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Assessment of sheep fattening practices under smallholder farmers in Genji district of West Wollega, Western Oromia, Ethiopia

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Abstract

This study was conducted in Genji district to assess sheep fattening practice, under small holder farmers in the district. The study area was stratified into midland and lowland agro ecologies followed by purposive selection of five villages based on sheep production potential and accessibility. A total of 183 households (HHs) were randomly selected from sheep producers (126 and 57 from midland and lowland agro ecologies, respectively). Each HH was interviewed with a semi-structured pretested questionnaire to collect data regarding fattening practices. Significance of difference is declared at ($p < 0.05$). In the study area, only 45.4% of the respondents keeping sheep were involved in sheep fattening. Extensive fattening was the predominant fattening system where Horro breed sheep were fattened by free grazing system with occasional supplementation by locally available feed stuffs. The sources of fattening sheep in the study area were own farm get (75.9%), market (16.9%), loan (6.0%) and gift (1.2%). The fattening period takes about 3 months after which decision to sell is made based on body condition and upcoming potential market. The most common type of sheep preferred for fattening in the study area was uncastrated ram (86.7%), followed by unproductive sheep (9.6%), castrated ram (2.4%) and old ewes (1.2%). It can be concluded that in Genji district, sheep fattening can be an important livelihood activity for small holder farmers due to availability of sheep and shorter period of fattening that needs to be initiated so as to increase sheep fattening productivity.

Keywords: Agro ecology, Genji, Sheep fattening practices, small holder

1. Introduction

In developing countries, including Ethiopia livestock production is mostly subsistence oriented and fulfills multiple functions ^[1]. The Ethiopian livestock population is estimated at 60.39 million heads of cattle, 31.32 million sheep, 32.74 million goats, 1.42 million camels, 2.01 million horses, 0.46 million mule, 8.85 million donkeys, and 56.53 million chickens ^[2]. In Ethiopia, livestock are source of food, family income, draft power and export earnings ^[3]. Ethiopia is ranked 1st and 10th in Africa and in the world respectively in livestock population ^[4]. Unfortunately, the contribution of the Ethiopian livestock to human nutrition, family income and export earnings is disproportionately very low. There has been a decline in per capita livestock product production and consumption in the country. The per capita consumption of meat was reported to be about 8kg per year which is mainly attributed to low productivity of the livestock subsector ^[5]. There are various factors that contribute for low productivity of the livestock which include socio economic and technical limitations like inadequate feed quality and quantity, poor feeding and health management ^[6, 7]. The other contributing factors include low genetic potential, policy issues ^[8], marketing and infrastructure that affect the livestock potentials ^[9], institutional problems and problem of credit facilities and extension ^[10].

Among livestock, small ruminants particularly sheep play an important role in the economy of small scale farming communities, because of inherent risk involved in crop farming due to uncertainty of rainfall and occurrence of recurrent droughts ^[11]. The Ethiopian highland accounts for about 98 and 83% of the country's human and sheep population, respectively ^[12]. In-fact the large segment of the Ethiopian livestock are found in the highlands, characterized by mixed crop-livestock farming, high availability of crop residues and less risk of disease ^[2, 13]

Sheep have multipurpose function and contribute to the livelihood of a large number of small holder farmers [14]. In Ethiopia, Sheep production is the major source of food, cash income, saving, socio-cultural functions and manure (fertilizers) to the smallholder farmers [15].

A small number of NGOs, Donors and the Ethiopian government are involved in the implementation of small scale sheep fattening development projects in support of jobless and landless rural youth and vulnerable households. Donors and NGOs are mainly involved in training. The Ethiopian government is involved in the promotion of small scale sheep fattening (among others) in support of poverty alleviation and food security initiatives [14]. Thus, sheep fattening is found to be one of the most important strategy to create job and improve family income of the rural community. It is an effective means of job creation and poverty alleviation both in rural and urban areas, with the use of locally available feed resources and customized trainings [16, 17]. Sheep fattening requires relatively low initial start-up capital [18]. It is common practice in different parts of the country, though the degree of fattening and resource base differs markedly. Fattening is generally profitable because the value per kilogram of live weight increases as both weight and condition increase [19]. Genji District of West Wollega Zone is not exception to this situation. This being the case major objective of this research

is to assess and characterize small scale sheep fattening system practiced in Genji District of West Wollega Zone, Oromia, Ethiopia.

2. Materials and Method

2.1 Description of the Study Area and period

The study was carried out in Genji district of south west Wollega zone of Oromia regional state between the periods of December 2019 up to September 2020. It lies between 8° 57, 30” and 9° 7, 30” North latitude and 35° 30’0” and 35° 45’ 0” East longitude and 544 km from Addis Ababa. The minimum and maximum annual temperature of the District varies from 16°C to 25°C; respectively (GDLEPO, 2019). The area receives annual rainfall ranging from 1225 to 2000 millimeter. Based on the collected in 2007 E.C national census conducted by the Central Statistics Agency of Ethiopia, Genji districts had a total population of 69,450 inhabitants. The farming system of the district is characterized by crop- livestock mixed farming system. The major crops grown include coffee, maize, sorghum, teff and millet (GWAO. 2019). The total livestock populations of the District estimated were: Chickens 66,595, Cattle 52,815, Sheep 17, 935, Goat 5,744, Horses 715, Mule 820, Donkeys 8715 and Beehives 48,792 (GDLFDO, 2019-unpublished data).

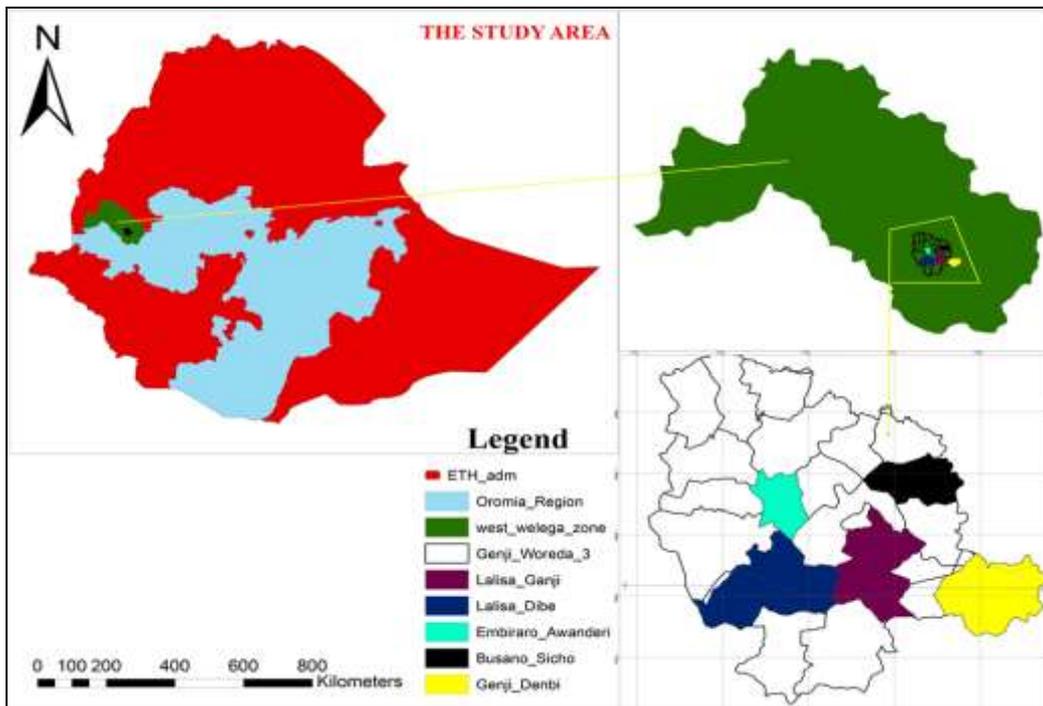


Fig 1: Map of study area

2.2 Sampling Technique

The study area was stratified into midland (altitude) (70%) and lowland (altitude) (30%) agro-ecologies, which ranges between 1420 and 2500 m.a.s.l. (GDLEPO, 2019-unpublished source). From the total 21 villages of the Districts, three and two Villages (total of five) were purposively selected from mid and low altitude respectively based on sheep production potential and accessibility. A total of 183 sheep owners (126 and 57) households (sheep producers) were randomly selected and interviewed from selected Villages of mid and low altitudes respectively. The minimum household sample size to consider for the study was determined using the following formula suggested by Thrusfield [20].

$$No = \frac{Z^2 p (1-q)}{e^2}$$

Where

n = sample size

Z= standard normal deviation (1.96) for 95% CI

P= is the estimated proportion of an attribute that is present in the population (P=0.138) q is 1-p i.e. (0.862) and e² is margin of error (0.05)

n₀= standard calculated sample population.

$$n = \frac{(1.96)^2 (0.138) (1 - 0.138)}{(0.05)^2} = \frac{3.8416 (0.138) (0.862)}{0.0025} = 183$$

2.3 Data Collection Methods

A semi-structured and pretested questionnaire prepared in local language was used to collect data on sheep fattening practices. Secondary data were obtained from reports of the District Agricultural Development Office and other published and unpublished materials which used to augment the primary data. The collected data comprised of socio-economic characteristics of the respondents and sheep fattening practices.

2.4 Statistical Data Analysis

The collected data were coded and entered in to the computer Microsoft Excel spread sheet. Descriptive statistics were employed to describe the various variables including the socio economic status (Sex, age, marital status, religious and educational status) and sheep fattening practices. SPSS Version 20 was used in the analysis. Pearson Chi-square with absolute frequency and percentage was used for ranking of different levels within the group of variables. In all cases, the 95% of significance and confidence interval with 5% level of precision were used to declare the significant difference.

3. Results and Discussion

3.1 Socio-Economic Characteristics of the Households

3.1.1 Sex, Marital and Educational Status of the Respondents

The socio-economic characteristics of the sample respondents are shown in Table 1. The majority (91.3%) of the household heads involved in sheep production and fattening practices reported to have been married. This indicates that most of the respondents of this study were adults capable of guiding their families in activities essential to the mixed livestock and crop production system. This result is in agreement with that of [11], who reported that 90.2% of households involved in sheep production and fattening activities across sub-sahara African countries were married. About 59% of the participating household members were males while 41% were females. The female household heads are either divorced or widowed. The results indicate that males are entitled to control most of the household's productive assets according to the societal customs and norms in the study area. The results of the current study was in agreement with that of [15], who reported that the large proportion of male farmers is very crucial for transferring and adoption of technologies since men are mostly the decision makers in most African societies. On the contrary, 15.6% of female household heads was reported to have directly involved in sheep fattening activities in Harshin district of Somali Regional State [19].

About 49.2% of the households respondents involved in sheep production activities across all the surveyed agro-ecological areas reported to have attended basic education. About 31.1, 9.3 and 6.7% of the respondents completed primary, preparatory and secondary education, respectively. About 2.7% of the respondents were illiterate while 1% was reported to be either diploma or BSc holders (Table 1). The results

generally indicated that significant number of the sample respondents involved in sheep production activities have basic educational background and able to read and write, which helps them to follow some instructions required to adopt agricultural technologies useful in the development of agricultural production and productivity. It is accepted that the education background of the households tend to have associated with agricultural productivity since educated farmers are better able to decode new production technology. Unlike the current result, [1] reported that the majority (67.4%) of the household heads in Metema were illiterate. Higher proportion of illiterate population is obviously could have negative impact on adoption and transfer of improved technologies to the communities. In contrary to the current study, [10] reported that 27.33% of the respondents neither write nor read in Chench and Mirab Abaya Districts of Southern Ethiopia, indicating the imbalanced distribution of adult education across the country.

3.1.2 Age and Religion of the Respondents

As depicted in Table 1, the majority (66.6%) of the sample respondents in the study areas reported to belong to the age group of 31-45 years for whom sheep fattening activities were considered as job opportunity in study area. Sheep fattening is an effective means of job creation and poverty alleviation both in rural and urban areas, with the use of locally available feed resources and customized trainings [16].

About 16.9% of the respondents were >60 years old who were also involved in sheep fattening activities. In agreement with the reports of Population communication (2014), the results of this study indicated that majority of the sample households belong to the active working age group of 15 to 64 years. Moreover, for older people, sheep keeping provide a coping strategy for retirement. In line with the results of the present study, [21] noted that the overall average age of the respondent household heads was 50 ±10.44 years, implying that the respondents were adults with a good experience in sheep farming. According to the results of the current study, about 10.4 and 6% of the households belong to the mean age group of 46-60 and 20-30 years respectively. The household heads in the age group of 41-60 years of age, do not want to go far from their family. Rather, they might prefer to look after and support their family with the available resources. In line with this study, [8], reported that 33.3 and 30% of the household respondents of Hawassa belong to the age group of 41-50 and 51-60 years, respectively. About 87.7, 10.8 and 1.5% of the sample households in the current study were protestant Christians, Muslims and Orthodox Christians respectively, which do not affect sheep fattening activities. On the contrary [9] indicated that the majority of the respondents in Tigray were Orthodox Christians, and religion influences livestock consumption and marketing through festivities and fasting periods. This variation could be because of religious preference of societies.

Table 1: Socio-economic Characteristics of the Respondents (N=183)

Parameters	Categories	Lowland (n=57)				Midland (n=126)						Total (%)
		L/Dibe		B/ Sicho		L/Genji		G/Dembi		I/wandari		
		n	%	n	%	n	%	n	%	n	%	
Sex	Male	14	24.5	18	31.5	27	21.4	23	18.2	26	20.6	59.0
	Female	16	28.3	9	15.7	14	11.1	19	15.0	17	13.4	41.0
Age	20-30	3	5.2	1	1.7	2	1.5	1	0.7	4	3.1	6.0
	31-45	18	31.5	18	31.5	30	23.8	29	23.7	27	21.4	66.7
	46-60	5	8.7	1	1.7	6	4.7	1	0.7	6	4.7	10.4
	>60	4	7.0	7	12.2	3	2.3	11	8.7	6	4.7	16.9
Educational status	Basic edu.	13	22.8	12	21.5	23	18.9	20	15.8	22	17.4	49.2

	Primary	11	19.2	12	21.5	11	8.7	13	10.3	8	6.3	31.1
	Preparatory	3	5.2	1	1.7	3	2.3	5	3.9	5	3.9	9.3
	Secondary	2	3.5	1	1.7	3	2.3	3	2.3	4	3.1	6.7
	Illiterate	0	0.0	1	1.7	0	0.0	1	0.7	4	3.1	2.7
	Diploma	1	1.7	0	0.0	0	0.0	0	0.0	0	0.0	0.5
	B.A Degree	0	0.0	0	0.0	1	0.7	0	0.0	0	0.0	0.5
Marital status	Married	22	38.5	25	43.8	38	30.1	40	31.7	39	30.9	91.3
	Unmarried	8	14.3	2	3.5	3	2.3	2	2.3	4	3.1	8.7
Religion	Protestant	26	45.6	24	13.1	36	19.7	37	29.3	37	29.3	87.7
	Muslim	3	5.2	3	1.6	4	2.2	5	3.9	5	3.9	10.8
	Orthodox	1	1.7	0	0.0	1	0.7	0	0.0	1	0.7	1.5

*Illiterate = unable to read and write, N= frequency of respondents

3.2 Livestock Holding

Livestock production is an integral part of the livelihood of smallholders' farmers in the study district. Mean household holding for cattle, sheep, goats, poultry, mules and donkeys was 8.81 ± 0.23 , 7.13 ± 0.78 , 4.33 ± 0.23 , 0.49 ± 0.17 , 0.71 ± 0.19 and 6.67 ± 0.24 , respectively. The sheep exists as a social group, known as a flock of sheep. Average flock structure of sheep per household flock structures of sheep comprises of 1.97 ± 0.11 , 2.80 ± 0.13 , 1.06 ± 0.17 and 1.32 ± 0.07 ewe (hoolaa haadhoo), ram (korbeessa), ram ewe (young female) and ram lamb (young male sheep) respectively. Average land holding per household in the study area was

2.24 ± 0.07 ha (2.31 ± 0.06 and 2.17 ± 0.08 for the midland and lowland, respectively). There was no significant difference between the studied agro-ecologies ($P > 0.05$) in mean landholding. There was significant difference ($p < 0.05$) between the mid and lowlands in mean cattle and sheep holdings. Household in the lowlands own high number of livestock than those in the midland agro-ecology. The higher proportion of ram (2.80 ± 0.13) across both mid and lowland agro-ecology clearly indicate the importance of sheep fattening i as means of household income and livelihood (Table 2).

Table 2: Land (ha), livestock holding and sheep flock structure of the respondents

		Agro ecology			
		Midland (N=126)	Lowland (N=57)	Overall M±SE	P-value
Description		M±SE	M±SE		
Land per Household		2.31 ± 0.06	2.17 ± 0.08	2.24 ± 0.07	Ns
Livestock's	Cattle	8.7 ± 0.28	9.08 ± 0.41	8.81 ± 0.23	0.02
	Sheep	6.94 ± 0.39	7.33 ± 0.59	7.13 ± 0.78	0.04
	Goat	4.14 ± 0.27	4.76 ± 0.41	4.33 ± 0.23	Ns
	Horse	0.56 ± 0.23	0.42 ± 0.12	0.49 ± 0.17	Ns
	Mule	0.47 ± 0.18	0.12 ± 0.44	0.71 ± 0.19	Ns
	Donkey	2.46 ± 0.13	2.50 ± 0.16	6.67 ± 0.24	Ns
Flock structure	Ram	2.76 ± 0.13	2.84 ± 0.14	2.80 ± 0.13	Ns
	Ewe	1.59 ± 0.10	2.35 ± 0.13	1.97 ± 0.11	Ns
	Ram lamb	1.19 ± 0.04	1.46 ± 0.10	1.32 ± 0.07	Ns
	Ram ewe	1.40 ± 0.12	0.72 ± 0.22	1.06 ± 0.17	Ns

N= Numbers of respondents, HH: Household, SE: Standard error means, Ns= non-significant, M=mean

3.3 Sheep Fattening Practice in Genji District

3.3.1 Fattening practices and breeds of sheep used for fattening

The overall practices of sheep fattening in the study were presented in Table 3. The results showed that about 45.4% of the sample respondents practice sheep fattening in the study area. This result agrees with that of [8], who reported that in Fogera district about 44.3% of the households practiced sheep fattening. However, the current result is lower than that of [22] who reported that about 37.1% of respondents in urban and peri-urban areas of Debre-Berhan and Dessie areas practiced sheep fattening activities.

About 44.2 and 47.9% of the sample households reported to have been involved in sheep fattening in the midland and lowland agro ecologies, respectively. About 18.2% of the midland household respondents involved in sheep fattening are resident of Imbiraro Awandari Villages, whereas; about 28.7% of the household respondents of the lowlands involved in sheep fattening are resident of Lelisa dibe. The reason for high sheep fattening practices in midland (Imbiraro Awandari) and lowland (Lelisa dibe) was the presence of Non-Governmental Organization (NGO) called Green land, which encourage and mobilize sheep production activities

particularly fattening of home born lambs. The reasons for low proportion of the household respondents involved in sheep fattening practices in Midland (Genji dembi 12.6) and lowland (Busano Sicho 19.2%) was attributed to lack of awareness in sheep fattening activities. The results of the current study was in agreement with that of [7], who indicated that small number of NGOs, Donor and the Ethiopian government are involved in the implementation of small scale poultry production and sheep fattening development projects in support of jobless and landless rural youth and vulnerable households. Local Horro breed of sheep was reported to be the breed of preference for fattening purpose. This is due to the fact that Horro breed is the most dominant and widely available sheep in the western part of the country. Among the indigenous sheep breeds, Horro sheep breed are reported to be large sized and superior to the other indigenous breeds of sheep in live body weight [23]. Horro sheep is a fat-tailed hair-type sheep with better growth potential compared with other indigenous breeds in Ethiopia [17]. In contrast to the results of the current study, [5] reported that farmers participating in rearing Washera, Farta and their crossbred have better preferences for Washera and Farta breeds.

3.3.2 Purposes of sheep fattening

The results showed that about 82.1% of the sample households in the midland agro ecology and 66.6% households in lowland agro-ecology started sheep fattening for the purpose of generating family incomes (Table 3). These results were in agreement with that of [24, 12], who reported the same reason for starting sheep fattening in Ilu aba bora zone. The result also agrees with that of [1, 24], who reported that sheep fattening is initiated for the purpose of income generation in different parts of Ethiopia. About 10.7% and 18.5% of the households in the midland and lowland areas of the current study area reported to have started sheep fattening for saving purpose, respectively. The results of the current study was also in agreement to that of [21], who reported that keeping livestock, especially sheep play a role as safety net that enables households to get quick income to settle urgent financial needs. As shown in Table 4, about 7.2 and 14.9% households in midland and lowlands respectively reported to have started sheep fattening for the purpose of creating job opportunity. These results were in agreement with that of [14] who indicated that sheep fattening is found to be one of the most important strategies to create job and improve the family income of the rural community. Fattening is generally profitable because the value per kilogram of live weight increases as both weight and condition increase [19]

3.3.3 Sources and type of sheep used for fattening

According to 75.9% of the responding households, the common source of sheep for fattening in the study area is home born rams. This shows the presence of sheep production potential in the study area especially in the midland. The sample households in the lowland areas also reported to keep home grown sheep for fattening purpose rather than buying

from market. In agreement to the present finding, [25] in south western Ethiopia and [21] in Western Tigray reported that home born sheep are the major source of fattening. However, fatteners who do not participate in the sheep production, buy sheep from market when interested in starting fattening. Similar to the results of the current study, it was suggested that market is an important source of the flock in starting sheep fattening foundation stock [1]. About 3.7% of the household of lowland study area reported to have started fattening with the use of gift respectively. This result is in agreement with that of [26], who indicated that gifts from different sources and inheritances from family were reported as important ways of building sheep flock for fattening.

About 86.7% of the household respondents reported to have used uncastrated ram for fattening. About 9.6, 2.4 and 1.2% of the household respondents reported to have used unproductive, castrated ram and old female for fattening based on their customer preferences. In agreement with the results of the current study, [1, 16] indicated that younger animals at finishing may have tender carcasses and greater market demand than fattened older animals. About 55.4, 24.1, 7.2 and 6% of the household respondents reported to have preference for fattening at an age of 1.5, 2.0, 3.0 and 2.5 years, respectively. In finishing fattened animals, the common experience of the fatteners was to fulfill the demand of the consumer. But the farmers have no knowledge and practice of measuring the actual weight of the fattened sheep and only depend on guessing or estimation. [5], reported that similar age in which sheep preferred for fattening in Fogera district. In accordance with [27] indicated that an exaggerated age above 36 months could be regarded as fatigue meat by consumer in different agro ecological zones of Amhara region.

Table 3: Practices, purposes and types of sheep used for fattening

Parameters	Categories	Lowland=57						Midland=126						Total (%)		
		L/D		B/ Sicho		Total of lowland		L/Genji		G/Dembi		I/A			Total of midland	
		N	%	N	%	N	%	N	%	N	%	N	%		N	%
Practice sheep fattening	Yes	16	28.7	11	19.2	27	47.9	17	13.4	16	12.6	23	18.2	56	44.2	45.4
	No	14	24.5	16	28.7	30	52.1	24	19.4	26	20.6	20	15.8	70	55.8	54.6
Purpose of sheep fattening	Income source	10	37.3	8	29.6	18	66.6	15	26.7	12	21.4	19	33.9	46	82.1	77.1
	Saving	2	7.4	3	11.1	5	18.5	1	1.7	3	5.3	2	3.5	6	10.7	13.3
	Job creation	4	14.8	0	0.0	4	14.9	1	1.7	1	1.7	2	3.5	4	7.2	9.6
Sources of Fattening sheep	Home born	14	51.8	5	18.5	19	70.4	13	23.2	12	21.4	19	33.9	44	78.5	75.9
	Purchased	1	3.7	4	15.3	5	18.5	2	3.5	3	5.3	4	7.1	9	16.7	16.9
	Loan	1	3.7	1	3.7	2	7.4	2	3.5	1	1.7	0	0.0	3	5.3	6.0
	Gift	0	0.0	1	3.7	1	3.7	0	0.0	0	0.0	0	0.0	0	0.0	1.2
Preferred animal category for fattening	Castrated ram	1	3.7	0	0.0	1	3.7	1	1.7	0	0.0	0	0.0	1	1.8	2.4
	Uncastrated ram	14	51.8	10	37.3	24	88.9	13	23.2	14	25.0	21	37.5	48	85.7	86.7
	Old ewe	0	0.0	0	0.0	0	0.0	0	0.0	1	1.7	0	0.0	1	1.8	1.2
	Unproductive	1	3.7	1	3.7	2	7.4	3	5.3	1	1.7	2	3.6	6	10.7	9.6
Average age of fattened sheep	1 yr	0	0.0	1	3.7	1	3.7	2	3.5	2	3.6	1	1.7	5	8.9	7.2
	1.5yrs	8	29.6	5	18.5	13	48.2	9	16.7	9	16.7	15	28.8	33	58.9	55.4
	2 yrs	4	14.8	4	14.8	8	29.6	4	7.1	4	7.1	4	7.1	12	21.4	24.1
	2.5 yrs	2	7.4	0	0.0	2	7.4	1	1.7	1	1.7	1	1.7	3	5.4	6.0
	3 yrs	2	7.4	1	3.7	3	11.1	1	1.7	0	0.0	2	3.6	3	5.4	7.2

L/D=Lelisa Dibe, B/S=Busano Sicho, L/G=Lelisa Genji, G/D=Genji Dembi, I/A=Imbiraro Awandari N=frequency of respondents

3.3.4 Selection criteria of sheep for fattening

Farmers' selection criteria for purchasing sheep for fattening in study area include health, age, purchase price, body size/frame, body condition and color (Table 4). Fatteners also use visual appraisal for selection of fattening sheep. They also consider body condition, skeletal frame, castration, breed, sex, weight and age of the animals for fattening [19]. Health

condition was reported to be the first ranked selection criteria for fattening sheep in both mid and lowland agro ecologies of study area. Age was the second ranked selection criteria in mid and lowland areas. There is no practice of fattening castrated ram. Younger animals at finishing may have tender carcasses and greater market demand than fattened older animals. This needs to be determined through studies on

consumer and market preferences in the Ethiopian context ^[1]. In contrast to results of the current study, in the urban areas of Debre-Berhan, the majority of the household respondents practice fattening of castrated sheep. In Dessie peri-urban areas, several household respondents fattened both castrated and intact sheep ^[22]. Body size, body condition, color and purchase price (in order of importance) are important

selection criteria used in the midland areas. Body condition, Body size, purchase price and color ranked third, fourth, fifth and sixth in the lowlands. The results of the group discussions showed that pure black and pure white colors have less demand in the market across all the study sites. ^[27] reported similar criteria used for selecting sheep for fattening purpose in different agro ecologies of the Amhara region.

Table 4: Farmers selection criteria in purchasing sheep for fattening in Genji district

Selection criteria	Agro ecology					
	Midland			Lowland		
	Sum	Index	Rank	Sum	Index	Rank
Age	246	0.203	2	108	0.202	2
Body size	245	0.202	3	102	0.191	4
Health	277	0.229	1	137	0.256	1
Body condition	182	0.150	4	104	0.194	3
Marketing price	94	0.078	6	34	0.064	5
Color	167	0.138	5	48	0.090	6

Table 5: Size of sheep subjected for fattening per cycle and floor used for bedding in the study area

Management practices of fattening sheep	Categories	Lowland=27				Midland=56				Total %	X ²	P-value		
		L/Dibe		B/Sicho		L/Genji		G/Dembi					I/wandari	
		N	%	N	%	N	%	N	%				N	%
Number of sheep fattened/ cycle	2-3	12	44.5	5	18.5	8	14.3	11	19.6	5	8.9	49.4	21.822	Ns
	4-6	3	11.1	5	18.5	4	4.8	3	5.3	16	28.6			
	>6	1	3.7	1	3.7	5	6.0	2	3.6	2	3.6			
Total		16	59.3	11	40.7	17	30.4	16	28.5	23	41.1	100		
Type of floor used for bedding	Well-arranged stone	1	3.7	1	3.7	1	1.8	2	3.8	1	1.8	7.2	8.850	Ns
	Wooden	10	37.0	10	37.0	11	19.6	13	23.2	19	33.9	75.9		
	Earthen	5	18.5	0	0.0	5	8.9	1	1.8	3	5.3	16.9		
Total		16	59.2	11	40.7	17	30.4	16	28.6	23	41.0	100		

L/D= Lelisa Dibe, B/ S= Busano Sicho, L/G= Lelisa Genji, G/D= Genji Dembi, I/A = Imbiraro Awandari, N= frequency of respondents, x²= chi-square. Ns= non-significant

3.3.5 Number of sheep fattened per fattening cycle in Genji district

From the total sheep fatteners, 49.4% of the respondents reported to fatten 2-3 sheep per one cycle, whereas 37.3% 4-6 sheep per one cycle, and 13.3% reported to fatten >6 sheep per one cycle in study area. According to ^[8], farmers on average fatten 3 sheep per fattening period in Fogera district. Due to major livestock production constraints like in adequate feed supply, lack of capital, land, disease, poor market infrastructure, lack of marketing support services and limited market information and etc., sheep fatteners in the study area could not participate in sheep fattening practice to their full potential ^[24]. There was no significant difference (P>0.05) in number of Fattened sheep across low and midland agro ecologies (Table 5)

3.3.6 Types of housing for fattening sheep

The types of housing system used for fattening sheep in study area presented in Figure 1. According to the sample households in both agro-ecologies, the most frequently used

housing system in the study area was a type of house constructed attached to the family dwelling. This finding is similar with that of ^[21, 6, 28], who reported, farmers in urban areas of Ethiopia, use houses separated or attached to the family dwellings in accommodating fattening sheep. Some of interviewed households in the midland and lowland areas reported to house their sheep within the family dwelling together with human being and some construct separate house for their fattening sheep. However, respondents of the study area did not practice open yard housing without shade. ^[5] noted that good housing can determine productivity of fattening sheep by reducing stress, disease hazards and easing the management.

The most commonly used type of floor for bedding material shown in Table 5 was wooden (75.9%) followed by earthen (without bedding material) (16.9%) and well-arranged stone for bedding (7.2%). In accordance with the finding of [29] who reported the dominant floor type of sheep during the dry and rainy seasons was both earthen and wooden type in Bure district.

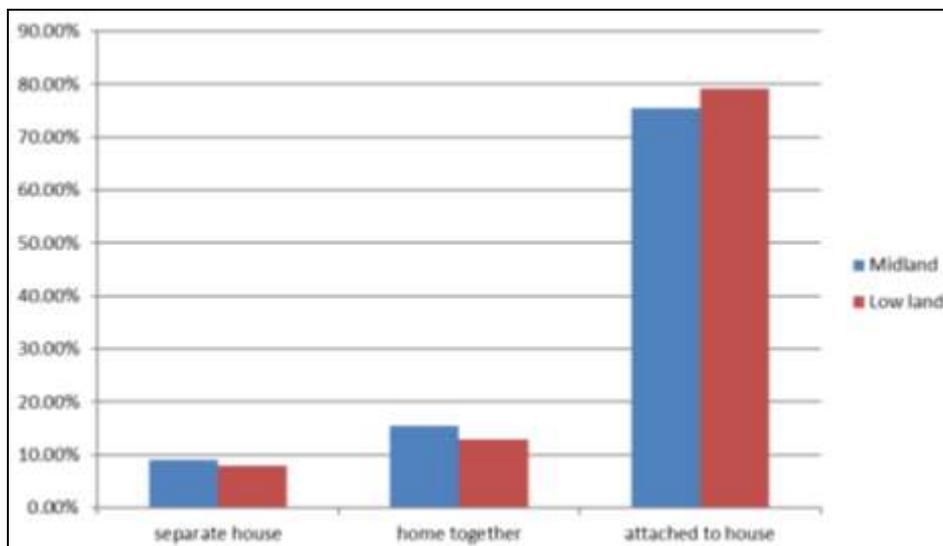


Fig 2: Types of housing system used for fattening sheep in study area

4. Conclusion and Recommendations

Sheep fattening is important farming activities in the current study area (Genji). The district is known to have good population of sheep with the average flock number being 7 sheep per house hold. Significantly high number of sheep per household was identified in the mid agro-ecology than low land agro-ecology. In the current study it was identified that not all sheep owners are engaged in fattening sheep. Out of the 183 house hold that had sheep, only 45.4% were found to practice sheep fattening suggesting that the rest of the farmers may sell their sheep without fattening at any age or body condition. A range of management practices of sheep fattening by the small holder of the current study area were identified with some of them having scientific back ground. Extensive system, characterized by utilization of Horro sheep breeds on free grazing and seldom supplemented with the locally available feed types was the sole method of sheep fattening in the study area. Even if, this study area is known by sheep fattening practice, several management conditions such as housing and sources of water impede production and productivity not to gain as much as expected. Hence, such problems resolution may be very crucial in order to increase the productivity so as improve the livelihood of the small holder farmers of the study area. Therefore, based on the above conclusion, the following recommendations are forwarded:

- Sheep fatteners should be trained on some of their suboptimal management systems of the sheep.
- Since the number of sheep fattened is by far lower than sheep produced in the study area, government and other concerned bodies should provide training and awareness creation symposium to initiate sheep fattening practices for better productivity.

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