

# Farmers' perception towards Awassi Menz crossbred sheep and management practice in North Shoa

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## ABSTRACT

The study was carried out in Basonawerena and Angolelatera districts in north shoa zone of Amhara region, Ethiopia. The objectives of the study were to assess the perception of the farmers on the distributed crossbreds and the management practice under take in the area. A total of 150 households were selected purposively to assess perception of farmers. Data were gathered through semi-structured questionnaire. The results showed that the major feed resources during dry and wet seasons were natural pasture and crop residue. The majority of the farmers in both districts (94.44% in Basonaworena and 93.33% in Angolelatera) provide special management for the crossbred lambs. The major diseases in both districts are Fasciola (liver fluke), pasteurolosis and sheep pox in order of importance. Farmers comparative ranking of crossbreds and local sheep showed that crossbred rams were better in growth, wool production, and appearance but have higher feed requirements, whereas locals were better in meat quality (taste) and resistance to disease in both districts.

**Keywords:** Perception, Crossbreeding and management practice

## 1. INTRODUCTION

The population of sheep in Ethiopia is estimated at 24.2 million, out of which about 73.2 percent are females, and about 26.8 percent are males (CSA, 2012). In spite of the large population of sheep and the great role of sheep both to the lively hood of resource-poor farmers and the national economy at large; the current level of on farm productivity in the smallholder production system is low. Their productivity is limited due to various factors involving biological and environmental aspects as well as socio economic factors (Kasha, 2009).

All most all sheep under production in the study area are indigenous breeds, though few on-station trials and on farm extension activities which involve crossing the coarse-wool Menz sheep with a number of exotic breeds (mainly Awassi breed) have been made (Yimam *et al.*, 2002). The indigenous breeds are well adapted to the existing environmental conditions and can be used in pure or in crossing systems with improved breeds (Olivier *et al.*, 2002).

Crossbreeding is one of the genetic improvement tools used to improve productivity of sheep. Crossbreeding of indigenous livestock breeds with improved exotic or local breeds is usually quick means of genetic improvement. Importation and multiplication of exotic breeds in nucleus centers has largely been a successful activity in Ethiopia. However, disseminating improved breeds to village and designing, organizing and implementing crossbreeding activities at the village level has been a challenge (Solomon *et al.*, 2008).

Past efforts initiated by governmental and non-governmental organizations for sheep improvements were limited to crossbreeding of indigenous sheep with exotic breeds for distribution of crossbred rams to the farmers. This approach was rarely successful due to incompatibility of the genotypes with the farmers' breeding objectives and the production systems (Markos, 2006). Little attempts were made to develop strategies for genetic improvement of the indigenous sheep breeds at the national level.

A Menz sheep genetic improvement project was initiated in 1967. The breeding strategy adopted was crossbreeding of the Menz sheep with exotic wool sheep breeds. The breeding goal was to improve the mutton and wool production of Menz sheep. In 1980, the Awassi sheep breed, which has a similar phenotypic appearance to the local sheep, was introduced from Israel and has been well accepted by producers. The Awassi crossbreeding project operates at the Debre Birhan and Amed Guya Sheep Breeding and Multiplication Center. The crossbreeding scheme involves importation of pure Awassi rams, production of crossbred (Awassi x Menz) rams in the breeding and multiplication center, distribution of six month old rams to villagers and upgrading of the village flocks to  $\frac{3}{4}$  Awassi. Lately, importation and maintenance of a small flock of pure Awassi rams and ewes to multiply the pure stock has been tried. Exotic diseases like meadia-visna and biosecurity are other challenges associated with the importation of exotic germplasm that should be considered (Solomon and Tesfaye, 2008). The study investigates both the management practice and farmers perception towards cross breeding

## 2. MATERIAL AND METHODS

### 2.1. Description of the Study Area

The study was conducted in three districts i.e., Basonawerena and Angolelatera to assess the perception of the farmers about the distributed crossbred rams and Amed Guya sheep Breeding and Multiplication Center which located in Menz Gera districts to evaluate crosses and Menz sheep. In North Shoa Zone of Amhara Region.

#### 2.1.1. Basonawerena district.

Basoawerena district is located at  $09^{\circ}41'N$  longitude and  $39^{\circ}31'E$  latitude. It is about 135 km North of Addis Ababa. It covers about 121,300 hectare with mean elevation 2800-2845 m.a.s.l. The mean annual temperature is  $13.6^{\circ}C$  and annual rainfall range between 1000mm to 1200mm, with two rainy seasons, namely Meher (July to September), which denotes the big rain season while Belg denotes the small rain season from February to May (Basonawerena District Agricultural Office, 2012).

The economic bases of the community in the district is rain fed farming practices and free range livestock rearing. Mixed agriculture remains to be the main livelihood activity. The major cultivated crops include teff, barely, wheat, lentils, field peas, sorghum and beans. In general, activities other than agriculture seem to be very limited. The area is rich in livestock; shortage of feed is limiting its development. Grazing and crop residues, which are the major sources of animal feed, are under critical shortage (Basonawerena District Agricultural Office, 2012).

Livestock is an important household resource that plays significant role to household food security, income generation, food supply (milk and meat), transportation, draught power/ploughing, and for supply of manure and fuel. Cattle, sheep, goat, pack animals and poultry are the most common domestic animals raised in the rural district (Basonawerena District Agricultural Office, 2012).

#### 2.1.2. Angolelatera district

Angolelatera district is located at  $9^{\circ}38'N$  longitude and  $39^{\circ}26'E$  latitude. It is about 110 km North of Addis Ababa. The district covers an area of 989,000 hectare and elevation of the district ranges from 1700 to 3044 m.a.s.l. The mean annual temperature is  $10^{\circ}C$  and the annual rain fall ranges from 930-1100mm. The district has two rainy seasons namely Meher (July to September), which denotes the big rainy season while Belg denotes the small rainy season from March to April and also irrigation is one of the activity held in September and May (Angolelatera District Agricultural Office, 2012).

The area is characterized by mixed farming system where livestock is very important. Barley, wheat, teff, sorghum and bean are the most common crops. Sheep, cattle and equines are the main livestock kept in the area (Angolelatera District Agricultural Office, 2012).

### 2.2. Sampling techniques

Information was gathered from Debre Berhan Sheep Breeding and Multiplication Center about distributed crossbred rams in to the districts. Prior to household selection development agents and PA leaders were requested to prepare a list of households currently rearing crossbred sheep. Based on the information three districts in North Shoa zone had crossbred rams. Purposive sampling technique was employed to select the two districts (Basonawerena and Angolelatera) based on potential for crossbred sheep and accessibility to road. Five peasant associations (PAs) from both districts were selected for this study.

A total of 150 households 90 from Basonawerena and 60 from Angolelatera were purposively selected. In each PAs 30 respondents were selected for interview. From 150 households 62 were owner of 1/2 Awassi 1/2 Menz (21 from Basowerena and 41 from Angolelatera) and 42 of 3/4 Awassi 1/4 Menz crossbred rams (33 from Basonawerena and 9 from Angolelatera). The rest 46 respondents do not have crossbred rams but they got mating service from their neighbors and in grazing area.

### 2.3. Methods of data collection

Data were generated by administrating a with semi-structured questionnaire, and from secondary sources. Secondary data on climate conditions, topography, agro-ecology and crossbred sheep population, sheep production constraints were collected from agricultural rural development office.

### 2.4. Data Analysis

The survey data were described in percentages and indices. Indices were calculated to provide overall ranking for the disease prevalence, feed resources, perception of farmers for different traits and class of sheep sold during cash need according to the formula:

Index = sum of (3 x rank 1 + 2 x rank 2 + 1 x rank 3) given for an individual reason (attribute) divided by the

sum of (3 x sum of rank 1 + 2 x sum of rank 2 + 1 x sum of rank 3) for overall reasons. For the variable that express in terms of frequency percentage were analyzed by SPPSS 20.

### 3. RESULTS AND DISCUSSION

#### 3.1. Feed resources

Feed resources commonly used by farmers in the study area across the different seasons are presented in Table 1 and 8. The quantity and quality of feed resources available for animals primarily depends upon the climatic and seasonal factors (Zewdu, 2008). In this study, natural pasture was the major feed resource with mean indexes of 0.56 and 0.49 for Basonawerena and Angolelatera respectively during the rainy season though it is limited because of crop production. Crop residue and natural pasture are used as a source of animal feed in the dry season in both districts. The importance of natural pasture as major feed resource for sheep was also reported by Dejen (2010) in Keffa and Bench-Maji, Amelmal (2011) in Dawro zone and Konta special woreda and Tassew (2012) in north Wollo zone.

Table 1. Major feed resources during wet seasons in the study areas

Feed resources in wet season	District							
	Basonawerena				Angolelatera			
	R1	R2	R3	Index	R1	R2	R3	Index
Natural pasture	61	47	25	0.56	38	25	15	0.49
Crop residue	14	23	41	0.24	12	21	8	0.24
Fallow land	10	14	13	0.13	6	7	26	0.16
Hay	2	4	6	0.04	3	4	7	0.07
Concentrate	3	2	5	0.03	1	3	4	0.04

Table 2. Major feed resources in dry season in the study areas

Feed resources in dry season	District							
	Basonawerena				Angolelatera			
	R1	R2	R3	Index	R1	R2	R3	Index
Natural pasture	16	18	36	0.22	13	11	22	0.23
Crop residue	48	37	7	0.42	35	23	8	0.44
Fallow land	10	13	19	0.14	9	9	12	0.16
Hay	15	18	23	0.19	1	10	15	0.11
Concentrate	1	4	5	0.03	2	7	3	0.06

Most of the farmers in both district reported that they faced serious feed shortage. The land available for natural grazing is rapidly decreasing due to the increasing human population and the demand for cropland. The crossbred sheep is more affected than the local in shortage of feed.

#### 3.2. Water resources and watering

The major sources of water in wet and dry season in the study area are river, spring, pond, rain water and pipe water. About 82.22% and 80% of the respondents in Basonawerena and Angolelatera, respectively use river as source of water in dry season water. Bosenu (2012) also reported that river was the major water source in Selale area. Spring water as reported by 11.11% and 16.67% of the respondents in Basonawerena and Angolelatera, respectively those used pipe water for their sheep were 6.67% and 3.33% in Basonawerena and Angolelatera respectively as indicated below in Table (3). During wet season, pond to be the major sources of water followed by rain water. However, rain water was common in the wet season of the year.

Table 3. Percentage of the source of water found in dry and wet seasons in the study areas

Source of water	Basonawerena				Angolelatera			
	Dry Season		Wet Season		Dry Season		Wet Season	
	N	%	N	%	N	%	N	%
River	74	82.22	-	-	48	80	-	-
Spring	10	11.11	-	-	10	16.67	-	-
Pipe water	6	6.67	-	-	2	3.33	-	-
Pond	-	-	75	83.33	-	-	-	-
Rain water	-	-	15	16.67	-	-	100	100

N=number; %=percentage of respondent

In wet season, all of the farmers in both district allowed their flock to drink freely available water. Bosenu (2012) also reported that farmers allow their flock to drink freely in wet season in Selale area. However, during dry period, 97.78% and 83.33% of the respondents in Basonawerena and Angolelatera provided water once a day.

### 3.3. Disease

Freedom from major disease is regarded globally as pre requisite for genetic improvements (Solomon 2007). Farmers in Basonawerena and Angolelatera identified the major sheep diseases as indicated in Table 4. Fasciola (Liver fluke), pasteuriosis and sheep pox were the major reported sheep disease in that order in Basonawerena. Similarly in Angolelatera, liver fluke, sheep pox and pastoralists as the major diseases affecting sheep productivity in that order. According to Tesfaye (2008) and Bosenu (2012) liver fluke is the major disease in Selale and Menz areas respectively. Crossbred sheep are less resistant than the local hence special emphasis should be given beside the local sheep.

Table 4. Prevalence of disease and its symptoms in the study area

Type of disease	District							
	Basonawerena				Angolelatera			
	R1	R2	R3	Index	R1	R2	R3	Index
Fasiola (liver fluke)	47	13	10	0.33	20	21	14	0.30
Pasteurolosis	15	47	14	0.28	4	21	8	0.20
Sheep pox	18	22	46	0.27	23	8	7	0.26
Foot root	2	2	8	0.03	2	3	18	0.08
External parasite	2	1	0	0.02	3	1	1	0.03
FMD	3	5	8	0.05	4	4	10	0.08
Coenurosis	3	-	4	0.02	4	2	2	0.05

Most of the farmers use modern drugs from government clinics and open markets. Farmers tried to treat most diseased animals using common albendazole which is a broad anthelmintic. Vaccination also given by the government when disease occurred.

The disease prevalence in the study area may have an impact in crossbred rams since they are less resistant to disease compared to locals. There is feed shortage in the area and crossbred rams require more feed than the locals.

### 3.4. Housing

Adequate housing protects animals from extreme temperature, rain, cold, wind, predator and theft. This is an agreement with report of Belete et al (2010) and shigdaf et al (2012) It further provides opportunities for intensive feeding and controlled breeding. In the study area, sheep are housed in different ways. The majority of the respondent in Basonawerena (46.67%) and Angolelatera (43.33%) house their sheep in *Guada* (attached to the main house). Family house were also reported by some farmers across the two districts. The farmers across the study districts house their sheep during the night.

### 3.5. Castration and fattening

Majority of sheep owner in Basonawerena (76.67%) and Angolelatera (83.6%) practice castration. About 93.33% and 66.67% of the sheep owners in Basonawerena and Angolelatera, respectively, use traditional castration method to castrate their sheep. Reasons of castration for Basonawerena farmers were to improve fattening (72.22%), to avoid unnecessary mating (20%) and to improve behavior of the ram (temperament) (7.78%). For Angolelatera sheep owners, the reasons were to improve fattening (66.67%), avoid unnecessary mating (25%), and to improve ram behavior (temperament) (8.33%).

The common season for fattening sheep in the area was around the end of the rainy season i.e. the onset of dry season. It was reported that this is suitable since there is better availability of feed resources, to adjust for most festivals (Christmas, the Ethiopian Easter, and New Year), though their exact date of celebrations are fixed. Frequent fattening practice following the main rainy season due to better forage production, warmer temperature and target for specific market was reported in Horro area (Zewdu, 2008).

Those give supplementary feed for castrated were 86.67% and 83.33% in Basonawerena and Angolelatera, respectively. The type of supplemented feed were Crop residues, salt, grain, home left over, non-conventional local brewery by products such as *atella* of *areke* and *tella*, noug seed cake (*fagullo*) and wheat bran (*frushica*). This result is in agreement with Bosenu et al (2014).

Table 2. Reasons for castration of sheep in study area

N= Number; %=Percentage of the respondent

Reason of castration	Districts			
	Basonawerena		Angolelatera	
	N	%	N	%
Control breeding	18	20	15	25
Improve fattening	65	72.22	40	66.67
Better temperament	7	7.78	5	8.33

The choice of farmers to castrate their rams were 47.8%, 14.44%, 4.43% and 33.33% of local, 3/4 Awassi 1/4 Menz, 1/2 Awassi 1/2 Menz and all type respectively in Basonawerena whereas for Angolelatera 88.33%, 6.67% and 5% of local, 3/4 Awassi 1/4 Menz and 1/2 Awassi 1/2 Menz respectively. The reason for selection of the local ram as first for castration dependent on the need of the farmer keep 3/4 Awassi 1/4 Menz and 1/2 Awassi 1/2 Menz for breeding purpose.

### 3.6. Marketing of sheep

Though farmers across the study sites sell their animals when financial problems force them to sell, they do prefer to sell their sheep during holidays and festivals. It was reported that better price is fetched during holidays such as Ethiopian New Year, Christmas and Easter. Sheep are primarily sold in the nearby market on individual basis and agreement on prices reached after a long one-to-one bargaining between buyers and sellers and sometimes brokers.

### 3.7. Crossbreeding practices

All of the interviewed farmers in Basonawerena and Angolelatera were interested to use crossbred ram. Farmers were interested in the fast growth of crossbred sheep, their good appearance, large body size, colour and large tail. Even though farmers prefer the crossbred sheep than the indigenous Menz sheep, some problems were reported especially for those having higher Awassi blood level. The farmers reported that crossbred sheep were more affected by disease and drought than the Indigenous Menz sheep. This result indicated that crossbreeding scheme should include selection within crossbred population for adaptive traits. Improvement of feed situation and strengthening the available health service should also be considered for the successfulness of distribution of crossbred rams.

Among the respondent farmers 41.11% and 25% allowed their ewes to be served by any rams in Basonawerena and Angolelatera respectively. The remaining respondent did not allow for this practice. However, those allowed their rams to serve other than their ewes were equally respond 96.67% in both districts.

Most of the individual who haven't their own crossbred ram get the service from neighbor and grazing area in both districts (Table 6).

Table 6. Way of using crossbred rams in the study site.

Way of using	Basonawerena		Angolelatera	
	N	%	N	%
neighbor	51	56.66	29	48.33
grazing area	18	20	28	46.67
payment	0	0	3	5
Neighbor and grazing area	15	16.67	0	0
hand mating	6	6.67	0	0

N= Number; %=Percentage of the respondent

### 3.8. Management of crossbred rams

About 94.44% and 93.33 % of farmers provided special management to their crossbred ram in Basonawerena and Angolelatera respectively (Table 7). The reason might be that crossbred rams need better management and are susceptible to harsh conditions. The remaining 5.56% and 6.67% of the farmers did not provide any special management for their crossbred rams in Basonawerena and Angolelatera, respectively. Type of management for crossbred ram in Basonawerena and Angolelatera was provision of supplementary feed like hay, crop residues, wheat bran groundnut cake and weed. Similarly Tesfaye (2008) stated that type of management for breeding ram in Menz area was provision of supplementary feed like hay, crop residues and weed.

Table 7. Management of crossbred rams.

Management	Districts			
	Basonawerena		Angolelatera	
	N	%	N	%
Provide special management	85	94.44	56	93.33
Didn't provide special management	5	5.56	4	6.67

N= Number; %=Percentage of the respondent

### 3.9. Perception of farmers on distributed crossbred rams

In both districts all of the farmers were interested on the distributed crossbred rams in the area. Thus, many farmers were aware and good insight with crossbred. Good things about indigenous Menz sheep as stated by farmers in both district were good taste of meat, disease tolerance and ability to thrive feed and water shortage as compared with Awassi-Menz crossbred sheep. Small size, slow growth rate, short tail as compared with Awassi-Menz crossbred sheep, perceived as the weak side of Menz sheep as stated by the farmers as compared to Awassi Menz crossbred sheep. The same result was presented by Tesfaye (2008).

When comparison was done between local sheep, 1/2 Awassi 1/2 Menz and 3/4 Awassi 1/4 Menz. Local sheep were best in meat quality, resistant to disease; 1/2 Awassi 1/2 Menz was better in horn; 3/4 Awassi 1/4 Menz was better in growth rate, wool production, market price, feed requirement and appearance in both districts (Table 8).

All of the respondent in both districts were interested in the distributed crossbred rams. The cost of distribution is also cheap based on the respondent farmers, 71% and 98.33% in Basonawerena and Angolelatera respectively.

Progeny performance of lambs, the crossbred lambs were better than the local one. In the survival of lambs the local lambs were better than the crossbred lambs. From the crossbred lambs 1/2 Awassi 1/2 Menz were better than 3/4 Awassi 1/4 Menz in survival. The farmers preferred crossbred rams to mate the new born female lambs.

## 4. CONCLUSION

The different feed resources reported in the area were natural pasture, crop residues and fallow land. Feed shortage, disease prevalence and lack of initial investment were the most important sheep production constraints in both districts. Most frequent disease occurred in both districts were fasciola (liver fluke), pasteuriosis and sheep pox.

All of the respondents interested in the distributed crossbred rams than local rams in both districts. The respondents prefer crossbred rams to be the father of the next generation. The farmers prefer crossbred lambs because of high market value, fast growth, color and appearance. In disease resistant, meat quality (test) and



resistant to shortage of water and feed traits local sheep were better than the crossbred. In both districts the respondents provide special management for their crossbred rams.

Crossbred rams are well accepted by the farmers. Crossbreed lambs distributed in the past and in present time but the follow up activities were not practiced; hence the crossbred lambs distributed in the village were not assessed at what condition they are. In general there is information gap between the distribution center and the districts as well the PAs.

The other thing related with crossbreed distribution is on genetic conservation. This may need further investigation. The result obtained on station shows no difference between crossbred lambs in growth up to six month of age. The result need to be verified on farm since the objective of the crossbreeding programs was to improve the local sheep.

Table 8. Comparison of local, 1/2 Awassi 1/2 Menz and 3/4 Awassi 1/4 Menz crossbred sheep in the study area

Traits	District					
	Basonawerena			Angolelatera		
	Index			Index		
	Local	1/2A1/2M MxM50%	3/4A1/4M M	Local	1/2 A1/2M MxM50%	3/4A1/4 M
Growth	0.05	0.09	0.09	0.06	0.09	0.12
Meat quality /test /	0.16	0.09	0.09	0.17	0.09	0.04
Wool production	0.05	0.09	0.09	0.05	0.09	0.11
Market price	0.06	0.09	0.09	0.05	0.09	0.11
Resistant to disease	0.15	0.09	0.09	0.16	0.09	0.04
Feed requirement	0.08	0.09	0.09	0.06	0.09	0.11
Colour	0.09	0.10	0.09	0.10	0.09	0.08
Horn	0.09	0.10	0.1	0.10	0.10	0.08
Tail	0.08	0.07	0.09	0.08	0.09	0.10
Mating ability	0.11	0.09	0.09	0.09	0.09	0.11
Appearance	0.08	0.10	0.09	0.08	0.09	0.10

A=Awassi, M=Menz

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