COLLEGE OF AGRICULTURE AND NATURAL RESOURCE

DEPARTMENT OF ANIMAL PRODUCTION AND TECHNOLOGY

ASSESSMENT ON REPRODUCTIVE PERFORMANCE AND MILK YEILD OF WOLKITE UNIVERSITY DAIRY FARM

BY:

1. **BeyeneTedla**
2. **AsferachewAnasha**
3. **Samato Shako**

Advisor: Mr. Feki Misbah (M.Sc).

A senior Research project

Submitted to Department of Animal Production and Technology in Partial Fulfillment for the Requirements of Bachelor Degree in Animal Production and Technology

Wolkite, Ethiopia

June, 2019

APPROVAL SHEET

WOLKITE UNIVERSITY

COLLEGE OF AGRICULTURE AND NATURAL RESOURCE

DEPARTMENT OF ANIMAL PRODUCTION AND TECHNOLOGY

ASSESSMENT ON REPRODUCTIVE PERFORMANCE AND MILK YEILD OF WOLKITE UNIVERSITY DAIRY FARM

Senior Research Project Approval Sheet

Submitted by:

Name of the students	**Signature**	**Date**
1. _____	_____	_____
2. _____	_____	_____
3._____	_____	_____

APPROVED

By,

Mr: Feki Misbah _____ _____

Name of Advisor

Mr:MosaMitiku _____ _____

Name of Dep't Head\ \

Mr: Wondessen Ayalew _____ _____

Name of Examiner

TABLE OF CONTENT

Contents **Page**

APPROVAL SHEET i

TABLE OF CONTENT ii

ACKNOWLEDGMENTS iv

LISTS OF ABBREVIATION v

LIST OF TABLE vi

ABSTRACT vii

1. INTRODUCTION 1

1.1. Back ground of the study 1

1.2. Statement of the problem 3

1.3. Objective of the study 3

1.3.1. General objectives 3

1.4. The significance of the study 4

1.5. Scope of the study 4

1.6. Research questions 4

2. LITERATURE REVIEW 5

2.1. Reproductive Performance of Dairy Cattle 5

2.2. Number of service per conception 6

2 .3. Calving interval 7

2.4. Days open 7

2.2. Productive Performance 8

2.2.1. Daily milk yield 8

2.2.2. Lactation length 9

2.2.3. Lactation milk yield\ 10

3. MATERIALS AND METHODS 11
3.1. Description of Study Area 11
3.2. Method of Data Collection 11
3.3. Data analysis 11
3.4. Back ground information of WKU dairy farm 12
3.5. Herd composition of the farm 12
3.6. General husbandry practice 12
4. RESULT AND DISCUSSION 14
4.1. Reproductive performances 14
4.2. Number of service per conception 14
4.3. Days open 15
4.4. Calving interval 15
4.5. Milk yield 16
4.5.1.1Daily milk yield 16
4.5.2. Lactation milk yield 16
4.5.3. Lactation length 17
4.6. Constraint and opportunities of wku dairy farm 18
4.6.1. Record keeping system 19
5. CONCLUSIONAND RECOMMENDATIONS 20
6. REFERENCES 21
7. APPENDIX 26

ACKNOWLEDGMENTS

First and foremost, we would like to thank the Almighty of God for blessing invaluable gifts of health, strength, believes, love, hope, patience and protection to ours and our families.

Throughout life. We are very much indebted to acknowledge our research advisors Mr. Feki

Misbah (MSc),his encouragement, , friendly treatment. We would also like to thanks to Mr: Bereket and Mr: seraji for allowing us to use their farm record.

LISTS OF ABBREVIATION

AMYD	Average Milk Yield Daily
AFC	Age at First Calving
AFS	Age at First Service
AI	Artificial Insemination
AMYPD	Average Milk Yield Per day
AMYPL	Average Milk Yield Per lactation
CI	Caving Interval
CSA	Central Statistical Agency
DO	Day Open
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
IAR	Institute of Agricultural Research
ILRI	International Livestock Research Institute
LL	Lactation Length
LMY	Lactation Milk Yield
MAIE	Menkorer Agro -Industry Enterprise
MOA	Ministry of Agriculture
MYPD	Milk Yield per Day
MYPL	Milk Yield per lactation
NSC	Number of Service per Conception
SNNPRS	Southern Nation, Nationalities and People Regional State
SPSS	Statistical Package for Social Science
WKU	Wolkite University

LIST OF TABLES

Table1: some values of number of services per conception estimated by different researcher 6

Table 2. Calving intervals of cattle in Ethiopia 7

Table 3. Average lactation length of zebu and cross breed cow 10

Table 4. Herd composition of wku dairy farm 12

Table **5**. mean and standard deviation of reproductive performance and milk yield of crossbreed dairy cows in WKU dairy farm 15

Table 6:.show the mean and standard error of first stage, mid stage, late stage of lactation 16

Table 7. Show disease occurrence and their rank from 2009-2011E.C. 18

ABSTRACT

The main aim of the study was to assess the milk yield and reproductive performance of cross breed dairy cows in WolkiteUniversity dairy farm. A total of 14 crossbreed cow record were used to evaluate reproductive performance and milk yield as well as key informant interview with semi – structured questionnaire was used to collected general management information about the farm and cross check recorded data. SPSS were used to analyze the data. The results of the study showed that the mean calving interval, days open and number of service per conception were 400.07±3.09 days, 93.07±2.44 days and 1.96±0.16 respectively. Similarly, average lactation length, daily milk yield and lactation milk yield of 277.21±4.39 days, 8.12±2.23 litter and 1977.21±51.27 litter were found respectively. The major constraints reported were lack of road for the transportation of feed, poor management, disease prevalence like calve fever, mastitis, anemia, heart water (acidosis), bloating.It can be concluded that the reproductive performance of the crossbreed are comparatively good. However, average milk production is lower than below the optimum recommended level (about 10 litres per day per cow) despite the good opportunities the University have. Therefore, through step by step improvement of the management practice increase in milk production should be improved. If improvement in the management practice doesn't boost milk yield, breed improvement can be implemented.

Keywords, *Calving interval, reproductive performance, milk yield*

1. INTRODUCTION

1.1. Back ground of the study

Ethiopia has the largest livestock inventory in Africa and possessed 59.5 million heads of cattle, 30.7 million heads of sheep, 30.2 million heads of goats,11.01 million heads of equines,1.21 million heads of camels and 56.56 million of poultry (CSA, 2016/17). Livestock production is an integral part of agricultural activities in Ethiopia. The livestock sector accounts for about 40% of agricultural GDP and 18% of overall GDP in Ethiopia (FAOSTAT, 2004). Currently livestock contribute 35-49% of agricultural GDP in Ethiopia (Sintayehu et al., 2008). Moreover, livestock contributes about 60-70% of the livelihoods of the Ethiopia population (Ayele et al., 2000; Tessema et al., 2010).

In Ethiopia dairy production depends mainly on indigenous livestock genetic resources; more specifically on cattle, goats, camels and sheep. Cattle have the largest contribution (81.2%) of the total national annual milk output, followed by goats (7.9%), camels (6.3%) and sheep (4.6%), (CSA 2009). Despite its potential for dairy development, productivity of indigenous livestock genetic resources in general is low, and the direct contribution it makes to the national economy is limited. A recent report by CSA (2014/15) indicated that the total production of cow milk is about 3.07 billion liters, and this translates to an average daily milk production/cow of 1.35 liters/day. As a result the per capita milk consumption of the country is only 19.2 kg (MoA, 2012), which is much lower than Africa and world per capita average of 27 kg/year and 100 kg/year, respectively (CSA, 2014/2015).

The country has great potential for increase livestock production in domestic and export market. However, development of the dairy sector has been constrained by inadequate nutrition, diseases, lack of service like extension service, and weakness of policy to improve animal genetics/breeding, market and processing. Different authors have been described constraints at different level that affect livestock production in the country.

Berekedu*et al* (2000) indicated that in adequate feed and nutrition, widespread disease, poor breeding stock, and inadequate livestock policies with respect to credit, extension, marketing and infrastructure as major constraints affecting livestock perform Though, there is huge livestock resource in the pastoral communities of Ethiopia in general and pastoralists in Borana zone of Oromia regions in particular, they are not economically benefited out of it in the extent at which ought to be. Consequently, their livelihood is vulnerable to different natural and artificial shocks (Katesedler*et al*., 2009)

Among the reproductive traits, age at first service (AFS), number of service per conception (NSC), days open (DO) and calving interval (CI) and bases for profitable dairy farming (Enyew, etal, 1999).Factors affecting reproductive performance are associated to either to the management factors (such as methods of husbandry, feeding, estrus detection, semen handling and transition cow management) or the cow factors (such as age, body condition score (BCS), postpartum problem, disease events, milk yield, and genetics. (Lucy 2001; Hudsonetal, 2012).

Insufficient reproductive performance results in excessively late age at first calving and long Lactations when both are costly to the dairy producers because of the expenses on breeding, High costs of replacement and fewer calves are born (Oudah*et al*., 2001). Low reproductive Efficiency due to either delayed first service, missed estrus, or multiple services per Conception continues to be a major problem in dairy herds. Several reports have showed that poor reproductive performance, revealed as prolonged calving intervals, can result in reduce Dairy production.

1.2. Statement of the problem

Even if Ethiopia has a large cattle population the reproductive performance and the productivity of the indigenous cattle breed is low. Usually, cows do not produce their first calves earlier than 35-53 months of age and calving interval is about two years. (Chera Tet al., 1999). And *Demand* for milk and milk products are highly increasing through time. However, the supply for this demandable product is not sufficient this is the results of inadequacy of production inputs like, feed, land, capital and production skills, poor extension service and poor management. The main determinant issue is environmental and genetic factor that determines the milk yield, lactation length, lactation period.

1.3. Objective of the study

1.3.1. General objectives

- To assess the productive and reproductive performance of wku dairy farm
- **1.3.2.Specific objectives**
- To assess the milk yield of cross breed cows at wku dairy farm
- To assess reproductive performance of cross breed dairy cow of wku farm
- To assess the constraints which affect the reproductive performance and milk yield of wku dairy farm

1.4. The significance of the study

This study would show the reproductive performance and milk yield of dairy cows to satisfy the milk demand of increasing population. This study would help to empower crossbreeding of dairy cattle by increasing awareness to increase milk yield,. The study also tries to compare the daily milk yield, lactation length and lactation milk yield of cross breed dairy cattle and to generate baseline information for further researchers

1.5. Scope of the study

This study was intended to identify the reproductive performance and milk yield of crossbred dairy cattle in wku dairy farm

1.6. Research questions

- Does the milk yield of crossbreed dairy cows below the expected level at the farm?

2. LITERATURE REVIEW

2.1. Reproductive Performance of Dairy Cattle

Dairy herd profitability is highly dependent on reproductive performance. Reproductive performance is biologically crucial and vital for the profitability in many animal production systems. The economics of dairy enterprise is based on efficient reproductive performance of dairy animals (Negussiet*al*., 1998).Highlighted the importance of measuring reproductive performance in cows. The most common indices of reproductive performance are age at first service (AFS) and age at first calving (AFC), day's open (DO), calving interval (CI) and number of service preconception (NSPC). Lowered breeding efficiency rates can be due to long calving interval which is mainly due to either low conception rate or high early embryonic mortality (Hammond M et *al*., 2010).

Insufficient reproductive performance results in excessively late age at first calving and long lactations when both are costly to the dairy producers because of the expenses on breeding, high costs of replacement and fewer calves are born (Oudah*et al*., 2001). Low reproductive efficiency due to either delayed first service, missed estrus, or multiple service pre conceptions continues to be a major problem in dairy herds. Several reports have showed that poor reproductive performance, revealed as prolonged calving intervals, can result in reduced milk yield and increased culling rates and replacement cost (Kadarmideen*et al*., 2003; Sewalem*et al*., 2008).

The calving interval affects both the total milk production of the dairy herd and the number of calves born. In most modern dairies farm the general practice is to breed cows early, with the aim of establishing a calving interval of 12 to 13 months, which is considered optimum; hence, calving interval is considered an important index of reproductive performance (Arbel*et al*., 2001). Poor fertility decreased the profit margin due to loss in milk yield, cost of replacing culled cows and decreased calf sales per cow. Darwash, *et al*. (1997) classified poor fertility of cows into four categories, which included failure to undergo ovarian cycles (anoestrus), failure to exhibit estrus at the appropriate time (behavioral anoestrus), failure to conceive when mated or inseminated and embryonic or fetal losses. Generally, reproductive efficiency in dairy cows are decreasing worldwide (Hammond *al*., 2010). The shift toward more productive cows and larger

herds is associated with a decrease in reproductive efficiency. Cows with the greatest milk production have the highest incidence of infertility (Lucy, 2001).

Beaver., (2006) reported that average dairy herd fertility is declining, with more service per successful conception, extended calving intervals and increased culling due to failure to rebreed, all adding significant costs to milk production. Genetics, management and nutrition have all contributed to this decline in fertility. Therefore, the optimal reproductive traits depend upon the interactions of genetic, nutritional, physiological and environmental reason. Hence, appropriate reproductive management and evaluation of reproductive performances are highly desired in Ethiopia (Emebet M, 2006)

2.2. Number of service per conception

The number of services per conception (NSC) is the number of services (natural or artificial), required for successful conception. The number of inseminations required to produce a live calf is one of the most useful parameters of reproductive efficiency which mainly depends on the breeding system used. It is higher under uncontrolled natural breeding than hand-mating andartificial insemination. The optimum recommended NSC for profitable dairy cows ranges from 1 to 1.7 (Evelyn, 2001). Although several studies estimated NSC in Ethiopia, the results are variable due to various reasons.

Table1: some values of number of services per conception estimated by different researcher

Breed	NSC	Site	Source
Cross breed			
Cross cows	4.91	on farms	AdebabayKebede(2009)
Cross cows	1.88	on farms	HaileyesusAbat(2006)
HF x lowland dairy cows	2.2	SSDP-L SDP	Emebet and Zeleke (2007)

2 .3. Calving interval

Calving interval refers to the period between two consecutive calving and is a function of days open and gestation length (Kedija, 2008; Gidey, 2001). Calving interval is probably the best indicator of a cow's reproductive efficiency. Estimates of calving interval in zebu cattle range from 12.2 to 26.6 months (Mukassa-Mugrewa*et al*., 1989).

Table 2; Calving intervals of cattle in Ethiopia

Breed	CI (month	Site	Source
Crossbreds			
Cross cows	16.2	On-farm	AdebabayKebede (2009)
F1 Friesians	15.5	On-farm	HaileyesusAbate (2006)
HF x lowland dairy cows	17.8	SSDP-LSDP	Emebet and Zeleke (2007)

2.4. Days open

Days open (DO) refers the interval from calving to conception, (i.e. the number of days between parturition and the insemination that resulted in a pregnancy). According to Gebeyehu*et al*., (2007) and Tadesset*al*., (2010) a herd average of less than 85 open days indicates that cows are being breed early, 85 to 115 days considered as optimum for dairy herd, 116 to 130 indicate slight problem, 131 to 145 moderate problems, while more than 145 open days considered as sever reproductive problem in the dairy herd. Although several studies estimated DO in Ethiopia, the results are variable due to various reasons. Factors like delayed resumption of ovarian activity after calving, longer interval to first estrus and brief shorter duration of estrus along with its silent symptoms, scarcity and deterioration of available feeds, might have contributed to difficulty in heat detection and timely insemination of the cows resulting in prolonged DO (Melaku*et al.* 2011).

2.2. Productive Performance

Dairy cattle are cows breed that have the ability to produce large quantity of milk from which dairy products are made. However; those raised for dairy rarely live that long life as the average cows are removed from the dairy herd they are marked for beef. Cross breeding is an acceptable procedure for profitable live stoke production. It is widely used in the word in order to enhance production of milk and meat particularly at commercial farms. Significant heterosis value is usually obtained under optimum conditions by combing indigenous breeds and exotic breed (Belay *et al*., 2012). According to Kefena*et al.* (2006), poor productive performance indigenous cattle are originated from poor genetic potential to produce sufficient milk and poor management. So to important this, local cattle breed should be crossed with improved breeds.

2.2.1. Daily milk yield

The milk productions at different stage of lactation of cross breed dairy cows are reported by different researcher as follow. The mean milk yield was 14.3±5.4 litter, 12.7±2.7 litter, and 7.9±2.5 litters for the first, second and third stage of lactations, respectively with an overall average of 11.6±3.1 liters per day/cows in Bishoftu. The mean milk yield was 14.5±3 litter, 10.6±2.67litter, and 7.1±2.0 litters for the first, second and third stage of lactations, respectively with an overall average of 10.8±2.4 liters per day/cows in Akaki (DessalegnGenzebu*et al.*, 2016).

The mean milk yield in the urban and peri-urban areas in the different lactation stage was reported in central zone of Tigray, Northern Ethiopia was 9.0±3.9 and 9.0±4.0, 7.4±2.7 and 7.0±2.9, 4.3±1.9 and 4.4±2.3 in urban and peri-urban respectively for beginning, mid and late lactation period. The mean milk yield for local cows and their crossbred decreases from the beginning of lactation to late lactation both in the urban and peri-urban areas. The average daily milk yield (AVDMY) for the local breed cows during mid and late stage of lactation higher in urban areas than peri-urban areas. At early lactation, AVDMY for exotic breed was higher in urban areas than peri-urban areas (Gebrekidan*et al.,* 2012).

The average milk yield reported in Dabra Tabor town was 12 litter, 9.75litter, and 8 litters for the first, second and third stage of lactations, respectively with an overall average of 9.91litters per day/cows. The milk production was significantly decreased in third than first and second stage of lactation. The milk production was decreased with the advanced of lactation stage (SenaTadesse*et al.*, 2014).

Total milk production in Ethiopia increased during the 1961to 2000 period at an average annual rate of 1.55%. Additionally, during the last decade, milk production was grown at even higher rate (3.0%) (AddisuHailu*et al*., 2013). This might be as a result of increased coverage of extension services (such as better management skills) and increased use of improved inputs (improved breeds and feed) and technology and policy changes promoting dairy production (Mohamed, 2004). Similarly, Central Statiscal authority data on milk production also showed an increment to 3.33 billion liters in 2012(CSA, 2012) from2.4 billion liters in 2004 (CSA, 2004). Therefore, crossbreeding program has been contributing its impact on alleviating the ever increasing demand of milk and its product in the country.

2.2.2. Lactation length

Lactation length refers to the time of period from when a cow starts to secrete milk after parturition to the time of drying off..In most dairy farms a lactation length of 305 days is commonly accepted as a standard to take advantage of 60 days dry period. However, such a standard lactation length might not work for smallholder dairy cows where the lactation length is extended considerably in most cases (Msangi*et al*., 2005). The mean lactation length of cross breed cows in the Bishoftu and Akaki was 276.6±35.1days, 280.7±19.3 days, respectively (DessalegnGenzebu*et al.*, 2016). However, lower lactation length of cross breed cattle 7.60±1.14, 7.35±2.28, 7.86±1.72 in large, medium and small size farm respectively (Gebrekidan*et al.*, 2012).

Lactation length shows a marked difference among crosses and exotic blood levels. BoranFriesian crosses of 50% and 62.5% blood level showed numerically higher lactation length than all other exotic blood level groups ranging from 0.2-10% (AddisuHailu*et al.*, 2013). The

variability is due to the reason that the high-grade exotic breeds are more sensitive to management practices than the local and their crosses.

Table 3 Average lactation length of zebu and cross breed cows

Breeds	**Location**	**LL in days**	**Sources**
Boran	Ethiopia	211.1±7.1	Gebregziabher*et al*.,(2013)
Friesian cross Arsi	Ethiopia	306.94±3.58	Wassie*et al.,(*2014)
Friesian cross Boran	Ethiopia	307.47±3.92	Wassie *et al.,* (2014)
Begait	Ethiopia	247.11±22.64	Kumar *et al*.,(2014)
Native	Ethiopia	247.11±22.64	Kumar *et al*.,(2014)
Native cross Friesian	Ethiopia	273.9	Belay *et al*.,(2012)

2.2.3. Lactation milk yield

Lactation milk yield (LMY) is the total milk produced during a given lactation. LMY of dairy cattle may show variations from lactation to lactation in the same animal. The main reason of variation attributed to the physiology of lactation in the given set of genes and their reaction with non-genetic factors (Zewedu*et al.,* 2013). According to Belay *et al.* (2012), the mean LMY of Zebu x Friesian cattle in Ethiopia was 2042.11/cow. Similarly, Teketay*et al.* (2014), reported 1925 and 2136kg/cow for Friesian x Arsi and Friesian x Boran cross, respectively. However, The overall LSM of LMY of HF × Deoni crossbred cows was recorded as 1661.35±15.17 kg (Zewdu*et al.,* 2013). This shows that there are variations in milk yield for cross breed cattle in different production environment. This could be attributed to variation in managerial practices such as nutrition, disease control in addition to the effect of climatic conditions.

3. MATERIALS AND METHODS

3.1. Description of Study Area

The study was conducted in Wolkite university dairy farm. WolkiteUniversity is located in gurage zone of south nation nationalities and people regional state (SNNPRS),Ethiopia at 170 km south west of Addis Ababa on the way to Jimma and 12 km west of Wolkite town at latitude of about8^0 33'Latitude and 37^0 59'longitude E'. The average elevation of the area is about 1870m above sea level. The area is classified in to, woynadega agro-climatic zone.

3.2. Method of Data Collection

Both primary and secondary data was collected from secondary data sources and key informants. Secondary data was collected from Wolkite University dairy farm record keeping both milk yield and reproductive performance data like calving interval, days open and number of service per conception. For this study 14 crossbreed cows which have at least two years of records in the farm were used for data analysis. Semi – structured questionnaires and personal observation were used to collect information on the general husbandry practice like feeding system, healthcare and record keeping and also on some reproductive performance traits and milk yield to crosscheck with the recorded data**.**

3.3. Data analysis

The collected data were coded, entered and managed using Ms excel computer program (Ms Office, 2019) and SPSS.Vol.16. Descriptivestatisticslike mean, percentage were used to show the results.

3.4. Back ground information of WKU dairy farm

The Wolkite University dairy farm was established in 2015. Initially it started with four cow which perheased from Holeta agricultural research center their blood level were 75% HF crossbreed cow and at 2016were additional four introduced from Algae agricultural college. It is primary aimed for income generation, and the farm delivered milk to the University community. Additionally, it also serves as practical study for students, government extension workers and community trainings.

3.5. Herd composition of the farm

The total dairy cattle in the farm are twenty, five of them are local-Boran breed and 15 of them are cross breed ranging from 92.5% to 50% exotic blood level Additionally there are two bulls which are used for breeding purpose.

Table 4: Herd composition ofwkudairy farm

Cattle types	Local breeds	Cross breeds	Total
Bulls	NO	2	2
Lactating cows	5	14	19
Pregnant cows	NO	5	5
Dry cows	1	1	2
Young stock(>6 months to one year) of age	2	11	13
Calves up to 6 months of age	2	1	3

3.6. General husbandry practice

According to the key informants, the farm use both concentrates and roughage feed for the cow. The roughage is grass hay harvested from the local grass growing in the University compound, while the concentrate feed includes nuge seed cake, wheat bran and commercial dairy excellent feed bought from AlemaKoudis. Additionally, the cows graze around the university compound. The proportion of the feed was 50% concentrate and 50% roughages.

The feeding system also depends on milk yield per day. For lactating cow there is an additional provision of 0.5 kg concentrate feed per liter of milk yield that means if the animal were lactating

2 liter of milk per day given one kg of concentrate feed to the animal, if the animal are lactating 4 litter of milk per day given two kg of concentrate feed and if the animal were lactating 6 litter of milk per day given three kg of concentrate feed to the animal. Etc Calves in the farm were given colostrums for the first week immediately after birth. In the first three months the calves given 4.5 liters of milk per day and the fourth months were giving 3 liters per day. After one week the calves start feeding fresh grass and then when the calves start to show a good manner of feeding, 2.5% of their body weight is give per day.

4. RESULT AND DISCUSSION

4.1. Reproductive performances

4.2. Number of service per conception

Number of service per conception depends largely on the breeding system used. It is lower under uncontrolled natural breeding than hand-mating and artificial insemination (Mukasa m 1989). Number of service per conception higher than two should be considered as poor (Mukassa-Mugrewa, 1989).

The overall means NSC of the present study was found to be 1.9±.60 per cow (Table 4). The present result were disagree compared with the reported for tropical conditions of 1.3 for crossbreed cows and nearly agreement with the conception of 1.8 for crossbreed cows reported by Tadesse et, *al* (2010). Our finding also nearly agreement with the overall mean of the number of services per conception reported in Gondor by Nirajet al (2014) which was 1.8±0.3 average NSC.

Still our finding disagree with the result of 1.52 NSC reported under small holder condition in Ethiopia(Niraj et al, 2014).and managemen can affect number of service per conception that mean if the animal were properly managed the number of service decrease if not increase. In a dairy herd appropriate heat detection was essential to reduce number of service per conception the.

4.3. Days open

Days open (DO) refers the interval from calving to conception. The overall mean day open of the present study was found to be 93.07±2.444 days.(Table 4) The result were nearly agreement with Hunduma (2012) reported the overall means days open of 85.6±5.6 day for crossbreed dairy cows in Ethiopia. A herd average of less than 85 open days indicates that cows are being breed early, 85 to 115 days considered as optimum for dairy herd, 116 to 130 indicate slight problem, 131 to 145 moderate problems, while more than 145 open days considered as sever reproductive problem in the dairy herd. Therefore, the results of this study, days open between 85 to115, there for our finding were optimum for dairy herd in the farm.

4.4. Calving interval

The overall mean calving interval of the present study were found to be 400.07±3.091days (Table 4).The result of the present study agreement with 398±1.9 days reported for cross breed cattle at Bishoftu and Akaki, respectively (DessalegnGenzebu et al. 2016). The relatively longer calving interval might be indicative of poor breed. In general, both CI and DO are higher than the optimum recommended value of 365 and 90 days, respectively is not acceptable particularly in a production system in which there is a high demand for replacement young bulls and heifers to bring genetic improvement. The main reason for longer CI and DO may be poor estrus detection, poor feed quality, and poor health care generally poor managements. TABLE 5: mean and standard deviation of reproductive performance and milk yield of crossbreed dairy cows in WKU dairy farm

Traits	No of cow	Min	Max	MEAN±SD
Day open (day)	14	80	112	93.07±9.144
NSC(number)	14	1	4	1.96±.767
CI (days)	14	380	420	400.07±11.566
Lactation milk yield (lit)	14	1750	2333	1977.21±191.818
lactation length(month)	14	240	300	277.21±16.409

NSC = Number of service per conception, SD=Standard deviation

CI= Calving interval

4.5. Milk yield

4.5.1.1Daily milk yield

The mean daily milk yield of the present study were found to be 10.5±3.2litter,8.5±2 litter,5.5±1.5litter for the first, second and third stage of lactations, respectively with the overall average.8.12±.2.23litter per day/per cow(Table 6).The milk production was significantly decreased in third than first and second stage of lactation.

Table 6: show the mean and standard error of first stage, mid stage, late stage of lactation

Traits	N	Early stage (1-3 month)	Mid stage (4-6 month)	Late stage (>7 month)	Over all
DMY	14	10.5±3.2	8.5±2	5.5±1.5	8.17±.2.23

The result of the present study result were disagree withAsaminew and Eyasiu (2009) who reported that the average milk production from cross breed cows 7.3, 5.5,and 3.5 litters for first second and third stage of lactations respectively ,with an overall average daily milk production of 5.2 litters. And also our result was disagree with the result of (DessalegnGenzebu*et al.*, 2016). The mean milk yield was 14.5±3 litter, 10.6±2.67litter, and 7.1±2.0 litters for the first, second and third stage of lactations, respectively with an overall average of 10.8±2.4 liters per day/cows. And also our results were disagree with result of (SenaTadesse*et al.*, 2014).

As a rule of thumb it is recommended that average daily milk yield below 10 liter per cow for at least 50% crossbreed is not economical. There for our result average daily milk yields were poor because of the result were lower than ten litter.

4.5.2. Lactation milk yield

The mean lactation milk yield (LMY) in the present study was found to be 1977.21 litter(Table 4).The mean lactation milk yield of the present study were disagree with mean of 3710 liter for crossbreed cows in Ethiopia reported by Tadesse et al. (2010) and 2772.76 litter reported by Sattar et al. (2005). The lesser lactation length found in this study can contribute for low LMY in addition to environmental and genetics factors.

LMY of crossbreed cows in the present study may be accounted to poor husbandry practice, poor adaptation. Since poor husbandry practice can result in masking of genetic potential, through improving the management practice step by step starting from feeding, health care and housing system, production can be improved. If this doesn't improve beyond the limit, the genetic makeup of the breed can be improved through selection and crossing with higher genetic merit breeds.

4.5.3. Lactation length

The mean lactation length of cow in the present study was found to be nine month (277.21±4.386 days) (Table 4).This results were in agreement with (DessalegnGenzebu*et al.*, 2016).who reported the average location length of cross breed cow 276.6±35.1days, 280.7±19.3 days, respectively. And also the present result were disagree with wassieT
et al.,(2015)reported the average lactation length of cross breed cow 307 .47±3.92 day.

The lactation length in the present study was also lower than the optimum value of 305 days required to maintain the optimum calving interval of 12 – 13 months. In a dairy farm which is profit oriented, about 30 days less lactation length from the optimum recommended (306.94 days) can result loss of great profit. Our result was not less than 30 day, but for a better result This can be improved through a correction in management practice.

The main source of water for the farm is tape water for their farm. Water is provided free choice (adlib item) except dry season during dry season water shortage happen.

The major diseases reported in the farm were calve fever, mastitis, anemia, acidosis (heart water), Foot and mouth diseases (FMD), bloating.

4.6. Constraint and opportunities of wku dairy farm

Table 7: Show disease occurrence and their rank from 2009-2011E.C.

			Disease occurrence			Rank
NO	Disease	Affected cow	20009	2010	2011	
1	Mastitis	5	yes	yes	no	1th
2	Heart water	4	yes	yes	no	2th
3	Parasite	3	yes	yes	no	3th
4	Anemia	2	yes	yes	no	4th
5	Calve fever	1	yes	yes	yes	5th
6	FMD	2	yes	yes	no	4th

The major constraints identified in the farm during key informants interview especially by the farm manager were lack of road for the transportation of feed, poor management, disease prevalence like calve fever, mastitis, anemia, heart water (acidosis), shortage of water(mainly in dry season),shortage of veterinary service and the overall hygiene of farm (not properly cleaned). They also believe that these constraints essentially reduce the production potential and profitability of the farm.

The major opportunities for the farm identified by the respondent were high demand for milk and milk products in the areas; free access to land, inputs and technical support especially by the University lectures; access to improved breed semen; access to support by research institute. However, to benefit from these opportunities there should be coordination and good planning

4.6.1. Record keeping system

According to the key informant and our personal observation, the record keeping system is poor.

Records keeping allow the farm community to manage their farm smoothly. It improves milk, fat and protein yield, fertility of cows, decrease exposure of cows to mastitis, and for managing of animals in the farm (culling, feeding, and milk) of cows. In Wolkite \

University farm there is no quality record. They records only milk, fertility of the cow and diseases for sometimes and they live another times; there is inconsistence in recording. Still there are huge gaps of record keeping there is lack of record of feeds, feeding, management, milk fat records, milk butter records and breeding records and the recordkeeping system is not computerized.

5. CONCLUSIONAND RECOMMENDATIONS

Wolkite University dairy farm was established in 2015 with the primary aim of income generation. Currently, the farm owns 2 bulls, 20 crossbreed and 6 local Boran breed dairy cows. The study was conducted only on crossbreed dairy cows. The results of the study in WKU dairy farm revealed that the mean value of reproductive performance traits for days open, NCS and calving interval were, 93.07±2.444 day, 1.96±.160 and400.07±3.091days respectively. Based on these reproductive traits result, the farm can be said reproductively well but not enough regarding ample opportunities they have the farm.

The study also revealed that the mean lactation milk yield, daily milk yield and lactation length of crossbreed cows were 1977.21±.51.266liter, 8.12±2.23 litter and 277.21±4.39 day respectively. The milk yield of cross breed dairy cows in the farm is low compared with research results which were conducted in a similar situation. Low level of management, and poor technical support might have contributed considerably to reduce both milk yield and reproduction performance of crosses breed dairy cows in the farm. Therefore, step by step improvement in the overall management of the farm and later genetic make of the breed if the management doesn't improve production to the desired optimum level.

Although, Wolkite university dairy farm has an opportunity for the production of cross breed dairy cows, the overall reproduction performance and milk yield of crossbred dairy cows is relatively low. As a result of these the following recommendation are forwarded:

- The strategic improvement of feeding system, breeding management and good follow up is important to boost up the reproductive and milk yield.
- The farm also need further research investigation in deferent aspect of dairy production and need appropriate improvement.
- Use of improved inputs and technology to enhance production.
- The record system in the farm is not properly organized; it should be clear, well organized and computerized.

6. REFERENCES

AddisuHailu et *al.,* 2013. Cross breeding effect on milk productivity of Ethiopian indigenous cattle: Challenges and opportunities Department of Animal production and extension, University of Gondar, Gondar, Ethiopia. Vol. 3(11), pp. 515-520.

Adebabay Kebede, 2009. Characterization of Milk Production Systems, Marketing and On-affecting days open, number of service per conception and age at first calving in a herd of Alemaya University, Ethiopia

Arbel, R., Bigun, Y., Ezra, E., Sturman., H. and Hojean, D., 2001. The effect of extended calving intervals in high lactating cows on milk production and profitability. Journal of Dairy Science 84, 600–608.

Ayele ,S. 2000. Livestock production is an integral part of agricultural activities in Ethiopia and livestock contributes about 60-70% of the live hoods of the Ethiopia population.

Beever, D. E. 2006. The impact of controlled nutrition during the dry period on dairy cow

Belay Duguma, YisehakKechero and G.P.J. Janssens 2012, Productive and Reproductive performances of Zebu X Holstein-Friesian Crossbred Dairy Cows in Jimma Town,Oromia, Ethiopia,GlobalVeterinaria 8 (1): 67-72, 2012.

Berekedu ,B.Berhanu,A.Lakes,S. (2000): Indicated that inadequate feed, nutrition, widespread disease poor breeding stock, and inadequate livestock policies With respect to credit , extension, marketing and infrastructure as major constraints affecting livestock

performance in Ethiopia

CSA (Central Statistical Authority) 2012. Federal democratic republic of Ethiopia, centralstatics agency, agricultural sample survey: report of livestock anlivestock.characterstics Volume ii. March2012, Addis Ababa, Ethiopia.

CSA (Central Statistics Authority). 2009. Agricultural sample survey 2008/09. Report on live livestock and livestock characteristics. Statistical bulletin 446.
AddisAbabaEthiopia:

CSA(Central Statically Agency).,2016/17.Ethiopia Agricultural sample survey.Volll.Report on livestock and livestock and livestock characteristics. statistical Bulletin 388.CSA,

Addis Ababa, Ethiopia

CSA.CSA (Central Statistics Authority), 20014/15.Agricultural sample survey 2014/2015.Vol. II.Report on livestock and livestock characteristics.Statistical Bulletin 578. Addis Ababa, Ethiopia: CSA

Darwash, A. O., Lamming, G. E. and Wolliams, J. A. 1997.The phenotypic association between theinterval to postpartum ovulation and traditional measures ofertilityin dairy cattle. Animal Science 65: 9-16.

DessalegnGenzebu, (2016). Study of Reproductive and Production Performance of Cross Breed Dairy Cattle under Smallholders Management System in Bishoftu and AkakiTowns.Int

EmebetMoreda, 2006. Reproductive performance of dairy cows under urban dairy production

EmebetMureda and ZelekeMekuriaw, 2007. Reproductive performance of crossbred dairy cows in eastern lowlands of Ethiopia. *Livestock Research for Rural Development.Volume19,*

Ethiopia. *Ethiopian Journal Animal Production 6(2):* 37-52

Evelyn, C.G., 2001. Reproductive performance of crossbred cattle developed for milk production in the semi-arid tropics and the effect of feed supplementation. A PhD thesis submitted to University of Zimbabwe.pp165.

Farm Evaluation of the Effect of Feed Supplementation on Milk Yield and Milk Composition

farm, Ethiopia. Lives. Res. Rur. Dev., 19(7).Available at http://www.lrrd.org/lrr

Gebeyehu G., Kelay B. And Abebe B. (2007): Effect of parity, season and year on

Gebrekidan T. Weldeslasse, ZelekeMekuriawZeleke and Gangwar, S.K. 2012: Reproductive And Productive Performance Of Dairy Cattle In Central Zone Of Tigray, Northern Ethiopia.

GideyYifter., 2001. Assessment of Calf Crop Productivity and Total Herd Life of FogeraCows at Andassa Ranch in North-western Ethiopia.M.Sc. Thesis, Alemaya University. DireDawa, Ethiopia.119pp.

Haileyesus Abate, 2006. "Evaluation of Artificial Insemination Service Efficiency and

Hammond, M.H., S. Z. El-Zarkouny, E. Z. M. Oudah, 2010. Effect of sire, age at first calving,

Haramaya University; Haramaya, Ethiopia.

health, fertility and performance. Animal Reproduction Science, 96(3-4): 212-226.

Holstein-Friesian cattle. Pakistan Journal Biological Sciences, 4(6): 740–744

HundumaDinka,2012 Reproductive performance of crossbred dairy cows under smallholder condition in Ethiopia: Artificial Insemination Institute, Adama Science and Technology University.

KefenaEffa, B. P. Hegde and TesfayeKumsa. 2006. Lifetime Production and Reproduction

Lucy M C 2001 Reproductive loss in high-producing dairy cattle: where will it end Journal of

Management. Proceedings of the 11th Annual Conference of the Ethiopian Society of Animal

MoA. 2012. Livestock growth strategy and action. Draft discussion paper. Addis Ababa: MoA. (Amharic version).

Msangi, B.S.J., Bryant, M. J. and Thorne, P.J., 2005. Some factors affecting variation in

milk yield in crossbred dairy cows on smallholder farms in North-east Tanzania. *Tropical Animal Health and Production.*37: 403–412.

Mukasa-Mugerewa E (1989). A review of reproductive performance of female Bosindicus (Zebu) cattle, International Livestock Centre for Africa (ILCA), monograph, Addis Ababa, Ethiopia.

MukasaMugerwa E., 1989. A review of reproductive performance of female Bosindicus

Negussie E, Brannang,E. Banjaw, K. and Rottmann ,O .U., 1998. Reproductive perfNuraddis, Ibrahim, AshebirAbreha, ShiferawMulegeta, 2011.Assessment of reproductive of Animal Production.ESAP recommendations series No.2. Addis Ababa, Ethiopia romance

NirajKumar, AlemayehuEshetie, BerihuGebrekidan&EndaleBalchaGurmu 2014, Reproductive performance of indigenous and HF crossbred dairy cows in Gondar, Ethiopia (College of Veterinary Medicine, Mekelle University, Ethiopia) Volume 7, PP 56-61.

of Cows at Bure District, Amhara Region, Ethiopia. M.Sc. Thesis. Bahir Dar University.112

Oudah, E. Z. M.; Shalaby, N. A. and Mustafa, M. A. (2001). Genetic and non genetic factors Performances of Bostaurus x Bosindicus Crossbred Cows in the Central Highlands ofpp. Africa.Reproductive Performance of f1 Friesian Crosses" North Gonder Zone, Amhara.Thesis,ReproductiveperformancesofFogeracattleandtheirFriesiancrossesinAndas saranch,NorthwesternEthiopiahttp://www.lrrd.org/lrrd17/12/gosh17131.htm11.

SenaTadesse GueshFesaha, AdugnawAbebe, BeletechHailu and WorkalemDejen 2014 Department of Animal Science, Debre Tabor University Assessment of Productive and Reproductive Performances of Cross Breed Dairycows in Debre tabor town. Vol. 4 No

Sewalem, A.; Miglior, F.; Kistemaker, G. J.; Sullivan, P. and Van DoormaalB. J. 2008:Relationship between reproduction traits and functional longevity in Canadian dairy cattle. *J.Dairy Sci.,* 91: 1660–1668.Shiferaw Y, Tenhagn BA, Bekana M and Kassa T 2003 Reproductive performance ofcrossbred Dairy cows in different production systems in the central Highlands of Ethiopia.Tropical Animal Health and Production 25: 551-561

Tadesse M, Thiengtham J, Pinyopummin A, Prasanpanich S. Productive and reproductive performance of Holstein Friesian dairy cows in Ethiopia. Liv Res Rural Devel,22(2), 2010

Wassie T, MekuriawG.andMekuriaw Z. 2015. Milk production performances of Holstein Friesia x Arsiand Holstein Friesian x Boran cross-bredcattle at Agarfa Agricultural Technical Vocational and Educational Training (ATVET) College, Oromia, Ethiopia.Livestock Research for Rural Development.26 (154).

Zewdie W. 2010.Livestock Production Systems in Relation with Feed Availability in the high land and Central Rift Valley ofEthiopia.MSc thesis, Haramaya University, Haramaya Ethiopia

7. APPENDIX

ASSESSMENT OF REPRODUCTIVE PERFORMANCE AND MILK YEILD OF WOLKITE UNIVERSITYDAIRY FARM

QUESTIONNAIRE SERVEY FORMAT PREPARED FOR EVALUATION OF WKU DAIRY FARM

1. Tell me the short history of the farm?

_____

_____

_____

_____

Cattle composition

Type of breeds	Local breeds	Cross breeds	Total
Bulls Cows Lactations cows Pregnant cows Dry cows			

Heifers (>6 months) Calves up to 6 months of age			

2. How many work personnel's locate in farm according to educational Status?

- Doctor (veterinarians')……
- Master (in animal science)…….
- Degree (in animal science)……
- Diploma……
- Elementary…….
- Junior …….
- Secondary and above……

3.Number of total cattle in the farm: _____cross _____, local breed _____

- lactating _____
- pregnant _____
- dry _____

4. Average milk production/day:_____

- cross breed _____
- local breed _____

5. Lactation length:

- cross breed_____
- local breed-_____

Calving interval: cross breed____ ,

Local breed _____

6. Number of calving per year or this year calving cow: _____

Number of young stock

- below one year _____, M _____ & F _____
- above one year _____, M _____ & F _____

Number of breeding bulls _____

7. Average Milk yield at different stage

- First stage_____
- Second stage_____
- Third stage_____

8. With which exotic breeds your cows were cross with?

-_____

Why_____

9. Either any disease occurrences in the farm?

What are the prevention and control methods of the disease?

_____

10. how is the hygiene on the farm?_____-

---

11. Do the cow show heat with in 40 day after calving ? yes / no

Yes

why_____

nowhy _____

12. Why don't use AI service?

_____

11. why you select bull service?

_____

_____

13. What is the average calving interval and first insemination?

14. how do you detect heat ?

-_____

15. what is the age at first insemination of heifer(month)-_____

(Goal in 15 month)

16. how long is the calving interval in month ?_____goal is 12_13 month

17. What the length of day open ?-_____goal is 60_100 day

18.Daily milk production of all cow? Min_____max_____ave_____

19. Lactation length in month? min_____max _____ave_____

20. Either any incidence of abortion? Yes /no

Yes what is the cause?_____

21. What are the main sources of feed? _____

-why?_____

-_____

22. Either any water scarcity in the farm ?-_____

-_____

23. Did you come across shortage of animal feed? 1. Yes 2. No

If yes, Can you mention at what months feed shortages exist?

1_____

_____

24. To provide first milk for calve if yes how much liter per day?

25. Whether or not the farm gate the expected result(out put)yes/ no

If you say no, what major constraint in the farm that is limit the productive and reproductive performance (list down?)

_____

26. Do you have separation house of the farm from dam and calve? yes /no

Why_____