

Cost of production, marketing and revenue generation from somali camel breed in Isiolo and Marsabit counties of northern Kenya

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Abstract

This study was carried out in Isiolo and Marsabit Counties of northern Kenya to understand the marketing and profitability potential of Somali camel reared for milk and beef. The study involved a survey where 91 and 120 randomly selected respondents were individually interviewed in Isiolo and Marsabit, respectively using a semi-structured questionnaire. The data was analyzed using the IBM SPSS where independent samples t-test was carried out on quantitative data while, descriptive statistics were carried for the qualitative data and test for significance done using chi-square.

Market price for camels ranged from KES. 12,500 for male calves under one year to KES. 97,143 for mature females and were within the range reported by other researchers. The prices were higher in Isiolo than Marsabit for mature males which sold for KES. 55,971±3,637 and KES. 39,682±3,333 ($p=0.038$) respectively, but not in other age categories. Majority of the respondents (90.6%, $n=77$) in Isiolo estimated market value of camels before taking to the market compared to 67.7% ($n=65$) in Marsabit, suggesting Isiolo pastoralists were keen to know the market value before taking camels to the market. The commonly used method for estimating market value of camels was ocular assessment of the body size in combination with market information. Isiolo pastoralists spent more money on inputs such as antibiotics, acaricides and, herding labor and also sold more milk than their Marsabit counterparts ($p=0.049$).

In terms of revenue generation, pastoralists were making KES. 10,292 and 4,888 every month in Isiolo and Marsabit, respectively from sale of live camels and the milk. The fast expanding commercial rearing of Somali camels in peri-urban Isiolo and Marsabit was profitable to pastoralists.

There however appeared to be a variance between actual market value of camels and the price offered to farmers in the market suggesting some degree of exploitation by middlemen although no data was collected from the middlemen to validate this opinion. Considering the KES. 10,000 pastoralists were getting in Isiolo was based on the traditional management of the camel, it means the potential profitability of commercial rearing of the camel is much higher and could be exploited through training on improved camel management technologies.

Key words: *camel milk, camel meat, profitability, capacity building, improved management technologies*

Background

Camels have traditionally provided milk, meat, blood for subsistence and have had socio-cultural values among the pastoral communities of Kenya (Field 2005, Guliye et al 2007, MoLD 2007, Mehari et al 2007a, b; Mahmoud 2010). The unique physiological, morphological and anatomical features including reduced water requirements and ability to yield milk throughout the year with or without drought makes camel the livestock species of choice in climate adaptation and resilience (Field 2005). In the recent past, camel rearing in Kenya has been increasingly gaining commercial value, especially under the emerging peri-urban production system (Matofari et al 2007, Noor et al 2012). In 2011, camel milk production in Kenya was estimated at 553 million litres (7% of the national total) worth about KES. 16 billion (Behnke and Muthami 2011) and in the same year, camel meat worth KES. 54 billion was sold. The expanding market-oriented camel production presents opportunities for poorer households to enhance their food and income security (SRA 2004).

That the camels have continued to replace cattle in Isiolo County was confirmed by a pastoralist Abdi Maalimin at Kachiulu area in an article carried out by the Mediamax People daily Kenya (2015) who said *“life has been good since I turned to camel rearing in 1988”* noting that *‘camel copes well in the arid and semi-arid conditions unlike the cow that needs constant supply of water. The camel drinks less water and is able to survive for days without quenching its thirst. Besides, the camel feeds on shrubs available in the region as opposed to cattle that feed on grasses’*.

The Somali camel breed in particular produce more milk, is heavier and produces more meat, fetch higher price in the market and has higher load capacity compared with the other breeds of camel in Kenya (Hulsebusch and Kaufmann 2002, Njanja and Oba 2011). Considering that feed resources will become scarcer in future owing to climate change and human activities, it makes sense to keep few but more productive animals and the Somali camel fits this requirement in the peri-urban arid areas of Kenya. This study sought to understand cost of production, marketing and estimated potential profitability of Somali camel rearing in northern Kenya as a business. The study was part of a bigger baseline study before interventions aimed at promoting rearing of Somali camels for business and as climate change adaptation strategies.

Methodology

The survey was undertaken in the Counties of Isiolo and Marsabit in northern Kenya where a total of 91 and 120 randomly selected respondents were individually interviewed in the two counties, respectively. A semi-structured questionnaire was used to gather the data from respondents drawn from three purposively selected divisions in Isiolo namely; Oldonyiro, Isiolo Central, Kina and three in Marsabit namely; Torbi, Maikona and Gadamoji. In each division, a myriad of purposively selected villages with high concentration of Somali camels were sampled. The sampling frame was from a list of all the pastoralists owning Somali camels in each village selected. In total, 14 villages were sampled in Isiolo and 7 in Marsabit. The interviews were conducted by carefully selected and trained enumerators under close supervision by the research team.

Data analysis

The data was entered, cleaned and analyzed using the IBM SPSS statistics version 20 (2011). Independent samples t-test was carried out on quantitative data while descriptive statistics were

carried on the qualitative data and test for significance done using chi-square where applicable.

Results and discussion

Camel market prices

Table 1 presents the results of market prices of different age class in the two Counties. The findings show the prices of camels in Isiolo were relatively higher than in Marsabit except for mature females ($p=0.095$).

Table 1. Market Prices of Camels in Isiolo and Marsabit in the year 2014

Categories of camels	Sex	Sites	Sale price ($\mu \pm SE$)	Sig. (t)
Calves < 1 year	Male	Marsabit	12,500 \pm 2,500	0.326(ns)
		Isiolo	14,775 \pm 846	
	Female	Marsabit	20,000 \pm 1,104	0.887(ns)
		Isiolo	22,856 \pm 1,531	
Weaners (2 – 3 years)	Male	Marsabit	17,714 \pm 1,936	0.139(ns)
		Isiolo	24,672 \pm 1,172	
	Female	Marsabit	30,000 \pm 5,385	0.701(ns)
		Isiolo	37,015 \pm 1,424	
Mature camels (>3 years)	Male	Marsabit	39,682 \pm 3,333	0.038(**)
		Isiolo	55,971 \pm 3,637	
	Female	Marsabit	97,143 \pm 34,531	0.095(ns)
		Isiolo	77,657 \pm 13,600	

ns – Not significant; ** - Significant

The high price of mature Somali female camels in Marsabit may suggest higher demand for this category than the supply. This could be as a result of the current high promotion interventions for Somali camel rearing within the County by many development partners as well as the reported increased preference of the camel during the FGDs. Many new livestock keepers tend to go for females which may also partly explain the high demand observed for this category. The higher camel prices in Isiolo were expected since Isiolo is more accessible and has a higher number of camel meat consumers compared to Marsabit. The findings of this study regarding prices in both Isiolo and Marsabit closely relates to the report by Mahmoud (2013). Mahmoud observed that rising demand for camel meat in Arab countries had also pushed up prices of the animal in North Eastern Kenya and Nairobi markets. He also reported that consumers in Arab countries preferred camel meat from the horn of Africa, which is said to be sweeter compared to meat sourced from the vast global market segments such as Europe, Australia, and USA. Further, Mahmoud reported the camels were being sold at between KES.70, 000 and 80,000 in Garissa market, between KES.90, 000 and 100,000 in Moyale market, and KES.80, 000 in Nairobi market. The demand of camel meat in Arab region mainly in Saudi Arabia is high attracting importers to source for camel from the horn of Africa through Ethiopia, Djibouti, and Northern Somalia where it has also been noted that traders in these markets were sourcing camels from northern Kenya (Mahmoud 2013). The prices reported in this study were however much higher than those reported earlier by Noor et al (2013) for all classes of camels suggesting fast improving fortunes for camel pastoralists. Overall, these dynamics presents a golden opportunity for pastoralists in northern Kenya to not only rear the camel as a business enterprise but also address the challenges of climate change by adopting the large bodied Somali camel breed. Most of the pastoralists (90.6%, $n=77$) estimated market value of camels before taking to the market in Isiolo. The commonly used method for estimation was visual assessment of body size in combination with market information (85.9%, $n=55$). In Marsabit, 67.7% ($n=65$) of respondents did estimate using the same method. The remaining proportions of

pastoralists did not do price estimation and this could be a result of lack of information or knowledge on this. The results suggest Isiolo pastoralists were keener to have an idea of the market value before taking camels to the market compared to Marsabit. The possible reason for this practice was that in Isiolo there is a high level of commercialization of camel rearing and the decision to sell camels is possibly informed by the market demand while in Marsabit, household needs could still be a significant decisive factor in the camel marketing (McPeak and Little 2006). Failure to have an idea of market value pre-disposes pastoralists to exploitation by middlemen and brokers who have been reported to constitute up to 50% of the participants in some camel markets (McPeak and Little 2006). The reported method used by the pastoralists to estimate the market value was less accurate, a challenge that would need to be addressed through capacity building. There is need to expose and demonstrate to the pastoralists other existing simple but more accurate methodologies of estimating market value of camels to enhance their bargaining power in the market.

Cost of production and revenue generation

The data presented in Table 2 clearly shows that in terms of inputs, the Isiolo pastoralists were spending more money on all the inputs than their Marsabit counterparts ($p < 0.05$). This demonstrates that the level of commercialization of camel milk production is much higher in Isiolo compared to Marsabit.

Table 2. Average Household Cost of Producing Camels and Revenue Generated in Isiolo and Marsabit in year 2014. Average Annual Production Costs

Type of Input	Sites	Quantity ($\mu \pm SE$)	Sig.(t)	Cost (KES) ($\mu \pm SE$)	Sig.(t)
Antibiotics (Litres)	Isiolo	57 \pm 46	0.278	2,722 \pm 628	1.78(ns)
	Marsabit	43 \pm 12		1,505 \pm 268	
De-wormers (Litres)	Isiolo	55 \pm 52	0.203	2,002 \pm 542	0.416(ns)
	Marsabit	41 \pm 30		1,693 \pm 510	
Acaricides (litres)	Isiolo	18 \pm 12	0.313	2,244 \pm 376	0.049(**)
	Marsabit	14 \pm 5		2,218 \pm 365	
Mineral supplements (Kg)	Isiolo	169 \pm 23	0.162	3,784 \pm 584	3.145(ns)
	Marsabit	150 \pm 35		1,590 \pm 381	
Herding labor (Man days)	Isiolo	298 \pm 157	0.069	25,791 \pm 4,246	3.836(ns)
	Marsabit	270 \pm 122		7,647 \pm 2,085	
Water (litres)	Isiolo	806 \pm 183	0.053	9,962 \pm 2,249	0.050(**)
	Marsabit	695 \pm 157		7,004 \pm 1,672	
Totals	Isiolo	-		46,555	
	Marsabit	-		14,653	
Average Annual Revenue Generated					
Live camel sales (Numbers)	Isiolo	5 \pm 1.0	0.09	86,355 \pm 8,582	1.343(ns)
	Marsabit	3 \pm 0.7		72,310 \pm 5,979	
Milk sales (Litres)	Isiolo	1,784 \pm 992	-	83,700 \pm 25,406	-
	Marsabit	-		-	
Totals	Isiolo	-		170,055	
	Marsabit	-		72,310	
Annual Surplus Revenue					
Indicative Profit Margins	Isiolo	-		123,500	
	Marsabit	-		57,657	

*ns – Not significant; ** - Significant*

Pastoralists in Isiolo could afford to spend more since they were at higher level of commercialization than those in Marsabit. It had also been noted that the Somali camel population was higher in Isiolo than Marsabit. Moreover, expenditure on production inputs is dependent on herd sizes explaining the relatively higher figures for Isiolo. Notably though, pastoralists in both sites were indeed spending money in buying inputs for production. This finding compares favorably with that of Hesse and MacGregor (2006) in Ethiopia where the author reported that 37% of the income generated through destocking during drought period was spent on livestock health care and feeding.

Camel offtake and milk marketing

The overall camel offtake in Isiolo was about 15%, much higher than 4% reported earlier for general livestock among pastoral communities by (McPeak and Little 2006, Were 2009) but lower than figures reported by Noor et al (2013) for steers and breeding males in the same County. Dividing the money raised by the number of camels sold gives an average price of about KES 24,000 in Marsabit and KES. 17,000 in Isiolo, respectively, suggesting that the pastoralists were either selling the middle aged male camels or were not getting the actual market value where mature camels were sold based on prices in Table 1. The pastoralists certainly need more training on pricing and how they can work out realistic estimate of market value of camels before taking them to the market.

The proceeds from milk sales were as high as those from live camel sales especially in Isiolo. This finding was consistent with McPeak and Little (2006) who reported that, in northern Kenya the total value of milk exceeds that of meat in the pastoral economy by more than double. Unfortunately data for milk sales was unavailable in Marsabit County.

Based on surplus revenue figures presented in table 2, pastoralists were getting KES. 10,292 and 4,888 per month in Isiolo and Marsabit, respectively, from the sale of camels and milk. There is potential to significantly improve these figures through capacity building of the pastoralists on improved Somali camel management. This suggests there is indeed money in camel rearing in Isiolo and Marsabit Counties.

Conclusion

The study findings reveal that commercialization of camel rearing within the peri-urban Isiolo and Marsabit is indeed a sustainable enterprise and can be rewarding to the farmers from the sale of live camels as well as milk. However, there seem to be a variance between the actual market value of camels and the price offered to farmers in the market suggesting the farmers were perhaps being exploited by other market players. This would need to be addressed in order to motivate pastoralists to fully commercialize camel rearing activities. Given that pastoralists were managing the Somali camel using their indigenous knowledge, and managed to make KES. 10,000 per month in Isiolo, suggests that there is a greater potential for higher profits if pastoralists are trained on improved camel management technologies.

Acknowledgement

The team highly appreciates the Intergovernmental Authority on Development (IGAD) for funding the study through its Applied Research in Dry Lands Grant Facility (ARDGF). The team treasures the facilitation of field activities by the project principal investigator, Professor Jesse T. Njoka of University of Nairobi-Centre for Sustainable Dry Land Ecosystems and Societies. Further, the team sincerely regards the support by County Director of Livestock Production, Isiolo and coordinator for Pastoralists Community Initiative and Development Assistance (PACIDA) Marsabit who unreservedly mobilized the respondents for data collection working in conjunction with the local leaders. Finally, the team cannot afford to ignore the cooperation by the respondents which made collection of quality data possible.

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Received 15 July 2016; Accepted 22 October 2016; Published 1 December 2016

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