

# Traditional Breeding Management and Morpho Metric Characteristics of Indigenous Harerge Highland Cattle in Eastern Ethiopia

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## Abstract

The survey and measurements were done to identify traditional breeding management and morpho metric characteristics of the indigenous cattle in Harerge highlands eastern Ethiopia. Structured questionnaire was used to collect data from 120 households. Collected data were analyzed using descriptive statistics and index ranking. Results indicated that the household head stands first as owner of cattle. Tethering and herded grazing were the predominant feeding practice. Crop residue and natural pasture were the predominant basal diet for cattle. River and borehole were the main water sources for cattle. Disease prevention measures used were ethno veterinary medicines (51.3%), veterinary medicines (15.7%) and both (32.9%). Average peak milk yield was  $2.43 \pm 0.13$  l/day. Breeding criteria were found to use cold tolerance, walking capacity, disease resistance, draft power fecundity potential and meat palatability. Breeding bull and breeding cow remains in the farm 3-12 and 6-18 years respectively before culling. Criteria for culling young individual from the herd existed in three rank equally for male and female the first rank comprised Small body size, slow rate of growth, poor health, and bad temperament the second rank comprised Bad body condition, unfavorable color, and total infertility and third ranked comprised poor growth, inbreeding avoidance and old age.

**Keywords:** Age at first calving; body measurement; culling criteria; peak milk yield; phenotypic traits.

## 1. INTRODUCTION

Agriculture in Ethiopia is the foundation of the country's economy, accounting for 43 % of GDP and 86 percent of export earnings, and the sector employs about 85% of the population CSA (2009). Livestock production is an integral part of the country's agricultural production system. A recent study by CSA (2009) indicated that the livestock sector contributes 26% of the agricultural GDP and 12% to the national GDP and provides livelihood for 65% of the population (Ayele S et.al., 2003). Among livestock species, cattle have significant contributions to the livelihoods of the farmers CSA (2010-11). It is eminent that livestock products and by-products in the form of meat, milk, honey, eggs, cheese, and butter supply etc. provide the needed animal protein that contributes to the improvement of the nutritional status of the people and provides export commodities like live animals, hides and skins Melkau T (2011).

Cattle are also used to generate critical cash in times of scarcity, provide collateral for local informal credit and serve other socio-cultural functions in Ethiopia (Ulfina G et.al., 2005). Despite the importance of cattle to the farming community in particular and to the national economy at large, the sector has remained underdeveloped and underutilized.

The east and west Harerghe highland zones were two of the Oromia regional state zones in eastern Ethiopia where livestock production is widely practiced. The area has several and distinct local breed which the farmers identify one another with their indigenous knowledge some of which identified (eg Ogaden breed) and the rest unidentified Workneh A and Rowland J (2004). locally adapted breeds have tremendous contribution in food security for small holders Characterizing the existing locally adaptable cattle breed and /or designing appropriate breeding plan are known to be important tools to identify the existing breed potential and to have sustainable supply of animal and animal product from the area. There is very little effort done so far with the breed characteristics of cattle in the study area. The current study was there for undertaken to characterize the cattle in the highlands of Harerge and identify the traditional breeding management practice so that suitable breeding strategy could be designed and implemented for cattle in the highlands of Harerge

## 2. MATERIALS AND METHODS

### 2.1 Description of the Study Area

The Harerge highlands cover an area of approximately 1500000ha, stretching from Gelemso Asebe teferi mountain in the west to Kundudo mountain in the East. The study was conducted in East Harerge (latitude  $7^{\circ}30' - 9^{\circ}45'N$ ; longitude:  $41^{\circ}10' - 42^{\circ}50'E$ ; altitude 500-3040m) and west harerge (latitude  $7^{\circ}50' - 9^{\circ}50'N$ ; longitude

40°00′-41°25′E; altitude 1200-3060m). Administrative zones which are located in the Eastern part of Oromiya regional state and share boundaries with Somali regional state as well as the urban administrative state of Dire Dawa and Harari.

East Harerge has 18 Woredas (district equivalents) of which four are in the low lands (<1500m) and the remaining are located at high altitude ranges (>2000m) (Zonal office of Agriculture).

West Harerge is sub divided in to 11 woredas (district equivalent) the majority of which are lowland areas. Both zones have two rainy seasons the short rainy seasons and the long rainy season with the mean annual rain fall ranging from below 700 mm in the lowlands to nearly 1200 mm at higher altitudes. Most people living in Harerge lowlands are nomadic agro pastoralists who move their livestock seasonally following grazing opportunities and water availability (Zonal office of Agriculture).

## 2.2 House Hold Sampling and Data Collection

To characterise smallholder breeding management and the locally adapted breed in two zones of Harerge highlands a total of 120 house hold (74 from east harerge zone and and 46 from west Harerge zones) were purposively selected based on possession of a minimum of two cattle. The selection of the kebele (Amharic neighbourhood) was done based on the the distribution of the highlands in the two zones of Harerge. That was why more kebeles are selected from east than west Harerge zone. The selected farmers were interviewed using structured questionnaire. The major information Assessed in the survey include house hold education, cattle ownership, cattle traits preferred by the farmers, cattle husbandry, common diseases, marketable age of different class of cattle, indigenous knowledge of breeding management, reproductive characteristics of cattle, herd dynamics and culling criteria of cattle. A total of 120 adult animals 60 male and 60 female were used for morpho metric measurements. The herd were randomly selected from the participated farmers.

Morpho metric measurements involved were both qualitative and quantitative traits as indicated in table 1. Qualitative traits were described with category while quantitative traits were measured using measuring tape.

## 2.3 Data Analysis

The data were analysed by descriptive statistics using SPSS version 16.0 and Ranking was done by using index method.

Index= sum all single character rank [(5 for 1) + (4 for 2) + (3 for 3) + (2 for 4) + (1 for 5)] divided by all weighed character.

**Table 1. Morphometric traits and their categories considered for characterization of Harerge high land cattle**

Qualitative traits		Quantitative traits	
Traits	Categories	Traits	Specifications
Coat color	Red , Black , white ....	Ear length	Base of ear to point tip of the ear
Face profile	Flat, concave and convex	Horn length	Base to tip following its external curvature
Back profile	Straight or curved	Distance between horn tip	From tip of horn to other horn tip same cattle
Rump profile	Slopping, flat	Height at wither	The vertical height from ground to the point of wither
Tail length	Short, medium ,long	Heart girth	Circumference of the body behind the base of the hump and just behind the elbow of front leg
Udder size	Small, medium, large	Height at ramp	The vertical height from the ground to the point of ramp
Teat size	Small, medium, large		
Testis size	Small, medium, large		
Naval flap	Absent, present		
Size of naval flap	Small, medium, large		

## 3. RESULTS AND DISCUSSION

### 3.1 Cattle Ownership

Most of the household are headed by men 112 (93.3%) while only few headed by female 8 (6.7%) and most of the respondents were located in the rural area. House hold education level were illiterate 51 (42.5%), elementary school 45 (37.5%) and secondary school 24 (20 %). House hold cattle possession ranges 0-9, for cattle type calves, heifers, steers, bulls and cows indicated that most of the farmers in the study area were small holders. Only 1.7% of the respondents possessed' cattle number ranging from 10-19. The age at which the respondents

start to own cattle were ranging from birth-19 years of age (35.8%), after 20-39 years of age (60 %) and 40 years of age and above were (4.2%).

Household head ranked first in cattle ownership followed by the whole family together and third comes household head and spouse together and the fourth ranked was ownership by the spouse and the fifth was owned by son and the last was by the daughter (Table 2).

### 3.2 Cattle Husbandry Practice

During dry season 6 (5%) of the respondents released their cattle for grazing without herding, 8 (6.7%) grazed their cattle by herding and 106 (88.3%) of the farmers practiced tether feeding. During wet season 69 (57.5%) of the respondents practiced herded grazing, while 51 (42.5%) tether feeding. 86 (71.6%) of the respondents used natural pasture as the main basal diet and 110 (91.6%) used crop residue as main basal diet. From the result it can be inferred training of the farmers for crop residue storage and improvement techniques and/or application of the techniques have significant role in the cattle feeding and feed management for cattle in the study area specially in the dry season 67 (57.5%) used weeds as the main basal diet in wet season the results are based on multiple response. 55 (45.8%) of the respondents supplement their cattle with industrial by products, 26 (21.7%) supplement with locally available minerals Bole With regard to water source for their cattle 64.2% (77) of the respondents use river, 34.2% (41) use stream while the remaining 1.6% (2) use Borehole water.

Average distance of water source from home stead was 0.87km (ranging 0.01-3km).

Mostly family members whose age are greater than 15 years (usually men) were responsible for purchase, sale, breeding decision, health care, feeding of oxen, supplement of mineral and watering of cattle. On the other hand responsibility of sale, purchase and breeding decision when the house is headed by female; calf management, caring of sick animals, milking, processing and selling of dairy products and cleaning of barn/bomas are largely fall on the shoulder of females aged greater than 15 years.

Boys aged less than 15 usually participate in herding, feeding and watering of cattle. While daughters whose age are less than 15 usually are responsible for caring sick animal, milking, processing of milk and cleaning of barn/bomas.

The result is in agreement with the report of (Desalegn et.al.,2012) which indicated sale and purchase of cattle are mostly responsibility of male.

**Table 2. Cattle ownership of household member in the study area**

Ownership	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	Index
House hold head	39	9	19	10	43	<b>0.21</b>
Spouse	0	7	14	27	72	0.12
House hold and spouse together	19	27	5	31	38	<b>0.19</b>
Son	2	9	2	29	79	0.11
Daughter	0	3	0	31	86	0.09
The whole family	34	19	17	10	39	<b>0.2</b>
Worker / herds men	2	0	0	0	118	0.08
Total	96	74	57	138	475	1.00

*Index= sum of all single owner ship rank [(5 for 1) + (4 for 2) + (3 for 3) + (2 for 4) + (1 for 5)] divided by sum of all weighed ownership*

The common diseases affecting animals in the study area were anthrax, blackleg, bloating, “dingetegna” (sudden death), pasteureolosis, reproductive diseases and leech in decreasing order of importance. Prevention measures used by the respondents were use of ethno-veterinary medicines (51.3%), veterinary medicines (15.7%) and both ethno-veterinary medicine with veterinary medicines (32.9%). 50% of the respondents’ cattle had contact with other persons’ cattle and 27.1% had contact with wild life. The result is in agreement with the finding of (Mekonen T et.al.,2012), which indicated bloating, pasteureolosis, blackleg, Anthrax, foot and mouth disease were the major ones in cattle production of west Wellega, Ethiopia. And lower use of ethno-veterinary medicine for treatment of disease as compared to this finding.

According to the respondents, method and place of sale for cattle in the study area majorly included local market, neighbor, traders/butchers and farm-gate/at home. On the other hand, need of cash, disposal/culling of extra animal(s) and control of herd size were the major reasons for selling cattle.

#### 3.2.1 Age of selection of cattle and production in the highlands of Harerge

Marketable age of different class of cattle differed as indicated in (table3).The result implies that selection of cattle for different traits was done at different age of cattle for both bull and cow. Selection of male and female for good color was done at early age than the other characteristics followed by growth rate and disease resistance (table 4).

The milk yield result (table 5) was comparable to the report of (Desalegn et.al.,2012) on Arado cow’s milk production 1.7±0.03 liters. And also (Azage T et.al.,2009) reported an average daily milk yield of 2±0.13 litters under transhumance cattle production system in Amhara region in North Gondar, Ethiopia. But Abereham

H (2009) reported 4.5 liters per day per cow for Begait cattle breed of Ethiopia. Yesihak Y M (2011) reported 1.99±0.77 kg/ day for Ogaden breed at Haremaya University.

**Table 3. Marketable age of different classes of cattle**

Average marketable age	N	Minimum (Years)	Maximum (Years)	Mean ± SE (Years)
Calves	120	1	5	1.78 ± 0.13
Heifers	120	2	8	3.29±0.19
Steers	120	3	10	6.35±0.28
Bulls	120	3	10	5.27±0.31
Cows	120	3	10	6.28±0.27

*N* is number of respondents

**Table 4. Age of selection of Harerge highland cattle for different traits**

Trait (year/s)	N	Minimum (Years)	Maximum (Years)	Mean ± SE (Years)
Age at selecting male for meat quality	120	1	8	4.26±0.34
Age at selecting male for big body size	120	1	10	4.83±0.35
Age at selecting male for high growth rate	120	1	4	2.42±0.15
Age at selecting male for high fertility	120	3	7	5.22±0.21
Age at selecting male for disease resistance	120	1	6	2.83±0.33
Age at selecting male for good coat color	120	1	7	1.82±0.19
Age at selecting female for milk yield	120	1	8	4.14±0.21
Age at selecting female for meat quality	120	1	8	3.78±0.33
Age at selecting female for big body size	120	1	9	4.46±0.40
Age at selecting female for high growth rate	120	1	8	2.61±0.25
Age at selecting female for high fertility	120	3	8	5.68±0.20
Age at selecting female for disease resistance	120	1	6	2.70±0.30
Age at selecting female for good coat color	120	1	10	1.75±0.33

*N* is total number of respondents

**Table 5. Milk production at different lactation stage**

Milk production/cow/day	N	Minimum (liter)	Maximum (Liter)	Mean ± SE (Liter)
First months of lactation	120	0.50	3.00	1.54±0.08
Peak months of lactation	120	1.00	8.00	2.43±0.13
Last months of lactation	120	0.50	6.50	0.91±0.09

*N* is total number of respondents

**Table 6. Preferred traits/attributes of Harerge highland cattle preferred by the respondents**

Parameter	N	Number of respondent	% age
Cold tolerance	120	112	93.3
Ability to walk long distance	120	101	84.2
Disease Tolerance	120	94	78.3
Draft power	120	77	64.2
Longevity	120	77	64.2
Drought Tolerance	120	71	59.2
Temperament	120	71	59.2
Fertility	120	65	54.2
Meat quality	120	50	41.7
Body size	120	39	32.5
Growth rate	120	29	24.2
Milk yield	120	27	22.5

*Note: Data on percentage is based on multiple responses*

Perception of the farmers that Harerge highland cattle tolerance to cold, ability to walk long distance, disease tolerance, ability of draft power, higher fertility and good meat taste indicate that cattle are important to the livelihood and possess the ability to live and produce under low level of management (table 6). The present result is in agreement with previous reports, which indicated that male cattle were preferred for their draft power, body size, hump size, color and temperament, while female cattle were proffered by the farmers for their

milk yield followed by fat yield and short calving interval for Horro cattle in western Oromia (Mekonen T et.al.,2012).

### 3.2.2 Indigenous knowledge of breeding management and cattle population trend the study area

The breeding system in the study area was natural and uncontrolled breeding. 113 (94.2%) of the respondent identified dam–son relationship within a herd, 77 (64.2%) of the respondents identified sire-daughter relationship within the herd, 74 (61.6%) identified sir-son relationship within the herd, 33 (27.5%) identified grand dam-granddaughter relationship, 27 (22.5%) identified grandson –grand dam relationship and only 5 (4.2%) identify great granddaughter- great grand dam relationship within the herd 57 (47.5%).identified half sib relationship within the herd, 63 (52.5%) identified full sib relationship and only 22 (18.3%) of the respondent identified whether or not there is a relationship among animal within the herd which indicated that as the number of parents increased by one the ability of farmers tracing the relationship reduced significantly. The importance of record keeping for effective breeding plan and/ or execution is well known. However, the respondent don't practice record keeping due to illiteracy, lack of awareness, lack of habit for keeping records. 103 (85.8%) of the respondents castrate bull for the purpose of fattening, butter draft power, improved temperament and fetch for better price during sale than for control of in breeding.

Number of years a breeding bull remains in the herd until culling ranged from 3-12 years, which did have its own negative contribution for inbreeding within the herd. Number of years a cow remains within the herd until culling ranges from 6-18 years.

The present result is comparable to the report of (Mekonen T et.al.,2012) Bull remains up to 7 years of service within the farm before culling in western oromia. The same report indicated that cow remain up to 8 years service within the farm (Desalegn et.al.,2012) reported 4.6±0.06 calf crop per cow's life time of Arado breed while [3] reported 7.4±0.47 calf crop per cow's production life but higher than what was reported by Gebeyehu G (2005) at Cheffa farm in Oromia for crossbred cattle (3.58 calf crop per cow's production life).

Breeding bull possession of the respondents ranges from 1-3 i.e. 75 (62.5%) of the respondents posses one breeding bull in their herd, 12 (10%) posses two breeding bulls in their herd and 6 (5%) posses three breeding, while 27 ( 22.5%) the respondent don't have breeding bull within their herd.

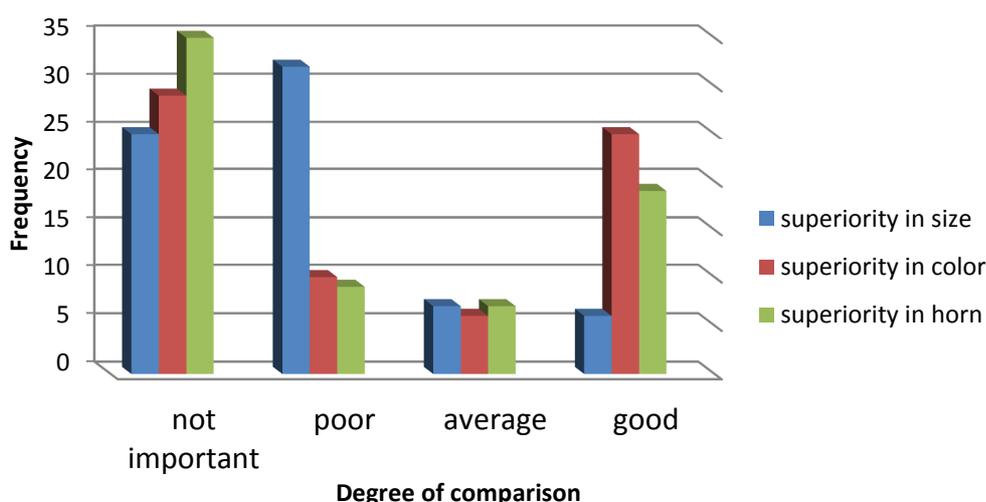
According to 65 (54.2%), 53 (44.3%) and 2 (1.4%) of respondents, the population trend for this breed was decreasing, increasing and remained stable respectively. Increased interest of farmers for the breed and availability of the breed were indicated as the reasons for the increased trend of cattle population (fig 1), while competition with other local breeds, low prolificacy and problem of management were major reasons for the decreased trend of cattle population as figured out by the respondents. Inheritance, neighbour, market, gift/pride price and own bred were origin/source of cattle breed for cattle keepers, whereas state farm and NGO/project were not indicated as a source/origin of cattle breed in the study area.

The average lactation length obtained in the present study (8.81±0.27 months) (table 7) was slightly higher than what was reported by (Desalegn et.al.,2012) 7.3 months and Kedija H (2008) reported 7.3 ±0.2 months for local cattle in the Mieso district, Oromia Regional State, Ethiopia. But the present result is comparable with what was reported by Mersha Z (2006) 242±2 days for the Aredo breed. The present result on calving interval 51.59±1.03 months was similar to what was reported by (Mekonen T et.al.,2012) age at first calving 58.08±0.07 for horro cattle Western Oromia The present result on age at first mating (40.71±0.89 for male and 40±0.94 for female) was comparable to the report of (Mekonen T et.al.,2012), which reported 46.56±0.06 for male and 48.42±0.05 months for female Horro cattle. On the other hand result on calving interval of the present study 17.74± 0.57 months was smaller than the report of (Mekonen t et.al.,2012), which indicated calving interval of 21.08±0.3, for Horro cattle, western Oromiya.

**Table 7. Reproductive characteristics of Harerge highland cattle**

Parameters	N	Min (months)	Max(Months)	Mean ± S.E (Months)
Age at first mating for male	120	24	72	40.71±0.89
Age at first mating for female	120	26	60	40±0.94
Age at fist calving	120	34	72	51.59±1.03
Calving interval	120	10	30	17.74±0.57
Lactation length	120	4	15	8.81±0.27

*N is the number of respondents*



**Fig. 1. Comparison of physical characteristics of Hararge highland cattle with other cattle breed**

### 3.3 Phenotypic Description of Hararge Highland Cattle

The dominant body color for cattle in the highlands of eastern and western Harerge was red brown followed by black then white. The profile of face of cattle in the study area was flat convex and concave. The back profile was straight and curved. Rump profile was sloping and flat in decreasing order. Tail length was medium, long and short. Udder and teat size ranges from medium to small. Testis size was between medium and small. Naval flap is usually absent and if present is small sized all in decreasing order. Ear and horn measurements were indicated in (table 8) below.

The present result (table 9) is higher than the result reported by (Desalegn et.al.,2012), which indicated  $105 \pm 1.2$ cm body length, comparable heart girth of  $140.4 \pm 1.4$ cm,  $110.1 \pm 0.8$  cm of Aredo cattle northern Tegray, Ethiopia. Male cattle in the present study have greater measurements in all parameters than females except in body length which was comparable for both.

According to observation made on Hararge highland cattle, the coat pattern of adult female was uniform 90 (75%), spotty 14 (11.7%) and shaded 16 (13.3%) and on the other hand, the coat pattern for 68 (56.7%), 2 (1.7%), 18 (15%) and 32 (26.6%) adult male cattle was uniform, pied, spotty and shaded respectively. The hair status (length) observed on 101 (84.2%) and 19 (15.8%) adult female and 93 (77.5%), 26 (21.7%) and 1 (0.8%) adult male cattle was short and medium, and short, medium and long respectively. The hair type for both 112 (93.3%) and 8 (6.7%) male and female was straight and curly respectively.

The status of dewlap was small 36 (30%) and medium 24 (20%) and absent 2 (1.6%) for female and small 17 (14.2%), medium 36 (30%) and large 5 (4.2%) for male cattle.

**Table 8. Phenotypic characteristics of Hararge highland cattle**

Phenotypic traits (cm)	N	Minimum (cm)	Maximum (cm)	Mean $\pm$ SE (cm)
Ear length of adult female animal	60	10	24	18.30 $\pm$ 0.31
Ear length of adult male animal	60	14	32	19.64 $\pm$ 0.35
Horn length of adult female animal	60	7	48	23.03 $\pm$ 1.02
Horn length of adult male animal	60	6	55	20.53 $\pm$ 1.09
Distance between horn tips of adult female animal	60	24	67	42.47 $\pm$ 1.17
Distance between horn tips of adult male animal	60	13	65	43.80 $\pm$ 1.23

*N is the number of animal from which the measurement was taken*

**Table 9. Linear body measurement of female Hararge highland cattle**

Female				
Character	N	Minimum (cm)	Maximum (cm)	Mean ± SE (cm)
Height at wither	60	110	123	113.97±0.33
Heart girth	60	111	153	134.06±1.37
Body length	60	105	188	125.53±1.80
Height at ramp	60	111	175	124.39±2.09
Male				
Character	N	Minimum (cm)	Maximum (cm)	Mean ± SE (cm)
Height at wither	60	103	214	117.66±1.55
Heart girth	60	112	235	147.90±2.29
Body length	60	106	171	124.11±1.30
Height at ramp	60	111	216	119.14±1.55

*N is the number of animals from which the measurement was taken*

### 3.4 Herd Dynamics

The number of male animals born and added to the herd within 12 months before this survey was 2, 1 and 0 for 3 (2.5%), 39 (32.5%) and 77 (64.2%) respondents respectively, whereas, 9 (7.5%), 45 (37.5%) and 67 (55.8%) of the respondents got female animals added to their herd in similar order of number of animal as described for male animals. While 4 (3.3%), 17 (14.2%) and 100 (83.3%) of the respondents bought and added 2, 1 and 0 male animals to their herds respectively within the last 12 months prior to this survey work. It was only 17 (14.2%) of the respondents who bought and added a female animals to their herds. The number of female animals added to herd through donation/gift was 2, 1 and 0 for 2 (1.4%), 5 (4.3%) and 113 (94.3%) of the respondents respectively, but only 1.4% of the respondents added a male animal to their herd. On the other hand, within the last 12 months before this survey, both male and female animals were removed from the herd through selling, slaughtering and death. The number of male and female animals removed from the herd was 2, 1 and 0, and 3, 2, 1 and 0 for 2 (1.4%), 50 (41.7%) and 69 (57.1%), and 2 (1.4%), 4 (2.9%), 21 (17.1%) and 94 (78.6%) of respondents respectively. Removal through slaughter for both male and female cattle was zero.

### 3.5 Culling Criteria for Young Growing Cattle in the Study Area

Culling criteria for young growing male and female cattle were indicated in (table 10&11). The presence of locally diversified cattle breed in the study area which the respondents could identify by their distinct features and production targets namely Ogaden, Doba, Batu Abadho, Etu, Hawiya, Tumiro, Aroji, Wabora, Rogitu, Obora, Adal, Asebote, Maye, Mayo, Messela, Alaa, Rehorned, Fedis, Tullo, Jijiga, Baku, Momu, Afraan qalo, Fatah (Somali), Nole Short breed and Mola Workneh Ayalew and Rowland J (2004) makes the area endowed with different breeding options for improvement in the future.

**Table 10. Culling criteria for young male cattle for the respondent in the study area**

Criteria	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	Index
Small size	10	24	7	27	51	0.13
Bad shape	0	3	3	36	77	0.08
Un Wanted color	5	2	3	15	94	0.08
Slow growth	15	14	5	41	46	0.13
Bad temperament	14	5	9	26	67	0.11
Poor health	12	14	3	39	51	0.12
To avoid in breeding	0	2	2	0	116	0.06
Poor production	0	2	0	7	111	0.06
Old age	0	2	0	2	116	0.06
Infertility	0	5	5	15	95	0.08
Bad body condition	3	5	3	29	80	0.09
Total	59	78	40	237	904	1.00

*Index = sum of all single criteria rank [(5 for 1) + (4 for 2) + (3 for 3) + (2 for 4) + (1 for 5)] divided by sum of all weighed criteria*

**Table 11. Culling criteria for young female cattle for the respondent in the study area**

Criteria	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	Index
Small size	10	17	7	14	72	0.11
Bad shape	2	2	2	36	78	0.09
Un wanted color	3	3	2	15	97	0.08
Slow growth	14	15	5	38	48	0.14
Bad temperament	9	2	14	21	74	0.10
Poor health	10	12	5	38	55	0.12
Avoid in breeding	0	2	0	0	118	0.06
Poor production	0	2	0	5	113	0.07
Old age	0	2	0	0	118	0.06
Infertility	3	5	7	9	96	0.09
Bad body condition	0	2	3	34	81	0.08
Total	51	64	45	210	950	1.00

*Index= sum of all single purpose rank [(5 for 1) + (4 for 2) + (3 for 3) + (2 for 4) + (1 for 5)] divided by sum of all weighed purpose*

#### 4. CONCLUSIONS

The possession of cattle and activities like sale and purchase of cattle were the responsibility of the male in the study area except when the house is headed by female.

Husbandry practice like breeding decision, health care, and supplement of mineral especially for oxen and watering of cattle were the work of male. On the other hand management of calves and sick animals, milking, milk processing, marketing and cleaning of the cattle shed were the responsibility of females.

Absence of habit of keeping records of the cattle reduced the farmers' knowledge of relationship among cattle within the herd. Training on record keeping is one of the venture worth focusing for breeding improvement in the future.

Breeding bull remains within the farm 3-12 years before culling in the study area. The longer a given breeding bull remains within the farm the higher will be the inbreeding effect/impact on the herd.

Small body size, slow rate of growth, poor health, and bad temperament were major and equally important criteria for the farmers to cull young male animals from the herd. Bad body condition, un wanted color, were the second major and equally important criteria for culling young male animal from the herd. Poor production (growth), avoidance of inbreeding and old age were the third important criteria for culling young male animal from the herd.

Slow growth, poor health, bad temperament and small size were equally important criteria which ranked first as reason for culling young female animal. While infertility, bad shape, bad body condition and unfavorable color were the second important criteria for culling young female cattle.

#### 5. RECOMMENDATIONS

Training of the farmers on the record keeping and systematic breeding (inbreeding problem they are going to face and face and its impact on the performance of their herd) will have a tremendous value addition to the traditional breeding management and breed improvement practice in the area.

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