

## **Breeding Practices of Dairy Cattle in and around Assosa Town Bekele Hailu, Dasash Kassa and Abdi Abdulahi, Assosa University**

### **Abstracts**

*The study was conducted on breeding practices of dairy cattle in and around Assosa Town with the aims to assess indigenous dairy cattle Breeding Practices of the communities, and major conformational traits particularly used by smallholders in selecting better dairy cows. Assosa Town (kebele 04 and kebele 02) and surrounding (Amba 5 and Amba 3) were selected purposively because these peasant associations are relatively higher dairy cow owners. Interviews using structured and semi-structured questionnaires were used to general data collection. SAS was employed to analyze the data. The most common mating system in all sites was natural free mating, but natural, controlled and AI also existent in small frequency. The first breeding objective of the community in Assosa town was obtaining better milk yield. The producer trait preference was higher milk yield, faster growth rate and adaptability to local feed condition and disease. In rural villages the first breeding objectives of the respondents was plough purpose. Among the selection criteria of the respondent for dairy cows, udder size, teat size, body length and growth rate were commonly stated and udder size and teat size hold the first and the second ranks in all study sites, respectively. The three main constraints of dairy cattle breeds in the study area were disease, feed, and water shortage respectively.*

**Key words:** *Breeding, Cattle, Constraints, Dairy*

### **1. Introduction**

#### **1.1. Background**

After cattle were domesticated, specialized breeds were developed with in improved dairy or beef production. Domestic animal production has proven to be good sources of food all over the world. And a rapid growth in milk and dairy consumption has been seen in many developing countries over the last years (FAO, 2002).

In dairy cattle breeding most of the dairy farmers in the highland, midland and lowland areas of Ethiopia used natural mating by using indigenous bulls. But cross-bred bulls in the highland and island agro-ecologies were used for service. Some farmers used Artificial Insemination (AI) along with natural mating in highland and midland areas. Some of the farmers also preferred seasons for mating for their dairy cattle. They mate their cows in such a way that the calving falls during the wet season to take the advantage of abundant feed supply which promotes better milk production and hence a better chance of survival of calves (Testa, 2009).

Conformation traits have been known to have medium to high heritability (Kistemaker and Flugauya, 2006) and often can be recorded in a single assessment, which make them reliable and relatively cheap traits that can be included in selection indices for several purposes. In some parts of Ethiopia, farmers exercise selection for dairy cows depending on the appearance of some conformation traits and milk production history of the ancestor (Zewdu, 2004 and Takele, 2005).

In Ethiopia, the human and animal populations are very much affected by nutritional problems; primarily due to lack of high nutritional value feed (Gebrekidan, *et.al*, 2012). In order to address this problem and upgrade the nutritional status of the population, actions

should be taken to improve animal production so as to ensure better supply of animal protein of high nutritive value (Lebir, 1992). Among animal protein, milk is the one whose demand continues to increase and plays a very important role in feeding the rural and urban population of Ethiopia (Asaminew, 2007).

Therefore, in order to meet this demand, it is essential to improve the potential milk production status of dairy cattle through selection and breeding of cows by conformation traits.

## **1.2. Statement of the Problem**

Although the farmers in and around Assosa Town practice natural breeding system of dairy cattle, they are not aware of the benefits of artificial breeding clearly and properly. And in-depth research work has not been done regarding the Breeding Practices and the existing problems that hinder the efficiency of AI service in the area. So this study is aimed to assess those problems and put more advance information for dairy cattle owners on the challenges of production.

## **1.3. Objectives**

### **1.3.1. General Objective**

To investigate the breeding and selection practices of dairy cattle breeds in and around Assosa Town.

### **1.3.2. Specific Objectives**

- To identify dairy cattle breeding activities of the community in the study area,
- To identify major traits particularly used by small holder in the selection of better dairy cow,
- To identify the major constraints of Breeding Practices in the study area.

## **1.4. Significance of the Study**

This study is aimed to contribute to a general understanding of breeding practices for dairy cattle owners, identify the challenges and to provide baseline information for their further studies. It could be used as secondary information as well as to increase awareness for the owners.

## **2. Materials and Methods**

### **2.1. Description of the Study Area**

The study was conducted in Assosa Town and surrounding villages located in Benishangul Gumuz Regional States, in Assosa zone, Assosa woreda, which is located at a distance of 667 km from Addis Ababa. Its geographical location is 10<sup>00</sup>' and 10<sup>03</sup>' north Latitude and 34<sup>0</sup> 35' and 34<sup>039</sup>' east Longitude. The Town of Assosa was founded in 1936. Assosa has two municipality administrations, and 4 kebeles. The town has an integrated development plan, which was prepared in 2006.

### **2.2. Data Collection**

Data were collected by using primary and secondary data sources. A total of 79 households were selected purposively. The data were collected primarily by preparing questionnaires, and interviews. The secondary data was collected from sources like agricultural offices and from the internet on the breeding system of dairy cattle. Two PAs found in Assosa Town

were addressed to select the sample households who have dairy cattle. Respondents were selected from each kebele based on the total number of the population.

### 2.2.1. Sampling Techniques

All the PAs in Assosa Town were addressed to get enough number of households who have dairy cattle for this particular study. Accordingly, 20 households in the three kebeles (kebele 04, Amba 3 and Amba 5) and 19 from kebele 02 were selected. That makes the total household 79 for the study. The households were selected purposively by setting the criteria of having dairy cattle. The research team interviewed the selected households to generate data on Breeding Practices of dairy cattle.

### 2.2.2. Data Analysis

The data collected from the households were entered in Microsoft excel, analyzed and organized by using descriptive statistics like mean, frequency and percentage. And data outcome was presented in the form of tables by using SAS, 2008 (Statistical Analysis System). Ranking index was used to express the data, like purpose of keeping the dairy cattle, constraints of breeding practice, and the selection criteria to prefer the best dairy cow.

## 3. Result and Discussions

### 3.1. Socio Economic Characters of the Respondents

The general characteristic of the household in the study area is presented in table1. The study revealed that about 49.4% of the respondents were illiterate while 50.6% were educated. From educated respondents the individuals who have diploma were few, only 2.5%. Concerning the gender of respondents 68.4% were male and 31.4% were female. Concerning their marital status, 68.4% were married. The percentages of single respondents in the study area were 26.6%.

**Table 1: Households Character in the Study Area**

Characters	Number of respondents	Percentage
<b>Gender</b>		
Male	54	68.36%
Female	25	31.36%
<b>Marital status</b>		
Married	54	68.36%
Single	21	26.58%
Divorced	4	5.06%
<b>Educational status</b>		
Illiterate	39	49.37%
Primary	33	41.77%
Secondary	5	6.33%
Diploma	2	2.53%

### 3.2. Breeding Practices and Management

The Breeding Practices reported in the study area is generally a natural mating. AI is rarely practiced in the study area. Bulls can be used for two main types of natural mating, either free mating in the ranch or controlled mating. In the farmer system heat detection is carried out by the bull and cow. The bull and cow usually mate several times during each heat

period. In controlled mating systems, heat detection is carried out by the farmer and each cow is mated once or twice during each heat period.

In the study area 70.6% of the respondents practice natural free mating, which means there was no selection of breeding bulls. Since the production system is extensive, cows can be mated easily at communal grazing lands. Around 26% of the respondents practice natural controlled mating, which mean bulls were selected and allowed to mate cows. The remaining 3.4% of the sampled household use AI technology trough AI technicians.

**Table 2. Reported Frequency of Weaning, Castration and Mating by Study Area**

Management practice	Kebele 04		Kebele 02		Amba 3		Amba 5		Overall	
	N	%	N	%	N	%	N	%	N	%
<b>Weaning practice</b>										
Yes	1	5.0							1	1.3
No	19	95	20	100	20	100	19	100	78	98.7
<b>Castration practice</b>										
Yes					5	25	3	15.8	8	10.1
No	20	100	20	100	15	75.0	16	84.2	71	89.9
<b>Mating system</b>										
Controlled natural	6	30	9	45	2	10.5	3	15	20	26.0
uncontrolled	12	60	10	50	18	89.5	16	85	56	70.6
AI	2	10	1	5					3	3.4

### 3.3. Breeding Objective

Breeding objective is defined as the reasons for which animals are specifically bred, assuming that farmers have made a deliberate choice to genetically improve the next generation of animals in terms of their performance in relation to their parent generation. The focus is therefore on one or more traits. The first important breeding objective stated by the sampled producers in kebele 04 and kebele 02 was to obtain better milk yield. This is similar to the result of a previous study by Zewdu (2004). Milk was mentioned as one of the most important functions of the local cattle and one of the primary reasons for keeping indigenous cattle. An increase in milk yield will bring additional income from the sale of butter. More milk production also means better feed calves that will have better survival rates.

These calves will also grow better, and hence reach puberty earlier than those reducing age at first calving (Zewdu, *et al.*, 2006). Similarly, Piotr, *et al.* (2004) also reported that recently the cattle breeding objectives are focused on the increase of milk yield, under the assumption that profit would increase with increased yield per cow. In addition to increasing milk production, obtaining of good breeding bulls, good mothering ability, and shortening of calving interval were aimed at the same time. The farmers believed that good breeding bulls bring gross improvement through natural control mating system. Keeping desirable bulls can contribute to improve herd performance over time. Mothering ability of the cow is also taken into consideration. Docility of the dairy cows at the time of milking and any management aspect is also considered important. The sampled households are also keen to have more calves per cow. This is obtained through shortening of calving interval. They

believe that shortening of calving interval is achieved by selecting for ancestors that have short calving interval.

The Second objective the respondents to draft power which have an index value of 0.26 which indicates the dairy cows contribute for crop production in this study. Most of the study community uses their cow for draught purpose.

**Table 3: Frequency of Reported Reason for Breeding Cattle in the Study Area**

Purpose	Rank				Rank index
	Rank 1	Rank 2	Rank 3	Rank 4	
Milk	49	21	6	3	0.36
Draft	24	17	9	29	0.26
Income	4	33	29	13	0.25
Meat	1	3	5	70	0.12

### 3.4. Selection Practices

In all the study sites, selections for both male and female animals were practiced by most of the respondents. Selection takes place not only at the time of mating but also starts from the early age of the calf. In all study sites the first purpose was selecting a bull that is suitable for breeding purpose depending on good physical appearance, known desirable pedigree history in milk yield, good reproductive performance and tolerance for seasonal feed scarcity and disease challenges. The final reason for selection of male animals reported by the sampled farmers was market demand. In cattle markets buyers prefer male animals with attractive body color, good body condition and balanced physical posture.

### 3.5. Indigenous Dairy Cow Selection Criteria

All respondents reported that, selection of cows takes place by considering expected milk production potential. To achieve this, farmers apply their own selection criteria. This includes body conformation and the performance of history of their ancestors. All respondents indicated that conformation traits are used to select for good milking cows. Four conformational traits were identified and ranked by respondents. As the percentage index indicates the ranking order was the same in each study sites. In all study sites the same traits were identified and also ranking were the same. Udder size was ranked first for selecting breeding and lactating cow followed by teat size. Next to teat size, body length and growth rate were identified, respectively.

**Table 4: Ranks of Conformational Traits used for Selecting Dairy Cows in the Study Area**

Traits	Body conformation traits Ranks for selection purpose				Rank index
	Rank 1	Rank 2	Rank 3	Rank 4	
Udder size	53.17	25.32	17.72	3.79	0.31
Body length	17.72	35.44	27.85	18.98	0.23
Teat size	29.11	24.05	24.05	22.78	0.24
Growth rate	20.25	26.58	29.11	24.05	0.22

### 3.6. Major Constraints in the Study Area

In the process of data collection, households were asked to list all problems that affect dairy cattle production in the study area. The primary problem identified by respondents was disease called trypanosomiasis or locally called "*Gendi*". It is the most serious problem in all the study sites. Next to the disease, lack of feed and lack of water were reported to be the most limiting factors to cattle breeding practices. Since permanent water source is not available around their villages, the farmers travel long distance from their residence in search of water for themselves and their livestock. Yet, they do not get clean water. The other problem recognized by respondents was the management problem. The farmers could not provide enough feed and water for the livestock and also the cattle were kept in very poor housing system. AI services in the study area were not successful to improve reproductive and productive performance of dairy cattle. The problem is more aggravated by unorganized cross breeding program, absence of cross breeding policy, lack of record to evaluate the performance from lower farmer level and absence of incentives and rewards to motivate AI technicians and also same AI technicians do not provide AI service at the required time or during when the cow is in heat period.

**Table 5: Major Constraints in the Study Area**

Constraints	Ranks of the major constraints for breeding practice					
	Rank1	Rank2	Rank3	Rank4	Rank5	Index
Disease	44.3	43.04	6.73	5.06	1.27	0.22
Lack of feed	40.50	32.91	11.39	8.86	6.33	0.21
Lack of water	37.97	25.32	22.78	8.86	5.06	0.20
Management problem	30.38	26.58	25.31	15.19	2.53	0.19
Lack of AI service	35.44	24.05	24.05	0.127	7.59	0.18

## 4. Conclusions and Recommendations

### 4.1. Conclusions

Natural mating was common practice; and bulls are available from their herd and neighbors. Obtaining selected or desirable breeding bulls for estrous cows during heat period is reported as difficult task. The breeding objectives in each study site were better milk yield, getting good bull for breeding and good mothering ability of cows. In general, selection for milking cows was reported to be based on conformation traits of the cows and heifers, some background history of their ancestors. The four most useful traits used for selection of dairy cows were udder size, teat size, body length and growth rate. The major preferred traits in the study area were milk yield, growth rate, adaptation, and draft power. In all study area selection for both male and female animals was practiced by most of the respondents. Selection takes place not only at the time of mating, but also starts from early age of the calf. Bulls are selected for breeding purpose based on good physical appearance, known desirable pedigree history in milk yield, good reproductive performance and tolerance to seasonal feed scarcity and disease challenges.

The major constraints identified by the respondents were a disease locally named as tripanosomiasis "*gendi*," adequate provision of nutrition, in adequate water supply,

management related problems and lack of AI service. All these problems are common to all the study sites. *Gendi* is the most serious problem both in Assosa Town and the surrounding villages.

#### 4.2. Recommendations

Unorganized cross-breeding program, absence of cross-breeding policy and lack of record to evaluate the performance from small-scale farmers are some of the constraints and need immediate action to improve Breeding Practices in dairy cows.

- To improve breeding practice, local animals must be safeguarded to maintain purity.
- Record must be kept to evaluate best performing animals; and a breeding policy should be developed.
- Improvement in environmental aspect and strengthening input supply systems for cross-breeding programs is a critical issue and should be given high consideration.
- The productivity of dairy cows remains low in all study sites due to lack of animal health service, lack of nutrition and other management related problems. Hence, to reduce these problems, animal health service should be extended both in the town and the rural area and also training should be given to farmers how to prepare silage and use it during drought season.
- In the study area, especially in Amba 3 and 5 farmers use their cows for ploughing land. This is one factor that reduces milk production obtained from the cows. Therefore dairy cows should not be used for drafting purpose and the farmers should use oxen for this purpose.
- In order to make farmers good users of AI service, they should be given training to get enough awareness and should be trained as AI providers.
- Generally, agricultural extension agents should create awareness among farmers how to manage their livestock properly and to improve the product and productivity of their livestock.

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