near permanent water sources in villages and in misused farming areas surrounding villages. The condition of vegetation in the rest of the district is in fair to good condition. Frequent movement

of the pastoralists and infestation of biting flies led to a natural rotation of areas being used. Because of this natural grazing system, supported by good management in the allocation of water points and the choice of kinds of livestock, an ecological equilibrium seems to prevail. Changes in any of these factors may reduce and eventually destroy the equilibrium that has existed for centuries.

The risky nature of the environment, the continual redistribution of livestock wealth between households, and labour requirement, discourage any widespread and permanent wealth accumulation. Pastoral wealth lies in livestock and remains vulnerable to drought and diseases. Because of the low fertility rate, the slowness of the reproductive cycle, and the cost and intensive labour requirement of camels, some pastoralists in Ceeldheer District have been unable to acquire adequate camel herds. Instead, they have turned to raising sheep and cattle in the coastal plains. Because of the difference in ecological requirements, it is rare to find camel and cattle raised together.

Camels are the main reserve stock. In the traditional pastoral economy, they are not frequently sold. As a result, pastoralists are mistakenly thought to prefer the prestige of large herds to the money and goods that could be obtained by selling surplus animals. Among Ceeldheer pastoralists, this is simply not true. Their strategy is to maintain balanced family herds to secure a stable subsistence and to ensure optimal production. The herd size must match the family size for proper management.

Herdsmen manipulate their herds to suit existing environmental conditions, family needs (which determine herd composition and size), and labour availability for herding. They maximise livestock productivity to the best of their ability. Members of the same lineage or social group usually migrate together in the direction dictated by the needs of their livestock.

II Ownership and social value of camels

Ownership of camels in the Somali pastoral societies is well documented by Hussein (1984, 1987) and Hjort and Hussein (1986). In Ceeldheer District, camels are individually owned and inherited. This individual ownership is not absolute. While camels are always considered as clan property, the Somali camelmen say "Kin owners herd camels together but each herder pays particular attention to his own individual camel". This famous proverb implies both individual and communal ownership of the animal. Camels are marked with a specific clan brand with a submark which is unique to individual or family. In time of adversity, when a family loses its animals, the individual owner has no absolute right to give or refuse to dispose of his camels. The kin or clan members decide the distribution of animals to the victim from its members. The animals collectively given to the victim by kin or clan include lactating, pregnant and immature camels as well as sheep and goats. Enough are given to allow them to recover from the shock of the disaster. Before the donation is undertaken, kinsmen and sometimes friends who share the same habitat come together and examine the causes of herd loss to establish whether the loss was due to negligence, or to other causes beyond the owner’s control. If it is proven that the loss was the owner’s fault, a minimum number of animals is given with strong warning; otherwise, a substantial herd is given.

On the other hand, the individual camel owner has the right to loan his camels to relatives and friends. Families without enough milk or transport animals are lent lactating or pack-camels by either friends or patrilineal kin. These animals are returned to the owner without payment when the need has passed. Such decisions are made by the head of the family, usually by consulting family members.

Camel ownership starts at the birth of a child. The father gives his son a young or newly born female camel and other animals as

the base of his future herd (Xuddun Xidh). The child also receives gifts from his close relatives (elder brothers, uncles, etc). As he grows, his herd also grows. At marriage, a portion of the family herd is allocated to him. the allocated herd remains with the family herd. At his father's death, the unallocated stock is shared out among heirs. A new cluster of family holdings emerges; but the animals may continue to be herded together. Camels are herded normally by unmarried young men and teenagers. Women take care of small ruminants and pack-camels. If a labour shortage exists, young girls assume camel herding, milking and watering.

Camels figure in poems, proverbs and songs, and are used in social rituals. While marriage without giving camels to the new father-in-law is unusual in Somalia, in Ceeldheer District camel owners do not practise this custom. They do, however, pay camels for blood compensation and slaughter them for important religious gatherings[3] or settling disputes between neighbouring clans. Camels are the only animal used to determine compensation for homicide, a lost eye, teeth, broken bones, and so on, depending on the circumstance and social status of the victim and the aggressor. Each unit of a man's body is priced by a certain number of camels. Clan members collectively pay the compensation either in kind or in cash equivalence. Usually nomads have pre-fixed reparation for death or for severe injuries, depending on whether the action was done deliberately by negligence or by accident. The clan sheikhs and leaders determine the compensation to be paid to the victim.

III Herd structure

Household needs for milk are the major factor governing camel herd structure and composition. Although camel management

[3] I witnessed payment of eight large camels and hundreds of thousands of Somali shillings by the clan whose camels I studied to a rival clan. This was payment for two men injured in a stick fight.

depends upon both environmental conditions and family needs, family size determines milk requirements and labour availability for herding. Thus, families and herds develop together for subsistence. If labour is available and range adequate, herds may be managed for offtake or prestige.

This study involved observing one camel herd of 70 head in the field for two years, during 1986 and 1987. In addition, herders were interviewed to determine traditions and folklore of management. The study herd was typical of those in the area. It was divided into calf, immature and mature male and female camels (Table 1). Based on total live camels, male calves are 10.6%, female calves 9.4%, immature males 5.9%, immature females 17.6%, mature males 9.4% and mature females 47.1%. The proportion of milking, dry mature and immature females are 35%, 12% and 15.7% respectively. The majority of the females are bred in the spring (major rainy season, gu) and the rest in the fall (short rainy season, dayr) when forage is plentiful, following traditional practice.

Table 1

Calf mortality is high. Out of the 13 camels that died during the study period, 7.4% and 4.6% were male and females respectively. 75% of the males and 80% of the females that died were calves less than 2 years old. Of the reported 'calf mortality', more than 83% of the male calves and 25% of the female calves were slaughtered at birth by their owners. Culling or killing calves to allow more milk for people are the major factors increasing the calf mortality. Offtake of immature and mature camels is low (3.7% male, 2.8% female) if the slaughtered calves are excluded. Herd increment during the 2 years studied was 25%.

In herd management, preference is given to female camels. Camel owners cull male calves to increase the herds' reproductive potential and to provide more milk for the family. The ratio of mature males to all females is 1:11. The total male-female ratio is, however, 0.3:1. Mature males are used for transportation and breeding. In this herd, no particular breeding male was specifically used for reproduction.

IV Camel breeding

The breeding system is based on successful management of male breeding camels. Considerable control of breeding males is commonly practised by all Somalis. The breeding periods are Spring (Gu) and Fall (Dayr) rainy seasons. Camel breeding starts at the beginning of the rainy season and continues throughout the season. Selected female camels are bred in each of two times in a year if no drought occurs.

Selection of future breeding males start at birth. Two to three male calves are selected based on their ancestors' history. Special care is given to them. They grow quickly, becoming sexually mature at the age of five. Special treatment includes providing them ample milk and protecting them from ticks and other parasites. They may not be used for carrying loads. As young potential herd sires, they are allowed to breed only a

limited number of females. When the male is 5 years old, it is allowed to breed a few five year old females. If the progeny are good, the number bred is increased to 50 females at the age of 8 or 9. A herd sire's breeding life can last up to 20 years. A camel female can be bred for about 22 years. About 10 calves can be produced within this 22 year period.
Sometimes, a pack male is used for breeding. During breeding time, however, it is seldom used for transportation. Due to this dual purpose, the pastoralists believe that the breeding life of pack males is short (about 17 years). Rutting males display a fighting instinct, being hostile to each other and sometimes to man. A breeding male does not allow other males older than 2 years to stay in the herd. It does not copulate if other males are on site. The rutting male aggressively keeps its herd isolated from other herds. It frequently moves back and forth and always stands in the direction of expected intruders.[4] The breeding male, whether used as a pack animal or not, can serve females day and night throughout the rutting season. The camelmen try to prevent copulation during the day, but give the camel free choice at night. They believe that frequent daytime mating shortens the breeding life of the male.

Pregnancy can be detected by the herders within 10 days after mating. They watch for the female's pregnancy symptoms such as coiling the tail backward to the hump, frequent urination, the head lifted up with ears pointed straight, and the long neck curved back to the shoulder when a male camel or a man approaches. These symptoms are prominent after more than a month of pregnancy, but are not as pronounced in the first few weeks of pregnancy. However, due to their professional experience, the herders can correctly judge whether the camel is pregnant within a short period after breeding. The rutting male also detects the pregnancy after a week or so. The gestation period of camels is about 13 months.

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[4] Behaviour of breeding males is well documented by Gauthier-Pilters and Dagg (1981).

Female camels that do not conceive are rebred. Sometimes the female refuses to be rebred voluntarily and the herder forces it to accept the male. A rutting male normally breeds about 50 camels. Some owners believe that it can breed up to 200 camels in each season; but the expected breeding life of the male would then be reduced.

Breeding animals are selected to improve productivity. Tolerance to drought and diseases are desired characteristics. Selection of the breeding male depends on appearance and behaviour, physical strength, and characteristics of ancestors (such as milk production, colour, resistance, etc). His progeny are judged by these characteristics. If the owner does not have a breeding male which meets these criteria, he either borrows one from relatives or friends or mixes his herd with another herd with a good breeding male. This action is prearranged with the family who owns an outstanding breeding male.

Breeding males used solely for mating can become sexually active at any season, providing unbred camels are in good condition and plenty of forage is available. So, even in the winter (the long dry season) some camels can be bred. But a pack male used for breeding seldom becomes sexually active in the dry season. Male camels not required for breeding are trained for transportation or castrated. Castration of male camels is a common management technique among all Somali pastoralists. Although the major objective is to prevent breeding by unwanted or inferior males, castration is also practised to promote ease of handling and for economic purposes (fattening for sale). The process of castration takes between 30 minutes and 1 hour. Death rarely occurs. The wound cures within a few weeks. While males can be castrated any time except when very young, usually they are castrated at between 3-5 years of age.

Training usually starts at 4 years of age. It takes only a few days. Until the trained camel reaches 9 years of age, it is not used for heavy loads. At the age of 9, the owners say Waxna

sugayn, waxna seegayn. which means no load bothers the camel. It is at its full strength and may carry the maximum load, eg about 300 litres of water for 5 hours per day.

The role of a mature male camel is to transport water, nomadic houses and utensils, very young children, weak or sick persons, and lambs and kids in the process of nomadic movement. Loading and unloading is always done very quickly. Recently trained camels get restless and require skilled persons to handle them in the loading and unloading process. The person chants songs praising the camel (Abokor, 1987):

> ... trust in God Almighty
> and upon Him strength the burden to bear
> O camel mine!
> Welfare of the family upon thee rest ...

A wise camel owner limits working hours and distance travelled to allow the camel time for feeding and resting. Since most of the year is hot, movement is preferred early in the morning (3 to 10 am) or late in the afternoon (4 to 10 pm). Night travel is used when moonlight is available. Each camel has a rope tied to its head. The rope of the lead camel is held by a guide camelman or woman and other camels are strung out in a line tied to the tail of one another. Usually the line varies from 2 to 6 camels. Generally each household uses 2 or 3 camels as pack animals. It is not unusual to see each household camel led separately by the owner. Camels can be used as a beast of burden from 3 years old to about 20, when it is replaced.

V Selection of foraging areas

The total annual rainfall, its spatial and temporal distribution, the effective rains after dry seasons and their variation, tick infestation and outbreak of flies are all important factors pastoralists consider when management decisions are made about camel foraging areas. Range land is communal except for small holdings individually owned for farming (Behnke 1988). Clan members are closely associated with particular areas of pasture without any specific rights of ownership but with traditional

clan grazing rights. The boundaries of territories are known to individual clan members. A knowledge of plant species commonly selected by foraging camels at different times of the year is also fundamental to effective grazing and browsing management. Camel herders learn these aspects at a young age. Some of the knowledge is passed on orally. Some of it is contained in songs, poems and proverbs. Much of it is gained from watching the camels for years.

Livestock movement in the Ceeldheer District reflects three basic seasonal patterns of movement (Fig 2). First, livestock in the coastal plain tend to utilise the grassland-shrub ecotone or transitional zone, Xarar. During early rains, outbreaks of gilmi flies occur on the grassland plains. Gilmi are non-biting flies that do not sting. They fly around the eyes and nose of the animals, preventing them from foraging. They also deposit eggs under the skin of animals or people, where the developing larvae cause irritation and pain. Camels return to

Figure 2

the coastal plains as vegetation dries. Livestock tend to concentrate near wells along the coast in the late dry season.

Second, the dense shrubland on the Central Ridge, Carroguduud, are vacated during the first week of rainfall because of riibi and soor flies. These are very painful biting and stinging flies, and the riibi are also a disease vector. Riibi fly outbreaks occur 9 days after the onset of rains. Camels are taken from known infested areas a few days before the riibi outbreak begins and stay away for from 6 to 8 weeks. Soor flies start the last week of the riibi life cycle and stay for about 20 - 30 days. The riibi and soor outbreaks coincide with the peak of vegetation growth. Their life cycles cause a natural rotation of foraging which allows the Central Ridge to remain in good condition. It is believed to be the best forage producing area in the District. Because of biting flies, camels move either to Buur on the west (the third foraging area), or to the eastern transitional zone, Xarar, for foraging.

Third, camels move back to the Central Ridge, Carroguduud, late in the wet season, and remain there until the mid dry season. In the late dry season, a concentration occurs around permanent wells outside the area.

Tick outbreaks also play an important role in the selection of foraging areas. Camels are moved to avoid tick infestations even if plenty of forage is available. Repicephalus pulchellus, R. longicoxatus, R. pravus, R. sanguinerus, Amblyomma lepidum, A. gemma, Hyalomma impeltatum and others which were not identified are the most important tick species influencing foraging management. The length of time camels forage in one particular region, therefore, depends upon forage availability and outbreaks of flies and ticks. Camels graze and browse the least in the transitional ecotone, Xarar, and the most in the Central Ridge, Carroguduud, and West, Buur (Fig 3).

Figure 3

Other factors also influence the management of camels from one foraging region to another as follows:

Xarar - Transitional ecotone zone - Camels are moved to this zone for rubbing and body soothing. Without these physical activities, camels will be victims of a bone disease called garbaab which usually attacks shoulder joints. Sometimes it is deadly. During the night, calves are tied where there is plenty of fine dust particles for body soothing. The area is infested with a variety of ticks.

Carroguduud - The Central Ridge is the best foraging area for camels and other livestock. Intensive tick control is required when animals are in the area. Acaricides are used against ticks by rubbing them to the body surface of each camel once in every 10 days. Calves are tied at night in Acacia nilotica shrub community because camelmen believe it is warmer than any other vegetation community during cool nights. Indicating the importance of this area to camels, pastoralists say "Geel Carroguduud waayey iyo rag kulan waayey iyo naago ciir waayey alla ha kaa deqo" meaning "Camels without Central Ridge and men without gatherings and women without skim milk is a curse, so pray God not to allow these to happen". In other words, camels break their hunger when foraging the Central Ridge, men get plenty of food and useful news in important meetings where fat animals are slaughtered, and women get satisfaction when they have skim milk, their favourite food; without these, life is miserably worthless.

Buur - West - Camels are moved to this region because it has less ticks and young camels do better than

other areas. Camels spend their night in old settlements where plenty of Acacia horrida and Solanium jubae shrubs and trees are available, perhaps, for wind protection or for early morning foraging.

Camels may forage in any of these regions at any time of the year except during riibi fly outbreaks in the Central Ridge, or when drought occurs. Traditionally herders spend about half of the year in Carroguduud and the other half in Buur. To a lesser extent they also use the Xarar. Because of ticks and concentration of other livestock from the coastal plains in periods of gilmi fly outbreak, this transitional zone is used only sparingly by camels.

Camels are specifically moved where better forage is available regardless of season or time of year. They are always on the move. This movement is preplanned. A few men are sent to survey areas which are expected to have better forage. They spend days or even weeks in their surveillance. If better places are found, they mark by cutting bushes where camps will be. These marks are respected by all clans unless hostility exists among them. Selected sites are usually old settlements. The scouts return home with the information, and after a day or two, all camel camps move together to the new location. If no better place is found, however, people stay in the same area but camp sites are frequently moved between old camping areas. They seldom camp in a new place. Each day, camels are herded to different locations where evergreen species are available or where the vegetation stays green in the dry season.

VI Watering

Constant movement of camels from one place to another in search of green forage minimises the need for surface water. During wet seasons, the study camels did not drink water. They produced well on the lush plant species consumed, which contained on

average 57% moisture. Average water content of plants eaten ranged from a low of 28% in the winter of 1987 to a high of 65.7% in the spring of 1987 (Table 2). Most of the plants were shrubs; their moisture content was more than 60% in the wet seasons. Even in the dry season, camels were herded where forage with high moisture content (43%) was plentiful (Table 2).

Table 2

The study camels were watered only in the dry season and drought periods. The dry season was divided into three watering sessions (Table 3):

1 - kalhoraad is the early dry season watering when shrubs and trees shed leaves, herbaceous species become dry, and the majority of green forage disappears. Signs of thirst become obvious in most camels. The interval between watering is long; and the amount of water consumed by camels is less than during the following two sessions.
2 - kaldhexaad is the middle dry season watering when camels hunt for much reduced green forage and the few evergreen plants. Deciduous shrubs and trees bear no significant amount of edible forage, availability of dry matter is greatly reduced and the animal hardly obtains sufficient forage intake for survival. The interval of watering is, on average, about 13 days. The amount of water camels drink is greater than the first session.

3 - kaldambeed is the late dry season watering when camels adapt themselves to the available dry forage and start losing weight especially milking camels. Camels are watered in a regular manner. They consume the largest quantity of water compared to the other two seasons. The interval of watering, however, is the same as the second session, about 13 days.

The amount of water a camel requires in middle and late dry season depends on forage availability and its moisture content. Camels are moved constantly to where better feed exists. The animals are kept where the distance to water is not usually more than two days' camel walk.

Permanent water sources are located in Ceeldheer (at the edge of the transition zone in the plain grassland), Nooleeye (the border between the west and the Central Ridge) and Bargaan (West) (Figs 1 and 2). One motorised well (borehole) and a number of wells

16-35 m deep are found in each village. Ceeldheer and Nooleeye are about 50 km apart; Nooleeye and Bargaan about 35 km apart; Ceeldheer and Bargaan about 100 km apart: but in between these latter two villages, half a dozen barkad (hand dug, cemented temporary water reservoirs) are available. There are no earthen water reservoirs (or barkad) available because the sandy soil throughout

Table 3

the District cannot hold surface water for more than a few hours after rain. Walls are built around the mouth of some wells. For others, frames of tree trunks were placed on the mouth in a triangular form, against which the rope of the waadaan is pulled. Most of the time people pull up the full container vertically. Most wells are salty, especially in Ceeldheer village. About 8 to 10 camels drink from the naar at a time.

Pastoralists prefer to water camels between 9 am and 3 pm. When insufficient forage is available, camels are watered in the morning. Camel owners believe that camels consume less water in the cool hours of the day than during hot hours. They think it is not good for the health of the camel to let it overdrink on an empty stomach. Camels are allowed, however, to drink as much as they can when plenty of forage is available. The main objective is to increase feeding time which, in turn, increases food intake. Ceeldheer pastoralists did not like to water their camels from wells with a motorised pump for two reasons. One is that the water smells of diesel, and camels did not like the water. Camels also do not like to drink water used by other livestock or dirty water. The second reason is that water is stored in metal tanks and in the morning is cooler than that from the bottom of the well; camels do not drink to their capacity even in the hottest hours of the day when the tank warms up. Where there is a labour shortage and camels are well-nourished, they are watered from the borehole late in the afternoon. Otherwise, hand-drawn water is used before 2 pm. When undernourished, however, the camels are watered from the tank in the morning so they will consume less water.

In the middle of the dry season, camels often refused water in the morning, but drank a large quantity in the hot hours of the day. In cool hours of the dry season or when the camels' skin is wet - due to high humidity accompanied by overnight dew or by light showers, which occur occasionally - camels are not watered. In the long dry winter of 1986, camels were not watered for 40 days. Camels forage continuously throughout the day for the

first few days after watering. As the watering day approaches, they tend to forage only in the morning and evening cool hours and to rest in the hot hours (11 am - 2 pm).

The amount of water camels consumed was estimated through interviewing experienced camel herders. Most informants agreed that camels drink more water in the winter than in the summer. To verify this, actual measurements were conducted in the summer of 1986 and the winter of 1987 using a naar and a barrel (Table 4). A naar is a wooden trough, concave in shape and holding about 1/4 of a barrel. Both naar and the barrel (cut into halves) were placed side by side supported by wooden posts about a meter above the ground. Waadaan, a leather or plastic container with a long rope, was used to draw water from the bottom of a well more than 16 m deep. Two men alternatively pull out the waadaan full of water. A third man coils the rope behind them. The water is poured into the naar or barrel for the camels to drink. The number of waadaan that was poured into each container and the number of young and adult camels that drank were recorded. The quantity of water in the waadaan was determined using a graduated plastic bucket. The amount of water each group of camels consumed was calculated by using the information obtained from the informants (40 litres for young and 85-91 litres for adult camels).

The quantity of water consumed from the naar was greater than from the barrel since camels were not used to drinking from it. Most camels refused to drink from the barrel. Camels first smelled it and then turned away blindly attacking the naar. Only eight camels drank from the barrel.

For both summer and winter seasons, the interval of watering was 13 days. In summer, the water consumed from the naar was about the same in actual measurement (72.3 litres) and estimates from the informants (73.3 litres). In winter, however, the estimate obtained from the informants (70 litres) is lower than the actual measurement (73.4). The amount of water actually consumed agrees

with the average amount of water informants estimated in late middle dry season (Table 3). However, this study does not confirm the camel herders' belief that camels drink more water in winter than summer. Our figures show no real difference between seasons.

Table 4

The watering men chant, sing and yell camel watering songs (Akobor, 1987):

> ... until the skin comes off
> the palms of the hands
> and the ligaments in man’s ribs asunder break
> camels will not leave the well satisfied ...

Watering is done on the basis of first come, first drink. The camel herds are not mixed when watering. Each herd is watered separately, one after another or simultaneously in different wells.

VII Milking

Securing continuous milk production throughout the year is essential for the survival of Somali pastoralists. The great importance of camels is explained by the fact that they are capable of year-long milk production irrespective of season. However, to achieve this desired outcome requires employing astute management techniques towards both male and female camels. These include increasing the proportion of females in the herd through culling male calves, castrating males which have undesirable characteristics, and keeping adult female camels in milk even though their calves might have died or have been culled.

Somali pastoralists speak of the ’secret of camel milking’, which includes five types of procedure:

1 Salaax (Salah) - Massage

Used to produce milk flow without the presence of a calf or its skin, massage is an easy way of inducing continued milk production by a camel after the death of its calf. The camel is called by its name, stopped, and then its udder massaged; sometimes the skin of the dead calf is also presented. Mature camels are normally so treated, if the family has enough milking camels to risk the possibility of one becoming dry sooner than

expected. A camel may continue to produce milk without a calf for up to six months. The massage technique is also used when the owner does not want to force the camel to accept a foster calf or wants to breed her earlier.

2 Magaar - Saar - Skin cover

The calf's skin can be used to stimulate milk production if a calf dies or is culled at an early age. Butchering of male calves is common; females are slaughtered only during difficult conditions, such as drought. Killing of calves increases the milk available for other calves and people. While out of sight of its mother, a dead calf has its skin removed and placed tightly over a foster calf. Fresh milk from the mother of the dead calf is then sprinkled on the skin, before she is brought to the foster calf. The owner stands between the calf and the mother camel, allowing it to smell areas covered by the skin of its own calf while the foster calf begins to suckle. Usually, the mother accepts the new adopted calf immediately. If not, the skin is left on the foster calf for 2 - 3 nights while it stays with the mother. If the calf is then still refused, she is forced to accept the calf by means of the tolliin method (described below). In other instances, the skin of the dead calf is produced at milking times. Simply because of the stimulation of her dead calf's skin, a female camel may be encouraged to continue giving milk for as long as the other camels are with calves.

3 Sidig

This refers to the use of maternal fluids or afterbirth to bring a female into milk production if a calf is stillborn or culled at birth. Camels in poor condition from disease or malnutrition sometimes give birth to dead calves before the 13 month gestation period is complete. If a camel aborts after seven months of pregnancy, it can be induced to give milk. (Most camels in good condition are not allowed to go dry.) The stillborn calf is

called dhicis (di'is). The mother's eyes are covered with a cloth while the dead calf is taken away. Then a calf whose mother does not produce enough milk or the herd's youngest calf is brought to the female. The calf's mouth is tied with a rope so that it cannot cry out while fresh maternal fluid is rubbed over its body and it is made to sit in front of the mother camel. The female is allowed to stand, while its eyes are uncovered. It smells the calf, and after a few minutes the calf starts suckling. If the mother refuses the new calf, it is lightly punished by bending one of its front legs upward and tying the shin to the foreleg. While the camel stands on three legs, with restricted movement, the calf is tied in front where it can be seen and smelled. The owner unties the mother every hour or two to see if it will accept the calf. During this process the calf is not allowed to see its real mother. It becomes hungry and suckles as time progresses. The female camel seldom refuses the foster calf. Again, if the calf is rejected, the more forceful tolliin method is used.

4 Goobqaad

Goobqaad refers to a different procedure for getting a foster mother to adopt a calf, this time based upon a purposely created disturbance designed to trick the female into accepting a new calf which is not its own. Two milking camels which give birth at about the same time are used. Their calves are always tied together, day and night. Approximately four weeks after birth, when their mothers begin to forage at a distance, the owner catches one calf and slays it. He then catches the other calf and puts it into a dense bush where it cannot be easily reached. Its terrified cries bring the anxious mothers, which try to reach the calf. After some confusion, the man releases the calf and guides it to the mother whose calf he killed while preventing its real mother from approaching them. Surprisingly, the confused mother accepts the foster calf and allows it to suckle; after it finishes, the real mother is allowed to join them. However, if the camel refuses to accept the calf, tolliin is performed.

5 Tolliin

Tolliin refers to physical punishment used to force a camel to accept a foster calf. Used as a last resort, this cruel and painful technique requires two men to perform the procedure. The camel's head is tied with a strong rope, and it is forced to sit. One man grasps the camel's lips and fetlocks into a criss-cross and then in turn to a tree. The camel's anus is blocked (by sewing or a special wooden clamp, called Qaldhac or Qallax), thus preventing defecation. The camel's breathing is prevented by inserting two small sticks, one put between the lower and upper jaws, and the other on the nose in front of the nasal bone. (Alternatively, a single stick wrapped with a rope may be inserted into the nostrils.) The camel can only breathe by opening its mouth, which will become covered with foam after a few minutes. One of the camel's front legs will be fastened to the ground to prevent movement, and the calf will be tied to the fastened leg. Both camel and calf will be kept in this situation for from 3 to 4 hours. The owner then allows the adult camel to breathe and defecate, and checks whether it accepts the calf.

Normally, the adult female accepts the calf after the first punishment. If it is refused, the treatment may be continued for up to 4 days. After that, the female either accepts the calf or is freed.

At birth, camelmen clean out the calf's mouth and nose to ensure it breathes normally. They check it for injuries. Because camel herders believe too much colostrum causes diarrhoea and is dangerous to the calf, its consumption of colostrum is regulated. The remaining colostrum is milked either for human consumption, or most often poured on the ground. If not milked out, it may cause udder infection or reduction in milk. In the first four days, the flow is almost pure colostrum. For a camel in good condition with plenty of forage, regulation of the calf's milk consumption continues for about two weeks. A mother's milk is usually sufficient for its calf and one adult person in the first

few months. While a camel can be milked any time, a two hour interval between milking or suckling is desirable. The quantity of milk per milking period decreases as the interval between milkings shortens. Normally, camels are milked two times per day, in the morning and evening.

Ceeldheer camel owners milk most of their camels for at least twelve months. Milk sufficient for good growth is given to the calf for the first six months. While generally a calf stays with its mother day and night, when the camels are brought to the camp at 6 pm and again about 4 am in the morning, the calf is separated from its mother. The mother is milked for the family approximately three hours after calf separation. For the second half of the year, the family shares the milk equally with the calf. Two teats are protected from suckling. If the calf suckles two camels, one is completely protected by tying all four teats with specially prepared soft acacia fibre called maraq. After milking the calf is allowed to suckle.

The camel teats are prevented from being suckled in several ways. Either the front or back two teats, or right or left two teats (but not diagonal teats) are tied together. Teats are protected alternatively so that the calf does not suckle the same teats every day. The unsuckled teats are believed to produce less milk. The calf is allowed to suckle 6 to 8 hours for the first-half of the year, and 3 to 4 hours for the second half of the year. Milking camels sometimes get lost from their calves. Camels can go for up to 2 weeks unmilked without affecting the length of the camel’s milk production. Once milking starts again, it takes about 3 days for regular milk flow and normal taste to return. A prolonged period of 2 weeks or more without milking may cause a camel to go dry.

Camelmen try to ensure that there is enough milk for the calves

in the first 6 months.[5] Maintaining the growth rate depends therefore on the management given to individual calves. Traditionally calves are weaned between 12 - 18 months of age. Early weaning results in stunted growth. Early weaning occurs if forage quality and availability are poor. When early weaning is necessary, a calf is gradually weaned by tying most of the teats to deny it full access to the mother's milk.

In regular weaning, several techniques are used. One is jiil - a forked stick with four pointed ends tied on the calf's nose to prod the mother when it tries to suck. Another is tying large thorns, spines, or needles, to the teats. A third is inserting a wooden stick in the calf's tongue or slicing the tongue to discourage suckling. If all these techniques are ineffective, calves are separated from their mothers for a period of time.

Calf mortality is high in the first one or two years (Table 1). One of the factors contributing to early calf death is believed to be diseases caused by inappropriate tooth growth. When a calf is about a year old, certain teeth which are believed to cause physiological disorders and dizziness are pried out with a pointed knife or dagger before they emerge. The presence of these teeth is recognised by symptoms such as abnormal regurgitation and chewing, and lack of foraging, loss of activities and weight loss.

Camel milk is consumed fresh or sour. It can be preserved for weeks without special treatment except for sterilising the containers with smoke. Camel herders have different names for the different stages milk goes through before consumption:

1 - Fresh milk (dhay) - salty, sweet, laxative
2 - Transitional stage (Waraaba-qandhis) - looks like melted white wax, not favourable to drink

[5] A study done in Kenya among the Gabra and Rendille indicates that calves allowed the most milk gained 2.5 times more weight per day than those on a limited supply (Field, 1979).

3 - Sour (in different successive stages) - major stages are:
a - Suusac (suusa) - 1st stage
b - Gadhoodh - 2nd stage
c - Dhanaan - 3rd stage
d - Jinow - 4th stage, separated into solids and watery fluid, may cause chest burn

Camel pastoralists also divide milk into three categories according to nutritional quality:

1 From birth to four months (Subag) - meaning butter - implies full of fat, most nutritious.
2 Four to eight months - (Soor) - meaning food, also very nutritious, whoever drinks may not need other food.
3 Eight months to the end of lactation - (Sun) - meaning poison. This does not mean real poison, but indicates that one cannot survive with camel's milk alone. It is least nutritious and the water component is very high.

These milk classifications by experienced camelmen have not been verified scientifically. However, scientific data suggest that camel milk is nutritious and high in minerals and vitamin C during early lactation. The water content of camels' milk increases during the latter stages of lactation or in time of drought (Knoess 1976, Ohris and Joshi 1961, Shalash 1979, Yagil 1982).

VIII Pastoral life

Analysis of camel management would not be complete without discussing the pastoralists' way of life, which is based on livestock. Camels are especially important because they supply

milk, meat and transportation. They are a source of pride and prestige. However, pure nomadism seems to be disappearing in Ceeldheer District. Here pastoralists are increasingly involved in shifting agriculture. While some grow beans and sorghum, others keep to the original life of livestock herding. The rainy season is the peak of labour shortage in Ceeldheer District pastoralists. Camels and small ruminants are moved far away from home areas due to riibi and other biting flies infestation. During this time farming is conducted on the privately held plots. Labour has to be divided between farming, camels and small stock herding. Some people go to herd livestock, while others are left behind to farm or send children to the Quraanic school. Mostly the livestock grazing areas and farm locations are more than 100 km apart, and require days to travel from one to the other.

Camel herding is hard, tedious and tiresome. Days are spent in the scorching sun. Despite this, camel herders are proud of their work and their ability to withstand hunger and thirst. Camels are herded according to their needs, moving from one place to another. This free movement protects the vegetation and minimises desertification. The camel herders enjoy complete independence and self-confidence. They are very careful in decision making, because the slightest mistake may be fatal.

They know their environment very well. They have names for all plants and soil types. They can clearly explain in detail the topography and landscape wherever they once herded their camels. Types of plant growth, species diversity from one area to another, camel preferences in different seasons, plant saltiness, the flowering time of each species, etc are all understood. They can easily differentiate which plant species increase milk production when eaten by camels, or tell from the smell of the milk the plant species camels consumed. They know which species are useful for medicinal purpose. A camel herder is capable of distinguishing his own individual camels from his friends’ or clan’s by its footprints, pace, toe size and shape; and by the

sound of the camel bell. Herders can tell whether the animal was loaded or not, tired or fresh, lame or had only one eye; walking or foraging; thirsty or watered, and so on. They also distinguish people by their footprints and the type of shoes they wear.

The camel owners live simply and freely. They dislike outside pressure from authorities beyond their control. They can go without food for days and never complain. When a camel man travels long distances in search of lost camels or for other reasons, he does not take food except for a few litres of water to sip when he feels thirsty and for praying. Food is provided by the camps he visits. He wraps himself with a sheet or blanket and sleeps on bare ground. He rests on grasses under the shade of trees in the day, or close to shrubs for wind protection at night. Most of the time camel herders wear no shirts, but they seldom walk without shoes. They can walk hundreds of km through a roadless wilderness without losing their directions. Even at night they find their destination using stars as their guidance. They have exceptionally good memories. They remember the smallest details of important events that happened decades ago, and pass them to younger generations orally in a story or a poem.

Camel owners are strong believers in Allah. When food and water are scarce, they never despair but strive with an absolute confidence in Allah. They seem free of fear and worry because of their strong beliefs in God and themselves. However, camel owners become very suspicious when they encounter something new or extraordinary.

Our camel research is a good example. Camel owners had never seen anyone count a camel’s bites, watch its browsing from dawn to dusk, tie pedometers on the camels’ legs, collect plant species they consume, or measure the temperature and relative humidity with shining glasses (ie thermometers). It was all a mystery. At the first calving season following our arrival, camels gave birth to more males than females. A drought then

followed in the fall, which was supposed to be a wet season. Camels gave less milk and refused to be bred. Some of the men concluded our presence was unlucky for their livestock and themselves. They decided not to let us follow their camels. Every time they prayed, when they came together for important meetings or in religious ceremonies, they begged God to destroy anybody whose intention was to harm them. However, because of their strong beliefs in Allah and the respect they accord their sheikhs and elders, they left the ultimate decision to them. We were following the camels belonging to one of their sheikhs. He approved our study. The others forgave us and allowed us to continue the study.

In another incident, some camels became sick in the spring rainy season while we were with them. About 13 camel herd owners came together and decided to beg God to cure the camels. They slaughtered sheep and read Quraan the whole night. The evil among them departed. The necks of individual camels were tied with a thread of sheep skin. This type of religious curing, which is done for sick people too, is called Quraan Saar.

Despite the superstitious beliefs, the camel owners of Ceeldheer District are polite and respectful among themselves. They recognise hierarchical ties to their families, kin and clan, essential for surviving in their hostile environment full of enmity. The existence of strong social bonds and traditional clan structure permits efficient manipulation of their ecosystem. Herdsmen come together not only to exploit natural resources better, but to protect themselves against misfortune and insecurity. Exchange of livestock within and between groups is a common practice to spread risks and build supportive relationships.

Elders are specially respected for their experience. Their advice is always considered in decision making. Meetings are held to learn from each other and to study each other while drinking tea. Serious issues such as rain, herds, movement, etc

are discussed afterwards. Each person in the meeting drinks at least three cups of tea before sheep or goat meat are served with rice or beans. Pastoralists drink tea saturated with sugar for energy when milk is not plentiful.

While Ceeldheer pastoralists consume agricultural products such as beans, rice and flour when they are available, camel milk is the most valuable food; whoever has it proudly offers it to his guests. It is also used as a substitute for water when necessary. For forty eight hours in the middle of fall drought season, we did not drink water. On leaving our vehicle about 25 km away, we loaded one week's ration and 40 litres of water on a camel's back. After six hours of night travel, we reached the camel camp. Though we used the water for drinking and cooking only, by the evening of the third day we found ourselves without water. Fortunately, lack of water is not new to the pastoralists. They poured three kg of sorghum directly on wooden containers full of hot ash and roasted it. Dry pop-sorghum with plenty of camel milk was served for dinner. It was really delicious. No wonder camelmen say, "Water is soul, but camel milk is life".

Hospitality is necessary for the nomads in their daily activities. Visiting, talking and dancing (for youth) are some of the most important entertainment in their migratory life. In their poems, songs and riddles, camels are compared to the most beautiful women, the most precious jewels and the finest weapons (Abokor, 1987).

IX Decision making

Decision making in pastoral society is not simple. Among Ceeldheer pastoralists, settling disputes can involve two different processes. One occurs when dealing with external agents, eg government officials or researchers (see Fig 4). The other occurs when the issue is internal to the pastoral community, eg decisions about livestock management, security or

religious matters. The pastoral community leaders are the governing body in decision making processes.

The clan or subclan members together with the government choose a person from among the clan leaders to serve as a linkage between the pastoral community and external agents. This person is called nabaddoon, peace maker or seeker. The nabaddoon carries proposals (for example development projects, research studies, etc) from an external agent to the pastoral community leaders. The proposals are studied by the religious and community leaders in a series of meetings. Before they reach any conclusion, they call a general meeting for the community members to reach a final judgement. The decision is passed to the external agent through the nabaddoon.

Figure 4

Management decision such as movement of livestock from one place to another are made by pastoral community members with the consent of their leaders. Religious meetings are traditional and generally decided by religious leaders. Decisions concerning security between clans and subclans or within kin groups are made by the governing body. If when foraging, farming, or watering, disputes arise, the pastoral community members report to their leaders. The leaders thoroughly study the issues. They dispatch a fact finding mission. When the mission returns, the leaders either make their own final judgement or call a general meeting for the community members (depending upon the seriousness of the dispute), reaching a verdict on the spot or later. They always try to avoid external involvement in solving their problems, even if the dispute is between two rival clans.

Clan coherence is relatively strong in Ceeldheer pastoral society. Ceeldheer pastoralists have centralised authority within as well as outside the clan. Although their community leaders have full authority in decision making, they share this power with other clan members, including young camelmen.

X Summary

This paper has tried to show that Ceeldheer camel owners are rational and goal-oriented in their livestock husbandry and management. They are aware of the need to conserve their grazing lands, and are highly cognizant of the benefits to be gained from their camels. The great attention they pay to productivity, endurance, drought and disease resistance in selecting breeding stock are indications of wise traditional management. Camel raising within the pastoral system is an arduous enterprise. Its viability can be easily destroyed as the system itself is subjected to increasing pressure from within and from outside. However, camel pastoralism is the only efficient way of exploiting most of Ceeldheer District, where cultivation is almost impossible because of the nature of the soil and vegetation. Farming and intensive livestock breeding do not seem

appropriate at this moment, and if adopted would only lead to irreversible destruction of the existing pastoral-vegetation-animal equilibrium. The creation of sufficient economic development to provide alternative permanent employment in the pastoral areas like Ceeldheer District is not feasible either now or in the near future. It is, therefore, important to identify successful means for improving and preserving camel pastoralism as the base for future development. To achieve this, integrated research that accounts for the customs, lifestyle, internal logic - both social and economic - of the pastoralists' system is necessary.

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