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Camel Production Practice in West Hararghe Zone, Oromia Region, Ethiopia

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ABSTRACT

Background: Dromedary camels are major component of the agro-pastoral systems in vast pastoral areas in arid and semi-arid area of Ethiopia due to highest icon of adaptation to challenging ways of living. But little is known about its production practice and production systems compared to other domestic animals. Therefore, the current study was aimed to assess camel production practice in West Hararghe zone, Oromia Region, Ethiopia.

Methods: The research was conducted during the period of 2018-2019 using two potential districts (Mieso and Bordede) which have large number of camel populations. Semi-structured questionnaires were used to collect data regarding camel production practice.

Result: Based on the data collected the major feed resource in the study area both in Bordede (56.7%) and Mieso (40%) was browse species. The sources of water for camels were river (53.3) and well water (51.7%) in Bordede and Mieso districts, respectively. About 61.67% and 91.67% of respondents in Bordede and Mieso respectively kept camel overnight in yard. The major constraints in the study area were shortage of feed and water especially during dry season in both districts.

Key words: Camel, Production practice, West Hararghe.

INTRODUCTION

Dromedary camels are major component of the agro-pastoral systems in vast pastoral areas in arid and semi-arid area of Ethiopia due to highest icon of adaptation to challenging ways of living in arid and semi-arid region (El-Agamy, 2006). Poor management practices in the regions where most camels are raised, adversely affect its reproduction and productive performance (Kaufmann, 2005). Camel production could be a profitable business enterprise for utilizing the vast arid and semi-arid areas of Ethiopia where other animals prosper with difficulty, especially due to the frequent occurrence drought conditions. Camels contribute significantly to the livelihood of the pastoralists and agro-pastoralists living in the fragile environments (Tura *et al.* 2010).

Despite the camel's considerable contribution to food security in semi dry and dry zones and its being a major component of the agro-pastoral systems in vast pastoral areas, little is known about its production practice and production systems compared to other domestic animals. Researchers and funding agencies have been very unwilling to act on camel research for improvement of their production. Information on camel production practice especially in West Hararghe Oromia region of Ethiopia is very limited. Therefore; the study was conducted in West Hararghe Zone Oromia Region, with the objective of Camel Production Practice.

MATERIALS AND METHODS

Description of the study area

The study was conducted from March 2018-September 2019 in West Hararghe Zone of Oromiya National Regional State, Ethiopia. West Harargе is one of the Zones in the Ethiopian Region of Oromiya.

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Sampling procedures and data collection

Both primary and secondary data were collected. Primary data sources were the household heads in the respective districts whereas the secondary data were collected from Bordede district Agricultural Office and Mieso district Agricultural Office.

Two districts were selected purposively, from each district 3 kebeles were selected purposively based on camel production, accessibility of the kebele's, area coverage and representativeness for the study areas. The target sampling population was the households who have camel herds in the selected kebeles. The sample size was decided to be 120 household heads (*i.e* 20 households from each kebeles) taking into consideration the limited resources and time available to conduct the study.

Information was collected using semi-structured questionnaire. For conducting the field survey, six

enumerators who have the knowledge about the area and well acquainted with the culture and local language were recruited and "trained" on the methods of data collection and contents of the interview. The survey was focused on camel feed resources, water resources and watering frequency, housing, breeding and health aspect.

Data management and analysis

Data collected from Survey was summarized on Microsoft excel sheet and analyzed using SPSS (statistical package for social science, version 20).

RESULTS AND DISCUSSION

Household characteristics and responses

Most of the respondents in Bordede (53.33%) and Mieso (46.67%) district were illiterate and the remaining got only primary school education and Kuran (Table 1). This proportion is lower than the report of Solomon (2010) and Yohannes (2006) who reported that 95% in Borena and 82% in Jijiga, were illiterate, respectively.

Herd composition

During the study it was found that camels, cattle, goats and sheep were the types of livestock reared by pastoralists in the study districts (Table 2). On average there were larger numbers of camels and goats both in Bordede (29.3, 23) and Mieso (15.4, 8.5) districts, respectively than other type of animal per household.

The findings of the present study on livestock composition were comparable with the studies of Yohannes (2006), Eyassu (2009) and Ishag (2009). Simenew *et al.* (2013) also concluded that camels, cattle, goats and sheep were the types of livestock reared by Somali pastoralists.

Table 1: Educational status and marital status of the respondent (N=120).

Variables	Bordede (N=60)%	Mieso (N=60) %	Overall mean (N=120)
Educational status of HH (mean)			
Illiterate	53.33	46.67	50.00
Read and write	46.67	53.33	50.00
Marital status of HH			
Married	71.67	85.00	78.34
Single	23.33	8.33	15.83
Polygamous	5.00	6.67	5.84

N= Number of respondents; HH= Household.

Feed and water resources

Feed resources

As presented in Table 3, the major feed resources for camel both in Bordede (56.7%) and Mieso (40%) districts were browse species. The current finding is in line with Simenew (2014), who stated that feeding practices in Afar camel production system was browsing 43.6% and browsing and mineral supplementation 56.4%. In addition to this, as indicated by Beruk (2000) the use of improved forage and supplementary feed by the pastoralists in the Afar region is insignificant, rather the primary feed sources of livestock in the region were the rangelands composed of indigenous species of grasses, shrubs and fodder trees.

As presented in Table 3 majority of the respondents in Bordede (68.3%) and Mieso (75%) did not provide supplementary feed for their camels. But the rest one provides mineral soil supplementation (soil salt). Soil salt, locally known as *haya*, is used by 31.67% and 25% of the respondents in Bordede and Mieso respectively during the wet as well as the dry season. However, the respondents indicated that the frequent use was made in the dry season to compensate the feed shortage. If water is available in the area, provision of *haya* in dry season is preferable; otherwise, more was used during availability of water in wet season. They feed *haya* by taking the animals to salt area or by taking the salt to their homesteads. The respondents believed that the camels that lick salt get strong during the dry season and improve milk production. This type of feeding of salt was also reported by Ahmed (2002) in the Somali region that herders travel to their potential salt rich areas when the dry season approaches or pastoralists transport salt to their dwelling sites.

Based on the data obtained all pastoralists were encountered feed shortage especially during dry period. Similarly, Abidisa *et al.* (2017) reported that all households in Yabello district encountered shortage of feed especially during the dry period. Impact of feed shortage on camels was also provided by the respondents. Death of calf, reduced milk production, reduced the body weight and abortion.

Table 2: Overall species composition of herds in Bordede and Mieso district.

Animal type	Study district					
	Bordede (N=60)		Mieso (N=60)		Total (N=120)	
	Mean	Std.	Mean	Std.	Mean	Std.
Cattle	18.4	12.6	7.5	5.5	13.0	11.2
Camel	29.3	34.2	15.4	13.5	22.3	26.8
Milking camel	7.5	6.4	5.1	4.0	6.3	5.4
Goat	23.0	37.0	8.5	8.6	15.8	27.8
Sheep	7.6	10.0	3.5	4.8	5.7	8.2

N= Number of respondents.

Sources of water and watering frequency

According to the present study, the source of water for their camels is mainly River (53.3%) in Bordede and well water (51.7%) in Mieso district (Table 4). However, the availability of these water resources depends on the season and distance from the temporary settlements of pastoralists. The study conducted by kedja (2007) in Mieso district indicated that the water sources for livestock's include rivers (78%), springs (65%), ponds (36%), wells (18%), lake (7.5%) and pipe water (5%). The study of Abdisa *et al*. (2017) in Yabello district indicated that 75.00% of the respondent's source of water for their camel was form ponds and 80.83% of the respondent's supply water once per week.

As shown in Table 4 about 36.7% of the respondents in Bordede district supply water once per week for their camel. This is in line to the report of Ayanle (2019) majority of the respondents, 57.4% convinced that frequency of watering their camel is every ten days. However 35% of the respondents in Mieso district supply water once per two week, this result agree with the report of Ayanle (2019) 40.0% of respondents water every fifteen days in Degahbour Woreda, Jarar Zone. This is due to the scarcity of water resources and also to reduce water loses by the animals, then the animals might develop physiological mechanism to use efficiently.

Most of the water sources are found about 1 to 30 km from pastoralists' settlement depending on the season. As a result, the seasonal availability and distance of the water sources have implications on watering frequency. Coppock (1994) reported that, there is high degree of water restriction of cattle during the dry seasons and animals may be watered once every three or four days in Borana.

As the survey result revealed that the main water related problems in the study area were water shortage (54.17%), poor sanitation (33.34%) and distance (29.17%) which influence the camel milk productivity. Water scarcity was the most series factor for camel production as per the majority of the respondents 'opinion. It is a critical problem

Table 3: Feed resource in the study area (percent of respondents).

Variables	Bordede (N=60) %	Mieso (N=60) %	Overall mean (N=120)
Feed resources			
Native browses (trees and shrubs	56.7	40	48.35
Native grass	13.3	21.7	17.5
Plant roots, tubers and pods	30	38.3	34.2
Mineral supplementation			
Yes	31.67	25	28.34
No	68.3	75	71.65
Is there feed shortage?			
Yes	100	100	100
No	-	-	-

N= Number of respondents.

Table 4: Source of water, season of availability and watering frequency in the study area.

Variables	Bordede (N=60) %	Mieso (N=60) %	Overall mean (N=120)
Water resources			
River in wet and dry season	53.3	15.00	34.15
Well in wet and dry season	6.70	51.70	29.20
Pond in dry season	40.00	33.30	36.65
Watering frequency			
Every day	8.30	3.30	5.80
Once two days	1.70	18.30	10.00
Once in three days	35.00	11.70	23.30
Once in a week	36.70	13.30	25.00
Once in two weeks	0.00	35.00	17.50
Once in a month	18.30	18.30	18.30
Water related problem			
Distance	36.67	21.67	29.17
Scarcity	51.67	56.67	54.17
Unhygienity	11.67	21.67	33.34

N= Number of respondents.

during the short rainy/dry season due to the fact that most of the family members became busy for searching water for their livestock and their home consumption. So, the pastoralist community as well the livestock supposed to move far distance to search and access to water, this result is in line with previous literature report Wilson (1998).

Camel housing

As shown in (Table 5) majority of respondents in Bordede (61.67%) and Mieso (91.67%) kept camel overnight in *kraal* (Yarded). The study indicated that most of the respondents in Bordede (68.33%) and Mieso (38.33%) did not clean the camel house. In Borona zone all of the camel breeders kept their animals in *kraal* made up of thorny bushes to protect the animals from some predator (Dejene, 2015).

Camel breeding

The mating type followed by most of the respondents was either herd mating or mating using selected camel bull by allowing it continuously with she camels for Both Bordede and Mieso district. The most mating time of camels both in Bordede and Mieso district was wet or rainy season (Table 6). Camel breeding starts at the beginning of the rainy season and continues throughout the season. Similarly Somali camels around Jijiga and Shinille are bred mostly during the wet season between April/May and September (Tezera and Belay, 2002). This finding is also in agreement with those of Dioli *et al.* (1992), Tezera (1998), Zeleke (1998) and Farah *et al.* (2004) who stated that camels are bred mostly during wet season, however, some of them in dry season and few of them in both seasons.

The type of breeds found in the study area was local breeds and the breeding technique that the respondents follow was natural breeding technique. Culling is one the practice of camel herders and there were different reasons of culling, out of this the major one is health aspect (sickness), low milk production and other minor reasons such as older age and infertility *etc.*

Camel health care

Disease problems

Majority of respondents both in Bordede and Mieso district have access to animal clinic but, respondents were asked to identify the prevailing diseases in their respective districts and the diseases are listed accordingly (Table 7). A number of camels have been lost due to diseases. Anthrax (60%), mastitis (30%) and brucellosis (18.33%) were the major diseases of camels in Bordede and the most important diseases in Mieso were Anthrax (31.67%), mastitis (31.67%) and camel pox (18.33%).

It is well known that disease is one of the most important factors that negatively affect camel production and productivity. Diseases pose a major threat to camel production and reproduction by causing mortality and morbidity in study area. The extent of losses due to diseases was very high as compared to losses due to other causes. The study conducted by Yohannes (2006) indicated that camel pox (63.33%), anthrax (61.67%) and parasites (53.33%) were the major disease of camel in Kebribeyah woreda of Jijiga zone.

Table 5: Type of camel house and cleaning frequency in the study area.

Variables	Bordede (N=60) %	Mieso (N=60) %	Overall mean (N=120)
House type			
Backyard	11.67	-	5.84
Yarded	61.67	91.67	76.67
Open camp	26.67	8.33	17.50
Cleaning practice			
Daily	21.67	30.00	25.84
Once in 3 day	8.33	11.67	10.00
Once in a week	1.66	20.00	10.83
Not cleaned	68.33	38.33	53.33

N= Number of respondents.

Table 6: Mating period of camel.

District	Mating period of camel				
	Year round	Rainy	Dry	Seasonal	Total
Bordede (N=60) %	11.67	40	26.67	21.67	100
Mieso (N=60) %	3.33	53.33	13.33	30.01	100
Total (N=120)	7.5	46.67	20	25.84	100

N= Number of respondents.

Table 7: Most important disease in the study area.

Variables	District		
	Bordede (N=60) %	Mieso (N=60) %	Overall mean (N=120)
Access to clinic service			
Yes	68.33	80.00	74.17
No	31.67	20.00	25.84
Type of disease			
Camel pox	6.67	18.33	12.50
Anthrax	60.0	31.67	45.84
Mastitis	30.0	31.67	30.84
Abortion	18.33	3.33	10.83

N= Number of respondents.

CONCLUSION

Camel is one of the most important livestock for the livelihood of pastoralists in study area. Without camel it is difficult to overcome the prevailing harsh environmental conditions. However, the camel production in the study area was constrained by feed shortage, water shortage and disease. Camels are usually herded during the daytime on communal grazing lands and kept during night in yard around homesteads or settlements as protection from predators and thieves/raiders.

RECOMMENDATIONS

Based on the findings of this study the following recommendations are forwarded:

- To improve and enhance the camel production, the district livestock and development office and other stakeholders should jointly move shoulder to shoulder to introduce a new technology and strength the capacity of pastoralists and agro pastoralists in feed conservation like hay making and silage.
- To eradicate or reduce the prevalence of diseases in the study area development actors should give due emphasis in improving the veterinary services and provision of quality veterinary drugs for the major diseases.
- Water scarcity was the main problem for livestock in the study areas, therefore community based dams or ponds should be constructed to reduce water shortage.

Conflict of interest: None.

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