Journal of Biology, Agriculture and Healthcare
ISSN 2224-3208 (Paper) ISSN 2225-093X (Online)
Vol.6, No.5, 2016

Assessment of Goat Production Systems and Factors Affecting Production and Utilization of Goat's Milk in Humbo District of Wolaita Zone, Southern Ethiopia

Gebreegziabher Zereu[1*] Merkine Meshka[2] Mathewos Shanka[2]
1.Department of Animal and Range Sciences, College of Agriculture, Wolaita Sodo University, P. O. Box 138, Sodo, Ethiopia
2.Humbo District Agricultural and Rural development office, Wolaita, Ethiopia

Abstract
This survey study was conducted in Humbo district of Wolaita Zone, Southern Ethiopia, with the objectives of assessing goat production systems, constraints of goat production, goat milk consumption status and factors affecting goat's milk consumption. Stepwise sampling method was employed and 103 representative households were selected. The mean landholding size was 1.8 ha (ranging from 0.25 to 7 ha). The mean total goat holding was 5.2 heads (ranging from 1 to 22 heads). Goats were reared for asset, meat production, milk production and as source of income. Extensive (55.4%) and semi-intensive (44.6%) were the two goat production systems identified. Ranked by the respondents, shortage of browsing area (1st), feed shortage (2nd), prevalence of disease (3rd) and lack of improved goat breeds (4th) were the major constraints for goat production. Goat milk consumption was not common (about 96% of the respondents did not consume goat's milk), because of different factors including culture (about 85%), lack of awareness on the importance of goat milk (9%) and low amount of goat's milk produced. Therefore, different improvement strategies that can solve the existing constraints should be employed.
Keywords: Goat, goat milk, production system

1. Introduction

Sheep and goats, being adapted to different agro-ecologies, reared by various ethnic communities and found in all production systems (Solomon *et al*., 2010), are important components of the livestock sector of Ethiopia and mainly kept for the purpose of meat, milk and wool production and income generation by smallholder farmers throughout the country (Urgessa *et al*., 2012). Goats and sheep also play a vital role in the national economy, as they are one of the major sources of foreign currency (Shimelis *et al*., 2011). Ethiopia is endowed with different indigenous goats and sheep breeds, the population being estimated at 22.6 million heads of goats and 24.2 million heads of sheep (CSA, 2012), excluding certain pastoral zones of Afar and Somali zones.

In Ethiopia, goats are preferably reared by rural low income farmers, attributed to their low cost of production, adaptability to hot environment through their dynamic feeding behavior, high fertility and growth rates and fast reproduction cycle (Tsegaye *et al*., 2013). In Ethiopia, about 16.8% of total meat supply (Ameha, 2008) and 16.7% of milk consumed (Tsedeke, 2007) is contributed from goat production. Despite the large number of goats and their contributions to the livelihood of the farmers and the national economy, goat productivity in Ethiopia is low due to different factors including shortage, seasonal unavailability, low nutritive value of feed and/or poor nutrition (Tsegaye, 2009; Solomon *et al.*, 2010); prevalence of different diseases and parasites (Tsegaye, 2009; Solomon *et al*., 2010; Tsegaye *et al*., 2013).Feed shortage is more aggravated during the dry season in both the highlands and lowlands of Ethiopia (Alemayehu, 2006) and in most parts of the country crop residues and poor quality hay are characterized by low digestibility and intake, are the major feed resources of ruminants (Nurfeta, 2010).

Humbo district is one of the 12 districts found in Wolaita Zone and it relatively has high goat population. However, there is no easily available information with regard to goat production system, constraints of goat production, utilization and factors affecting goat milk utilization. Hence, the present study was intended to contribute its part in filling this gap.

The objectives of the present study were, therefore, to assess:

- Goat production systems and constraints of goat production in Humbo district
- Goat's milk consumption status and factors that affect consumption of goat's milk in the study area

2. Materials and Methods

2.1. Description of the study area

Humbo district is the largest district among the 12 Districts in Wolaita Zone and is located at about 420 km south of Addis Ababa. The district's altitude ranges from1100-2000 meter above sea level and it has bimodal rainfall distribution from June to August and from February to May with annual rain fall of 760-1200 mm. The average temperature of the area ranges from 15-20^{0}C.Mixed farming is the dominant mode of agriculture. The food crops grown in the area include cereals such as maize, teff, haricot bean, chick pea, sorghum, barley, wheat etc and root

crops such as inset, sweet potato, cassava, yam, taro etc. Coffee, cotton, pepper, teff, fruits and vegetables are important cash crops (HDBARD, 2014).

2.2. Sampling Technique and sample size

Step wise random sampling method was employed for the study. Humbo District has a total of 40 peasant associations (PAs) of which 30 PAs are practicing goat production. Out of these 30 PAs which practiced goat production, 5 PAs were randomly selected. From each of these selected PAs households who have at least one goat were identified and accordingly a total 2066 individuals who keep goats were identified from the five Pas. Finally, 5% these populations were randomly selected for interview (Table 1).

Table 1: Number of households that keeps goats from the randomly selected five PAs of the study area and their proportional (5%) sampled respondents

Peasant associations	Total household			Sampled household (5% of the population)		
	Males	Females	Total	Males	Females	Total
Bossa Wanche	389	151	540	20	7	27
Gututo Larena	325	95	420	17	4	21
Ella Kebela	368	112	480	19	5	24
Abela Sipa	223	81	304	12	3	15
Abela Ajeja	246	76	322	14	2	16
Total	1551	515	2066	82	21	103

2.3. Methods of Data Collection

Both primary and secondary sources of data were used for the study. Primary data such as respondents' profile, land and livestock holdings, goat production systems, constraints of goat production, consumption of goat milk and factors affecting consumption of goat milk were collected from the randomly selected respondents via pretested structured questionnaire. Secondary data were collected from Humbo District Office of Agriculture, different journals, books and other relevant written documents.

2.4. Methods of Data Analysis

All the collected data were arranged, organized and analyzed by using simple descriptive statistics such as mean, frequency and percentage by using SPSS version 20 and the results were reported in the form of tables.

3. Results and Discussion

3.1. The Socio-economic characteristics of respondents

The socio economic characteristics of the respondents are presented in Table 2. As the results from Table 2 indicated, majority (79.6%) of the respondents were males while the rest (20.4%) were females. This result is in line with Guyo and Tamir (2014) who reported 81% of the respondents in Burji District, southern Ethiopia were males. Majority (88.4%) of the respondents was between the age category of 15-55 years and the mean age was 42.5 years. This result is in agreement with the Tassew and Seifu (2009) who reported majority of the respondents in Bahir Dar Zuria and Mecha districts, Northwestern Ethiopia were within the age category of 15-55 years old. The presence of large proportion the active working force (between 15-55 years old) can be an opportunities for undertaking different agricultural activities effectively (Tassew and Seifu, 2009) and this fact can be further supported as most (69%) of the households obtained their family income from different farm activities (Table 2).

Table 2: The Socio-economic characteristics of respondents in the study area

Parameters	Number of respondents (N=103)	Percentage (%)
Sex		
Male	82	79.6
Female	21	20.4
Age category (years)		
< 15	-	-
15-55	91	88.4
>55	12	11.6
Educational Status		
Illiterate	26	25.2
Literate	77	74.8
Family source of income		
Farm activities	71	69
Both farming and non farming activities	32	31

Regarding the educational status of the respondents, about 75% of them were literate while the rest were illiterate (Table 2). The presence of large proportion of literate respondents could be considered as an opportunity for easily training and accepting of improved management practice of livestock and other agricultural activities (Tassew and Seifu, 2009).

3.2. Land and livestock holding sizes of the respondents

Table 3 presents the landholding and livestock holding of the respondents. The mean land holding size was 1.8 ha. The number of exotic and cross breeds animals in the study area were very small as revealed from Table 3. The mean total goat, sheep, cattle, chicken and equine (mainly donkey) holdings per household were 5.2, 1.5, 6.3, 7.7 and 0.8 heads, respectively. This was lower than the mean holdings of 7.6, 4.4, 15.6 and 11.8 heads of goat, sheep, cattle chicken, respectively, reported by Guye and Tamir (2014) in Burji District, southern Ethiopia. Higher holdings (13.99, 6.14 and 8.45 heads cattle, sheep and chicken, respectively) but low goat holding (1.50 heads) per household were reported by Altaye et al. (2015) in Metekel zone of Benishangul Gumuz Regional State—Ethiopia.

Table 3: Minimum, maximum and average land and livestock holdings

Parameters	Minimum	Maximum	Mean	SEM
Land holding size (ha)	0.25	7.00	1.8	0.17
Number of goats				
Local	0.00	20.00	4.8	0.41
Cross	0.00	7.00	0.5	0.13
Total	1.00	22.00	5.2	0.46
Number of sheep				
Local	0.00	7.00	1.3	0.14
Cross	0.00	7.00	0.2	0.07
Total	0.00	7.00	1.5	0.16
Number of cattle				
Local	1.00	35.00	6.1	0.6
Cross	0.00	4.00	0.3	0.07
Exotic	0.00	3.00	0.03	0.03
Total	0.00	38.00	6.3	0.65
Number of chicken				
Local	0.00	25.00	5.9	0.44
Exotic	0.00	7.00	1.7	0.19
Total	0.00	25.00	7.7	0.56
Number of equines	0.00	2.00	0.8	0.06

3.3 Purpose of goat production and goat production systems in the study area

The purpose of goat rearing and goat production systems in the study area are shown in Table 5. Farmers in the study area keep goats for different purposes such as for asset, meat production, milk production and as source of income. Revealed from Table 5, about half (50%) of the respondents keep goats as an asset, while the small number (about 4%) of them keep goats for milk production and his shows that rearing of goats for milk is not common in study area. With agreement to the results of the present survey, Takele (2008) reported that, not only goats are important sources of milk but they also produce different products and by-products including meat, skins and

manure that have economic values.

Table 5: Purpose of goat production and goat production system in the study district

Parameters	Number of respondents (N=103)	Percentage (%)
Purpose of production		
As an asset	52	50.4
Source of income	36	34.9
For meat production	11	10.9
For milk production	4	3.8
Production system		
Extensive system	57	55.4
Semi intensive system	46	44.6
Intensive system	-	-

Two types of goat production systems namely extensive (55.4%) and semi-intensive (44.6%) were commonly practiced in the area (Table 5). Although, the extensive production system was the most dominant in small ruminant production systems under smallholder farmers, there were a significant number of farmers practicing semi-intensive system in the study area. Semi-intensive system was mostly practiced in midland agro-ecology of the study district where there is serious land shortage problem and hence lack of browsing and/or grazing areas. In the semi-intensive system, the goats are tethered at the garden for part of the day and taken to home and supplemented with crop by-products. The extensive system is practiced commonly in lowland agro-ecology of the district, and in this system goats are left to graze or browse throughout the day and gathered to home at night.

3.4. Constraints for goat production

The major constraints for goat production, as identified by the respondents, in the study area are shown in Table 6. Shortage of browsing area (44.7%), feed shortage (31%), prevalence of disease (17.5%) and lack of improved goat breed (6.8%) were the constraints. Different factors of which feed shortage, seasonal fluctuations and poor quality of the available feeds and prevalence of different diseases and parasites are among the major constraints for goat production in particular and livestock production in general in Ethiopia (Tsegaye, 2009; Solomon *et al*., 2010; Tsegaye *et al*., 2013).

Table 6: Goat production constraints in study district

Constraints	Rank	Number of respondents (N=103)	Percentage (%)
Shortage of browsing area	1st	46	44.7
Shortage of feed	2nd	32	31
Prevalence of disease	3rd	18	17.5
Lack of improved breed	4th	7	6.8

3.5. Goat milk consumption and factors affecting goat milk consumption

The status/habit of goat milk consumption and the factors affecting goat milk consumption of the respondents is shown in Table 7. With regard to goat milk consumption status, majority (about 96%) of the respondents did not consume milk attributed to different factors including culture (about 85%), lack of awareness of the importance of goat milk (9%) and low amount of milk produced by goats (about 7%). Compared to cow milk, goat and sheep milk have higher protein, energy and fat contents with beneficial amino acids, however goat milk is consumed only in some parts of Ethiopia, or in other words goat milk consumption is not common in all parts of the country (Tekle, 2008) and this result agrees with the finding of the present survey.

Table 7: Goat milk consumption status and factors affecting goat milk consumption in study district

Parameters	Number of respondents (N=103)	Percentage (%)
Milk consumption status		
Consume goat milk	4	3.8
Not consume goat milk	99	96.2
Factors affecting goat milk consumption		
Culture	87	84.5
Low productivity of local goats	7	6.9
Lack of awareness	9	8.6

4. Conclusion and Recommendations

The results of the present survey study showed that two types of goat production systems namely; the extensive and semi-intensive system were practiced. The mean number of goats per household was 5 heads and majority of the farmers reared goats as an asset source. No exotic goat breeds were found, and the number of cross breeds of goats found during the survey was very small. Ranked by the respondents, shortage of browsing area (1st), feed

shortage (2nd), prevalence of disease (3rd), and lack of improved goat breeds (4th) were the major constraints for goat production in the study area. Goat milk consumption status in the study were also low attributed to different factors including culture, lack of awareness of the importance of goat milk and low amount milk produced by goats.

Based on the above conclusion the following recommendations are forwarded:

- To alleviate feed shortage problem, farmers should be encouraged to cultivate improved forages through provision of planting materials and/or forage seeds
- Improving the management practices like; housing, feeding and sanitation by upgrading awareness of farmers via provision of extension services
- Genetic improvement works through crossing local goats with improved breeds should be promoted. The government and non government institution should introduce improved goat breeds and training on improved goat production practices should be promoted
- Strong extension works must be done to alleviate the problems associated with production and consumption of goat milk. Attention should be given to create awareness about the nutritional importance of goat's milk consumption.

References

Alemayehu M (2006). Country pastures/forage resource profile. Available at: http://www.fao.org/AG/agp/agpc/doc/counprof/Ethiopia/Ethiopia.htm) . (Accessed on, 2 July, 2015).

Ameha S (2008). Sheep and goat meat characteristics and quality. In: Alemu Yami and Merkel RC (Eds). Sheep and Goat Production Handbook for Ethiopia. Ethiopian Sheep and Goats Productivity Improvement Program (ESGPIP), Addis Ababa Ethiopia. Pp 323-328.

Assefa D, Nurfeta A, Banerjee S (2013). Assessment of feed resource availability and livestock production constraints in selected Kebeles of Adami Tullu Jiddo Kombolcha District, Ethiopia. Afri. J. Agric. Rese. 8(29): 4067-4073.

CSA (Central Statistical Agency) (2012). Agricultural sample survey; report on: livestock and livestock characteristics. CSA, Federal Democratic Republic of Ethiopia, Addis Ababa, Ethiopia.

Guyo S and Tamir B (2014). Assessment of Cattle Husbandry Practices in Burji District, Segen Zuria Zone Of SNNPRS, Ethiopia. Inter. J. Techn. Enhancements and Emerging Engineering Res. 2 (4): 11-26.

HDBARD (Humbo District Bureau of Agriculture and Rural Development) (2014): Socio-economic Data of Humbo Woreda.

Netsanet B, Adugna T, Girma A (2010). Livestock Production and utilization of sweet potato vines as sources of feed in two districts of southern Ethiopia. Ethiop. J.Anim. Prod. 10(1): 43-54.

Nurfeta A (2010). Feed Intake, Digestibility, Nitrogen Utilization and Body Weight Change of Sheep Consuming Wheat Straw Supplemented with Local Agricultural and Agro-Industrial by-products. Trop. Anim. Health Prod. 42: 815-824.

Shimelis D, Asmare A Wudu T (2011). Epidemiology of gastrointestinal helminthiasis of small ruminants in selected sites of North Gondar zone, Northwest Ethiopia. Ethiop. Vet. J. 15 (2), 57-68.

Solomon Gizaw, Azage Tegegne, Berhanu Gebremedhin and Dirk Hoekstra (2010). Sheep and Goat Production and Marketing Systems in Ethiopia: Characteristics and Strategies for Improvement. IPMS (Improving Productivity and Market Success) of Ethiopian Farmers Project Working Paper 23. ILRI (International Livestock Research Institute). Nairobi, Kenya. 58 pp.

SPSS (2011). Statistical Package for the Social Sciences. Vision 20. IBM Corporation, SPSS Inc., Chicago IL.

Tassew A and Seifu E (2009). Smallholder Dairy Production System and Emergence of Dairy Cooperatives in Bahir Dar Zuria and Mecha Districts, Northwestern Ethiopia. World J. Dairy Food Sci. 4 (2): 185-192.

Tassew A and Seifu E (2009). Smallholder Dairy Production System and Emergence of Dairy Cooperatives in Bahir Dar Zuria and Mecha Woredas, Northwestern Ethiopia. World J. Dairy Food Sci. 4 (2): 185-192.

Tekle Z (2008). Sheep and Goat Products and By-products. In: Alemu Yami and Merkel RC (Eds) Sheep and Goat Production Handbook for Ethiopia. Pp 275-296.

Tesfaye T (2009). Characterization of goat production systems and on- farm evaluation of the growth performance of Grazing goats supplemented with different protein Sources in Metema woreda, Amhara region, Ethiopia. An M.Sc. Thesis presented to the Department of Animal Science, School of Graduate Studies, Haramaya University. Haramaya, Ethiopia.

Tsedeke K (2007). Production and Marketing Systems of Sheep and Goats in Alaba, Southern Ethiopia. MSc Thesis submitted to University of Hawassa, Hawassa on April, 2007.

Tsedeke K (2007). Production and marketing of sheep and goats in Alaba, Southern Nation and Nationalities and Peoples Region, Ethiopia. An Msc Thesis Presented to School of Graduate Studies of Hawassa University. Hawassa, Ethiopia.

Tsegaye D, Belay B and Haile A (2013). Prevalence of Major Goat Diseases and Mortality of Goat in Daro-Labu

District of West Hararghe, Eastern Ethiopia. J. Sci. Innovative Rese. 2(3): 665-672.
Urgessa D, Duguma B, Demeke S and Tolamariam T (2012). Sheep and Goat Production Systems in Ilu Abba Bora Zone of Oromia Regional State, Ethiopia: Feeding and Management Strategies. Global Veter. 9 (4): 421-429.