SHOATS MILK CONSUMPTION AND THE ASSOCIATED FACTORS IN ARID AND SEMI-ARID LANDS OF KENYA, A CASE OF MWALA SUB COUNTY IN MACHAKOS COUNTY

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Abstract
The purpose of this study was to access factors affecting goat and sheep milk consumption in the study area. A descriptive survey research design utilizing structured questionnaires, Focus Group Discussions (FGDs) and case narratives was used to collect data. About 81.7% of the respondents in the study area had tested goat milk compared to only 5% for sheep milk. On consumption, 68.3% took goat milk while only 0.8% had consumed sheep milk. About 56% and 34% of goat milk consumed was in boiled and raw forms respectively. About 37% consumed goat milk daily while none consumed sheep milk daily. Strong smell (16.7%), scarcity (5.8%) and lack of interest (14.2%) were the main factors affecting goat milk consumption while unavailability (17%), lack of interest (78%) and religious beliefs (2%) affected sheep milk consumption in the study area. Overall goat milk was widely consumed than sheep milk.

Key words; milk, goat, sheep, consumption, factors

1.0 Introduction

Goats and Sheep play a vital role in the livelihoods of small-scale farmers in developing countries. They contribute to food security and can alleviate seasonal food variability and availability directly through milk and meat production and indirectly through cash earned from the sale of their products (Homann *et al.,* 2007).

In semi-arid areas goats and sheep have comparative advantages over cattle. Since they are more resistant to droughts, they utilize a wider diversity of plants and or grass and their higher reproductive rate allows populations to recover quickly. As browsers they use different vegetation than cattle and thus allow farmers to make more efficient use of the available natural resources. In addition, goats play an important socio-cultural role. Promoting goat/sheep production contributes to risk mitigation, particularly in drought-prone areas, and empowerment of vulnerable groups (Women, HIV/AIDS, poor) (Delgado *et al.*, 1999).

Milk has a wide spectrum of nutrients composing of proteins, vitamins and minerals. The most predominant milk is that from the cow. However, milk from sheep and goats has been accepted in most parts of the world, especially in the developed countries as an alternative to cow milk (Ochepo *at el*., 2010).

According to Jennes (1980), goats produce relatively more milk compared to cows and other ruminants, because of better feed utilization efficiency, higher lactation persistency, mammary tissue comprising of greater proportion of the body weight and a more pronounced milk ejection reflex. Goat and more so sheep milk production are not popular in Kenya; many households keep goats and sheep for other economic gains and not for milk as such.

1.1 Statement of the Problem

Goats and sheep are deeply embedded in almost every African culture and are true friends to the rural poor and yet have received very little attention by African governments and there is little investment in their development (Peacock, 2005). Goat milk constitutes around 2.2% of the world's total milk production, sheep milk 1.3% and camel milk 1.3%.

According to FAO**,** 2011, Kenya had 13,966,000 goats excluding sheep and they produced 124,300,000kgs of milk accounting for 3.82% of the annual milk production for 2007. Despite the potential for the goats and sheep production in the face of the changing climate and the many nutritional benefits of the goat and sheep milk, consumption is very low. Goat and sheep which are good sources of animal protein in terms of meat and milk are available in Kenya. However, their milk which is produced continuously over the lactating period of about 120 days is rarely consumed and ideally left for the Kids and Lambs to suckle.

Notwithstanding their milk benefits, few studies have been conducted on the factors that affect the consumption of Goat and Sheep Milk in Arid and Semi-Arid Lands of Kenya. Therefore this study assessed the factors, both socio-cultural and or husbandry that affect the consumption of Goat and Sheep milk among the communities in the Arid and Semi-Arid Lands of Kenya with specific reference to Kyawango and Mukaa Locations of Mwala Sub County in Machakos County.

1.2 Methodology

The study was conducted in Mwala Sub County which is part of Machakos County. Machakos County is one of the 47 Counties of Kenya (Hubpages inc, 2013). It lies between latitudes 0.45'S and 1.31'S and longitudes 36.45'E and 37.45'E and has a total area of 6,850 km^2. The region receives bi-modal rainfall ranging from 700 - 900 mm/annum and mean temperature of between 17 - 24^oC.

The study population consisted of smallholder farmers from the study area. Livestock, both of indigenous and exotic cattle and goats are kept. Main indigenous breeds include Zebu cattle and the small East African goats. Main exotic goats' breeds include Toggernburgs and Germany Alpines.

The study used descriptive survey Research design. A Simple random sampling procedure was used. This method was preferred because it ensures that all members of a population have an equal chance of being selected for study (Mugenda *et al.*, 2003). The two Locations have a total population of 7689 households (Kenya National Bureau of Statistics, 2009). The researcher used a sample of 120 respondents as supported by Kathuri *et al.*, (1993) who contends that a minimum sample of 100 is sufficient to infer the whole population. The extra 20 respondents were necessary to cater for attrition. With this, each division gave 60 respondents chosen randomly.

Both primary and secondary data sources were utilized during the research. Structured questionnaires were used to collect quantitative data, while Focus Group Discussions (FGDs) and

case narratives were used to collect qualitative data. This was done using a Checklist. Data analysis was done using the Statistical Package for Social Scientists (SPSS) and Simple descriptive statistical measures such as percentage, frequency, mean, mode and median were generated and presented in tables and graphs.

1.3 Results and discussion

1.3.1 Population demographics

Respondents' age, gender, household composition, religion and their levels of education were examined and findings were presented in Table 1.1.

Table 1.1: General characteristics of the respondents'

Variable	Frequency	Percentage
Gender of respondent		
Male	47	39.2%
Female	73	60.8%
Head of household		
Male	100	83.3%
Female	20	16.7%
Household head marital status		
Married	101	84.2%
Divorced/Separated	4	3.3%
Widowed	13	10.8%
Never married	2	1.7%
Respondents level of education		
None	8	6.7%
Primary	60	50.0%
Secondary	48	40.0%
Tertiary	4	3.3%
Number of dependents in the family		
1-2	8	6.7%
3-4	53	44.2%
5-6	40	33.3%
Above 6	19	15.8%

Table 1.1 shows that majority of the respondents in the study area were female (60.8%). Shoats being small-sized animals are easily managed by women and children and therefore women being majority of the respondents provided more elaborate information about the study area. It was further established that their male counterparts however headed most of the households in the study area as reported by 83.3% of the respondents while only about 16.7% of the households were female headed

Respondent's ages ranged between 22-77 years with an average of 46 years, an indication that all age categories were consulted in the study. Majority of these respondents were married (84%) while 11% were widowed and the rest were either single or separated. Most of the respondents had attained primary and secondary levels of education (90%) while the rest had tertiary education with a few having not gone to school. About 76.5% of the households comprised of 3-6 members with about 15.8% comprising of 6 members and above. All the respondents in the area were Christians (Table 1.1).

1.3.2 Levels of goat and sheep milk consumption

Sheep and goats not only supply nutritious and easily digestible milk and meat to households but also a regular source of additional income. To explore the levels of consumption of goat and sheep milk consumptions in the study area, the researcher first sought to understand whether the respondents had tested milk from either goats or sheep. Responses were as presented in Table 1.2.

Table 1.2: Distribution of Respondents Based on Tasting of Goat and Sheep Milk

	Goat		**Sheep**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Yes	98	81.7%	6	5.0%
No	22	18.3%	114	95.0%

From Table 1.2, about 81.7% of the respondents in the study area had tasted goat milk compared to only 5% who had tested sheep milk. This indicates that sheep milk was not commonly consumed in the study area and ascertained why goat milk is a very fast growing product in the dairy sector (Farnworth, 2002).

Information on those in the family consuming milk from either goats or sheep was also collected. It was reported that goat milk was consumed by many members in the family (68.3%) while only a few members consumed sheep milk (0.8%) as shown in Table 1.3.

Table 1.3: Distribution of Respondents Based on Goat and Sheep Milk Consumption

	Goat		**Sheep**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
No	38	31.7%	118	98.3%
Yes	81	68.3%	1	.8%

Dairy goats' farming is an important source of animal protein in the high potential areas of central Kenya highlands where land fragmentation has resulted in the formation of small pieces of land. This scenario has resulted in the rise in demand for small ruminants, predominantly the dairy goat. In many developed countries, the consumption of traditional cow milk is declining, Jennes (1980).

The different forms in which shoat's milk was consumed included raw, fermented and boiled. Majority of the respondents consumed it raw and boiled as presented in Table 1.4. A small percentage of the community in the study area consumed fermented goat milk. None of the respondents processed or packaged milk from either goats or sheep. According to research milk from goats and sheep are consumed in various forms due to their nutritional aspects. It is important to note here that measures need to be put in place to ensure that awareness creation is done to inform the community on the dangers of consuming raw milk. This is because they can have public health consequences especially when it comes to the spread of zoonotic diseases like brucellosis. Emphasis should be done in making them realize the importance of consuming processed milk mostly through boiling, Kipserem *et al.,* (2011)

Table 1.4: Forms in which goat and sheep milk is consumed

	Goat		**Sheep**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Raw	41	34.2%	2	1.7%
Fermented	1	.8%	0	0.0%
Boiled	67	55.8%	2	1.7%

1.3.3 Frequency of goat and sheep milk consumption

The researcher sought to gauge on the consumption rates of goat and sheep milk and their responses are summarized in Table 1.5.

Table 1.5: Comparison between goat and sheep milk consumption rates

	Goat		**Sheep**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Every day	44	36.7%	0	0.0%
Once per week	0	0.0%	0	0.0%
Two times per week	0	0.0%	0	0.0%
Once per month	0	0.0%	0	0.0%
Occasionally	52	43.3%	2	1.7%
None at all	23	19.2%	117	97.5%

From Table 1.5, about 36.7% of the respondents consumed goat milk daily. About 97.5% of the respondents had never consumed sheep milk. This was a clear indication that sheep milk was not very common in the study area.

1.3.4 Factors affecting goat/sheep milk consumption

Factors that affected goat milk consumption are summarized in Table 1.6.

Table 1.6: Factors Affecting Goat Milk Consumption		
Factor	**Frequency**	**Percentage**
Unavailability	7	5.8%
Strong Smell	20	16.7%
Allergy	1	.8%
Lack Of Interest	17	14.2%
None	74	61.7%

From Table 1.6, milk consumption at household level was highly affected by its strong smell (16.7%), scarcity (5.8%) and its lack of interest (14.2%). About 1% of respondents reported allergic reactions to goat milk. Kipserem *et al.,* (2011) indicates that about 57% of dairy goat milk produced in Kenya was consumed at the household level. Thus, dairy goats enable households to access milk especially for the children, sick and old. Surplus milk is sold despite the little amount of goat milk produced.

Table 1.7 Factors Affecting Sheep Milk Consumption		
Factor	**Frequency**	**Percentage**
Unavailability	20	16.7%
Unawareness	3	2.5%
Traditional Taboo	2	1.7%
Not Interested	1	.8%
Lack Of Interest	93	77.5%

Similarly, it was reported that sheep milk consumption was highly affected by its unavailability (17%) and lack of interest (78%). Interestingly, religious taboos/beliefs affected sheep milk consumption by about 1.7% of the respondents (Table 1.7).

Rubino *et al.,* (1996), reports that in developing countries like Kenya, milk constitutes an important feeding resource for the rural population. However, goats and sheep are kept on small farms for subsistence and most of the milk produced is supplied immediately to households and neighbors for personal consumption as fresh milk or processed.

1.4 Conclusion and recommendation

The level of goat milk consumption was higher than sheep milk in the study area. Goat milk was consumed daily and by majority of household members. It is recommended that extension work be enhanced targeting increased shoat milk production and consumption. Also, more awareness about the nutritional advantages of shoat milk should be created.

1.5 References

1. Delgado, C.M., Rosegrant, H., Steinfeld, H., Ehui, S. and Courbois, C. (1999): Livestock 2020: The next food revolution. Discussion Paper 28, International Food Policy Research Institute, Washington DC, USA.
2. FAO, IGAD (2011) Contribution of Livestock to the Kenya Economy. The livestock policy initiative.
3. Farnworth, E. (2002): Goat Milk – A dairy products with Special Properties. No.148
4. Homann, S., van Rooyen, A., Moyo, T. and Nengomasha, Z. (2007): Goat production and marketing: Baseline information for semi-arid Zimbabwe. International Crops Research Institute for the Semi-Arid Tropics. Pg 84.
5. Hubpages International, (2013): Counties in Kenya; Hubpages.com. Pg 2.
6. Jennes, P. (1980): Composition and Characteristics of Goat Milk. Review 1968 – 1979. Journal of Dairy Science, 63: 1605 – 1630.
7. Kathuri , N. J. and Pals, D. A. (1993): Introduction to educational research Njoro, Kenya Educational Media Centre, Egerton University
8. Kipserem, J., Sulo, T., Chepng'eno, W. and Korir, M. (2011): Analysis of factors affecting dairy goat farming in Keiyo North and Keiyo South Districts of Kenya; Journal of Development and Agricultural Economics Vol. 3(11), Pg. 555-560,
9. Mugenda, O.M. & Mugenda, G.A. (2003): Research methods Quantitative and Qualitative approaches. Nairobi, - Acts Press, 1999.
10. Ochepo, G.O. and Momoh, M. (2010): Developing the Dairy Goat Industry in Nigeria: A Review. Proceedings of 35th Conference, Nigeria Society for Animal Production. University of Ibadan, Nigeria, Pg. 530 – 532.
11. Peacock, C.P. (2005): Goats: unlocking their potential for Africa's farmers. In: FARM Africa Working Paper series.Seventh Conference of Ministers Responsible for Animal Resources, Kigali, Rwanda. Pg 3
12. Rubino, R. and Haenlein, G.F.W. (1996): Goat milk production systems: sub-systems and differentiation factors. In: Proceedings of the Sixth International Conference on Goats, vol. 1. Beijing, China, 6–11 May 1996. International Academy Publishing, Beijing, China, pp. 9–15
13. Kenya National Bureau of Statistics, 2009. Kenya population and housing census