

Research Article

Assessment of Major Reproductive Health Problems of Dairy Cows in Dairy Farms of Wolaita Sodo District, Southern Ethiopia

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• Dairy Cow; Dairy Farms; Reproductive Health Problem; Wolaita Sodo Town

Abstract

A cross-sectional questionnaire-based study was conducted in 103 dairy farms to identify the major reproductive health problems of dairy cattle in Wolaita Sodo district. The dairy farm owners were interviewed with their own languages and data on dairy reproductive performances, particularly the history of reproductive health problems, were collected. The current finding revealed that the most frequently recorded reproductive health problems were repeat breeding (85.55%), retained fetal membrane (23.3%), anestrus (17.47%), dystocia (12.6%), abortion (10.67%), uterine (6.79%) and vaginal prolapse (3.88%), and pyometra (1.94%). Overall, 55% (57/103) of the farm owners responded that their dairy cows were affected by either one or more of the above reproductive health disorders. In the present study, there was a significant association ($p < 0.05$) between the educational levels of dairy farm owners and the feeding frequency as well as the health management system of dairy farms. Whereas there was no significant association ($p > 0.05$) between work experience and farm management practice as well as health management. Thus, repeat breeding was the most common reproductive health problem recorded in the study area that has an impact on the reproductive health of dairy cows. Further studies should be conducted at different blood levels, and awareness is given to farm owners and attendants to improve dairy management with increased parity.

INTRODUCTION

Ethiopia is one of sub-Saharan Africa with a large potential for livestock production. The country is first among African countries and the 9th in the world [1]. The livestock sector has been contributing a significant portion to the economy of the country and is still promising to contribute to the economic development of the country. The Ethiopian total cattle population was estimated to be about 56.71 million. Out of this, female cattle constitute about 55.45, and 98.66% of the total cattle in the country are local breeds and the remaining are crossbreed and exotic breeds that accounted for about 1.19 and 0.14%, respectively [2].

The overall cost of keeping cattle in terms of costs associated with health care, nutrition, and reproduction management, however, has not matched their contribution to the living and the economy of the people in the region. As in many countries, livestock, particularly cattle play multiple roles in Ethiopia being a source of milk, meat, hide, etc. First smallholder dairy households keep the majority of the cattle in Ethiopia accounting for 97% of all milk produced and 75% of commercial milk production. Secondly, state farms that have been privatized or are in the process of privatization are using high-grade animals. The third groups are peri-urban and urban households, mainly keeping crossbreed animals [3].

The reproductive problem is the inability of the female or male to reproduce. Insidious but great losses are directly due to

failure to breed on the part of otherwise promising animals. This loss is made up by the keep of the barren animals that absence of offspring, reduction of milk supply, and interferences with breeding programs [4]. However, the productivity of indigenous cattle breeds is low due to many constraints including infectious diseases, nutrition, poor management systems, poor reproductive performance, and large socioeconomic factors by decreasing reproductive efficiency, shortening the expected length of productive life, and lowering milk production. Reproductive problems are the most common which occur in lactating dairy cows and can dramatically affect the reproductive potential of the dairy herd. Poor reproductive performance is a major cause of involuntary culling and therefore reduces the opportunity for voluntary culling and has a negative influence on the subsequent productivity of a dairy herd [5,6].

It has been indicated that reproductive health disorders result in considerable economic losses to the dairy industry and are the main causes of poor productive performance of dairy farms. Accordingly, upon closer examination of reproductive processes in the dairy cattle, the post-partum period is the most varied and vulnerable to problems and that incidentally coincides with the peak of milk production, uterine involution, and resumption of ovarian activity, conception and greater risk to infection [7-9].

Among the major problems that have a direct impact on the reproductive performance of dairy cows, retained fetal membrane, and the subsequent endometritis and pyometra

have been reported to be the most common clinical and economic problems. These have been implicated to cause a considerable economic loss to the dairy industry due to slower uterine involution, reduced reproductive rate, prolonged inter-conception period and calving interval, high cost of medication, drop in milk production, reduced calf crop and early depreciation of potentially useful cows [10,11].

Moreover, the dairy industry needs a successful reproductive goal that including 12 months of calving interval, 85 days open, 1.6 services per conception rate, and 85% of cows observed in estrus and recorded by 60 days fresh. Also, it is very difficult to diagnose those problems by one particular disorder or symptom because there is an interrelation between predisposing factors such as management at calving, hygiene, and parity, stage of gestation, nutrition and environment [12,13]

Dairy production is the most important and growing sector in and around Wolaita Sodo town, where dairy cows and their products are the main sources of income and food. The zone is among the highly populated area in the Southern Nations, Nationalities, and People's Region (SNNPR). Thus, the demand for dairy and dairy products is increasing recently. However, reproductive health problems remain the main bottleneck for their productivity [11,14]. Besides, the perusal of different literature revealed that there is a paucity of researches regarding the major reproductive health problems in and around Wolaita Sodo town. Therefore, the present investigation had been planned to assess the prevalence of major reproductive health problems of dairy cattle and possible risk factors that play a role in precipitating such problems in dairy farms of the Wolaita Sodo town.

MATERIAL AND METHODS

Study Area

The study was conducted on dairy farms of Wolaita Sodo Town. Wolaita Sodo is the capital city of Wolaita zone that is situated 390 Km South of Addis Ababa. It is situated at the latitude of 8°50'N and longitude of 37°45'E with an altitude of 2025 meters above sea level. The study area has a mean annual temperature of 20°C (minimum of 15.1°C to a maximum of 31°C) and receives Maximum rainfall of 801-1,600 mm from July to September [14]. The areas are selected because of the presence of high potential of livestock in the area [15] (Table 1).

Study Animals

The study animals were dairy cows of different parity, age group, body condition, management, lactating pregnant, lactating non-pregnant, dry pregnant, and dry non-pregnant dairy cows were included during this questionnaire survey. Besides, pregnant cows at any trimester stage were purposively selected for regular follow up during the study period. The study cattle were of both local and crossbreed cattle. Classification of farm management systems was performed according to the criteria adopted by Richard [27].

Study Design

A cross-sectional study design was employed using both questionnaires and observational studies to assess the major

Table 1: The number of livestock population in Wolaita Sodo district.

Cattle	Sheep	Goat	Donkey	Poultry	Total
31,147	3,840	1,356	2,369	25,251	63,963

reproductive health problems in the dairy farms of Wolaita Sodo district. The dairy farms were purposively selected based on their accessibility, willingness of owners, and existing dairy potential in line with the zonal dairy estrus synchronization program. Household's data list who own dairy cattle were collected from the kebeles administrative office, and individual owners were interviewed to generate data on the general farm conditions, cow attributes (age, parity, and breed), information on breeding, and AI and other related problems.

Sample Size and Sampling Technique

The current study comprised of systematically and randomly selected dairy cow owners that are found in Sodo town and its surroundings. Thus, the required sample size for this study was estimated by considering the formula given by Arsham [16] for the questionnaire survey.

$$N = 0.25/SE^2$$

where, N = sample size; SE = Standard error.

Accordingly, a standard error of 5% and a 95% confidence interval was considered to calculate the required sample size. Hence, the sample size was calculated to be 100 and a total of 103 dairy farm owners were interviewed for this study.

Study Methodology

A structured questionnaire was prepared to assess the knowledge, attitude, and practice of the community settled on urban and peri-urban areas of Wolaita Sodo town. The questionnaire was properly translated to the local language 'Wolaitgna' and 'Amarigna' during the interview. Besides, they were briefed about the objective of the survey and asked for their consent before the interview was commenced.

Method of Data Collection

A questionnaire was presented to each systematically and purposively selected individual dairy cow owners. The questionnaire includes two main headings. The first main heading includes information on Socio-demographic status of the study population. The second heading includes specific questions related to reproductive health problems and performance (Annex 1). The questionnaire was carried out by interviewing individuals about their Socio-demographic characteristics followed by specific questions related to reproductive health problems and associated risk factors in the area.

Data Management and Statistical Analysis

The questionnaire data were entered and coded into the Microsoft Excel 2016 spreadsheet application program and imported to STATA version-13 statistical software for descriptive statistical analysis, hypothesis testing, and test of association between different risk factors and outcome variables. Pearson's Chi-square test was used to detect the existence of an association between variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Socio-demographic Description of the Respondents

According to the current survey, the majority of the respondents were females (61.2%) compared to males (38.8%) with different educational backgrounds and work experiences in the respective assessed dairy farms. The working experience of respondents also indicated that 34.9% of them have more than 10 years of working experience on dairy farms ranging from. According to their educational background of the respondents, 32.4% of the respondents have completed elementary and high school education. Whereas the majority (44.1%) of the dairy farms were small scale dairy farms followed by medium-scale (31.06%), and large scale (25.24%) (Figure 1).

Description of Farms and their management system

The current study showed that the majority (80.58%) of visited dairy farms were private-owned, followed by corporately owned (15.53%), and governmental farms (3.88%). Also, 65.05% of the study farms kept their dairy cattle under semi-intensive management system and 75.73% of them use an open-air housing system. Furthermore, most dairy farms were found to keep only female dairy cattle (64.08%) while the rest kept both female and male dairy cattle (35.92%). Likewise, 91.26% of the study farms have kept adult dairy cows only (Table 2).

As indicated in table 3, the majority of the dairy farm owners (93.20%) have kept exotic breed dairy cattle and AI was commonly practiced as a breeding system by most of the respondents (80.58%) followed by natural mating (4.85%). Furthermore, most farm owners (95.15%) provide a mixed type of feed for their dairy cattle. Besides, most farms (45.63%) feed their dairy cattle twice a day.

Prevalence of Major Reproductive Health Problems

The current assessment revealed that 55% (57/103) of the farm owners responded that their cows were affected by either one or more of their productive health problems. Among these, repeat breeder (85.55%), retained fetal membrane (23.3%),

anestrous (17.47%), dystocia (12.6%), abortion (10.67%), uterine (6.79%) and vaginal prolapse (3.88%), and pyometra (1.94%) were the most commonly encountered reproductive health problems in the dairy cows during the study period (Figure 2).

Major Farm Challenges

According to the current study, different constraints were observed and reported by the dairy owners. Among these, lack of proper farm management (71.8%) was found to be the major challenge reported and observed followed by lack of market opportunity (10.7%), feed shortage and lack of fodder (9.7%) (Table 4).

Knowledge and Practice of Farm Owners on Farm Management Practices

The current assessment revealed that most (39.4%) of the respondents that have 5-10 years of farm experience prefer to call for veterinary consultancy when there were different reproductive health disorders. However, there was no statistically ($p=0.669$) significant association between the farm experience and health management system. The majority of the respondents (44.12%) having 5-10 years of farm experiences kept their dairy cows under intensive management system and there was no significant ($p=0.212$) association between the farm experience and the management system.

Moreover, most farms (40.63%) having 5-10 years of experience provide mixed (roughage and concentrate) type of feed and most of them feed their dairy cows twice per day. As shown in Table 5, there was no statistically significant difference ($P>0.05$) between farm experience and feed type as well as feeding frequency.

As indicated in Table 6, most dairy farm owners who have elementary and high school educational background prefer to call for veterinary service when there were different health disorders. Besides, the result shows a significant association ($P=0.026$) of the health management system religion with educational background. Likewise, the educational status of the

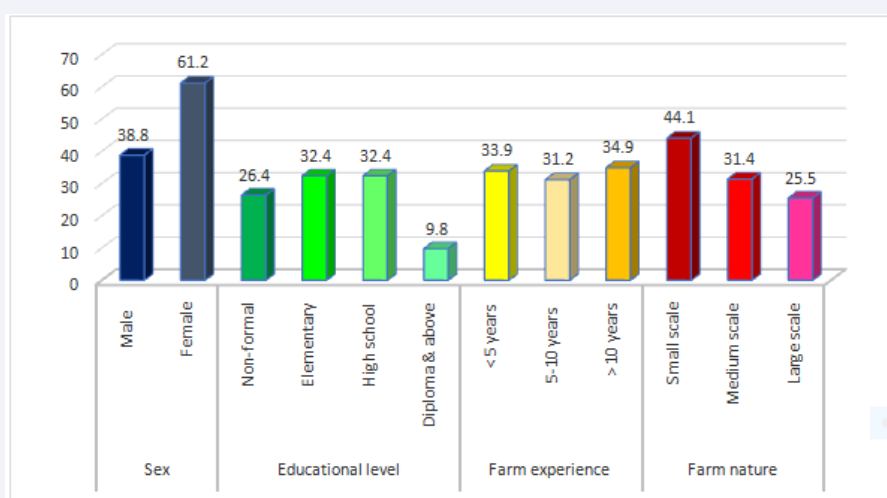


Figure 1 Socio-demographic descriptions of the respondents in the dairy farms.

Table 2: Characteristic descriptions of the study dairy farms.

Variables	Category	Frequency (N)	Percentage (%)
Management system	Intensive	36	34.95
	Semi-intensive	67	65.05
Farm owner	Private	83	80.58
	Government	4	3.88
	Cooperate	16	15.53
Farm housing type	Open-air	78	75.73
	Confined/closed	23	22.33
	Both	2	1.94
Sex of animals kept	Females only	66	64.08
	Female and Male	37	35.92
Age group of animals kept	Young and adults	9	8.74
	Adults only	94	91.26

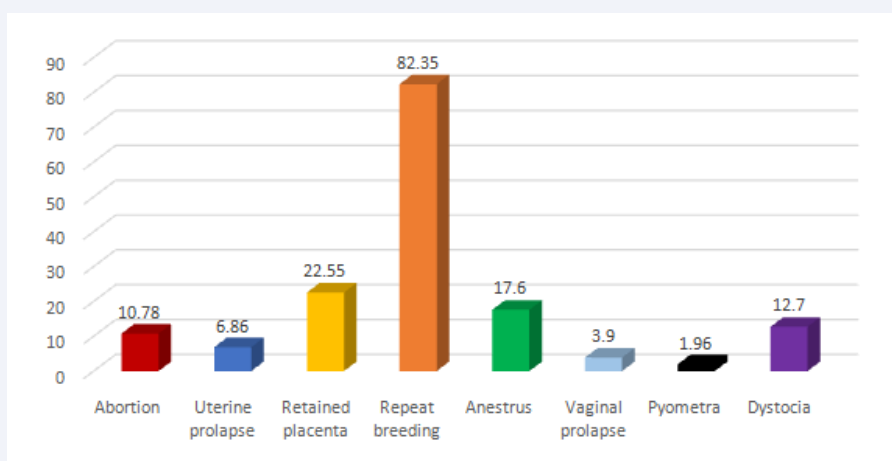


Figure 2 Prevalence of major reproductive health disorders reported in the study farms.

Table 3: Reproductive health management systems of the dairy farms.

Variable	Category	Frequency (N)	Percentage (%)
Breed type	Local	1	0.97
	Exotic	96	93.20
	Cross	6	5.83
Breeding system	Natural	5	4.85
	AI	83	80.58
	Both	15	14.56
Feed type	Concentrate	1	0.97
	Roughage	4	3.88
	Mixed	98	95.15
Feeding frequency	Ad-libitum	25	24.27
	Once	5	4.85
	Twice	47	45.63
	Trice	26	25.24

respondents found to be statistically significantly associated ($P < 0.05$) with feeding frequency and elementary school (1-8) level had higher knowledge (46.81%) that provides feed three times per day (Table 6).

Moreover, intensive management systems were commonly practiced among the illiterate one level (36.11%) whereas the respondent under the elementary level managed their dairy cows using a semi-intensive management system (35.82%). A mixed type of feed (roughage and concentrate) was preferred by elementary and high school (32.65%) over the other types of feed. The management system and feed type had no statistically significant association ($P > 0.05$) with the educational level status of the dairy owners.

Table 4: Major challenges observed and reported in dairy farms.

Type of constraint	Frequency (N)	Percentage (%)
Feed shortage	10	9.7
Lack of fodder around the year	10	9.7
High costs of feed	6	5.8
Farm management problem	74	71.8
Disease	4	3.9
Financial problem	2	1.9
Market problems	11	10.7

Table 5: Association of farm management practices against farm experience of respondents.

Variable	Category	Farm Experience (years), N (%)			X ²	p-value
		< 5	5-10	> 10		
Health management	Vet. Consultancy	29 (29.3)	39 (39.4)	31 (31.3)	2.37	0.669
	Deworming only	0 (0)	1 (50)	1 (50)		
	No follow-up	0 (0)	1 (100)	0 (0)		
Management system	Intensive	15 (22.06)	30 (44.12)	23 (33.82)	5.84	0.212
	Semi-intensive	13 (39.4)	11 (33.3)	9 (27.3)		
	Extensive	1 (100)	0 (0)	0 (0)		
Feed type	Roughage	3 (50)	2 (33.3)	1 (16.7)	1.56	0.459
	Mixed	26 (27.08)	39 (40.63)	31 (32.29)		
Feeding frequency/day	Once	1(20)	3 (60)	1 (20)	5.02	0.542
	Twice	17 (27.87)	25 (40.98)	19 (31.15)		
	Thrice	3 (16.67)	7 (38.89)	8 (44.44)		
	Daily	8 (44.44)	6 (33.33)	4 (22.22)		

Table 6: Awareness of farm owners regarding farm management practices.

Variable	Category	Educational Level, N (%)				X ²	P-value
		Illiterate	Elementary (1-8)	High school	Diploma		
Health management	Vet. Consultancy	27 (27)	33(33)	32(32)	8(8)	14.36	0.026
	Deworming	0(0)	0(0)	1(50)	1(50)		
	No follow-up	0(0)	0(0)	0(0)	1(100)		
Management system	Intensive	13(36.11)	9(25)	10(27.78)	4(11.11)	3.35	0.341
	Semi-intensive	14(20.90)	24(35.82)	23(34.33)	6(8.96)		
	Extensive	0(0)	0(0)	0(0)	0(0)		
Feed type	Roughage	1(100)	0(0)	0(0)	0(0)	4.35	0.630
	Concentrate	2(50)	1(25)	1(25)	0(0)		
	Mixed	24(24.49)	32(32.65)	32(32.65)	10(10.20)		
Feeding frequency per day	Once	11(44.00)	5(20)	8(32)	1(4)	17.97	0.036
	Twice	1(20)	0(0)	2(40)	2(40)		
	Thrice	9(19.15)	22(46.81)	12(25.53)	4(8.51)		
	Daily	6(23.08)	6(23.08)	11(42.31)	3(11.54)		

Status of Vaccination in the Dairy Farms

In this study, different types of vaccines were used in dairy farms against various types of viral and bacterial diseases. Accordingly, Blackleg (40.77%) vaccine was the most frequently used vaccine in dairy farms. Besides, Bovine pasteurellosis vaccines (18.44%), Lumpy skin disease vaccines (15.33), and Contagious Bovine Pleuropneumonia vaccines (8.7%) were also used within the dairy farms (Table 7).

DISCUSSION

In the current study, the majority of visited dairy farms were (80.58%) private owned, (15.53%) cooperative, and (3.88%) government-owned with the majority of them were having open-air housing system (75.73%). According to Dewier, [17], animals kept in non-confined open-air houses can easily express their natural physiological behaviors and their welfare being considered too which will have a positive effect on their overall productivity.

With respect to the dairy farm type/scale, the majority of the study farms (43.69%) were small scale dairy farms with less than 5 heads of dairy cows, followed by (74.76%) medium scale with 5-10 heads, and the rest have more than 10 heads regarded as large-scale farms. This finding was in line with the previous findings of ILRI, [18] that states small scale (<5), medium-scale (5-10), and large scale (>10) heads of dairy cows, respectively.

Therefore, the educational levels of dairy farm owners and work experience have an impact on the reproductive health problems of dairy cows. However, this finding is not in line with the report of Daniel, [19] who has documented that only 12% of respondents enrolled in primary schools and 2.7% attend secondary school. This difference seems to arise from the differences in awareness and access to education. The majority of observed dairy farms (89.22%) rear both young and adults' dairy cows in their farms. Similarly, Felleke and Geda, [20] have stated that young cows or heifers need to be raised in a dairy farm investment as replacement stock for the future sustainability of the farm.

Table 7: Vaccination types, dosage, route, time/season, and frequency.

Vaccine type	Dosage	Route	Season	Regularity	Frequency (%)
Anthrax	1ml	S/c**	September to October	Yearly	3(2.9)
Blackleg	2ml	S/c	September to October	Twice a year	42(40.77)
LSD	1ml	S/c	January	Yearly	16(15.53)
CBPP	1ml	S/c	January	Yearly	9(8.7)
BPs	2ml	S/c	November	Yearly	19(18.44)
LSD and Blackleg	-	S/c	-	Twice & Yearly	5(4.85)
All type*	-	S/c	-	Yearly	3(2.9)

*All type of vaccine includes Anthrax, Blackleg, Lumpy skin disease (LSD), Contagious Bovine Pleuropneumonia (CBPP), and Bovine pasteurellosis vaccines (BPs)

**S/c=subcutaneous

Furthermore, results have also indicated that most of the dairy farm respondents manage the health status of their dairy cattle through regular veterinary consultancy (97.06%) and deworming (1.96 %). In agreement with this finding, Abebe, [21] has stated that animal health management through veterinary consultancy and deworming are important in increasing the productivity of animals in a generally good performance.

According to the current study, the majority (95.15%) of the dairy farm respondents provide a mixed type of feed and 3.88% roughage feeds. Similarly, Solomon, [22] has also reported that animals cannot be expected to produce at their greatest potential unless they are properly fed with a balanced ration of protein, carbohydrate, fats, minerals, vitamins, and water. Moreover, dairy farm owners should use the recommended standards, feed composition tables, and also must understand the dairy animal's requirement for maintenance and production to properly design a balanced ration [23,24].

According to the present study, 55.3% (n=57/103) herd level history of reproductive health problems were recorded. This finding was comparable with the finding of Miseboet *et al.*, [25] who reported 52% in Boloso Sore. However, the current finding was higher than the report of Wagari and Shiferaw, [26], 39.5%, Molalegne and Shiv, [27], 24.8% as well as Wujira and Nibret, [11], Kifle and Moges, [28] and Gashaw *et al.*, [29] who reported 35.5, 29 and 33.59% in and around Horro Guduru Wollega, Bedelle zone, Wolaita Sodo, Jimma, and Gondar town respectively. The differences might be due to differences in sample size, dairy management, and agroecology of the study sites. In the present study, repeat breeder syndromes, dystocia, abortion, RFM, and uterine prolapse were found to be the major reproductive health problem identified in the area. There was a higher occurrence for the Repeated Breeding Syndrome (RBS) (85.55%). This was much higher than previous reports of Miseboet *et al.*, [25], 17% in Boloso Sore; Benti and Zewdie, [30], 10.3 % in and around Borana Oromia, and Haile *et al.*, 2014 [13], 13.08% in Hosanna town. Repeated breeding can be caused by several factors, including sub-fertile bulls, endocrine imbalance, malnutrition, reproductive tract infections, and poor management practices such as wrong time of insemination or faulty heat detection, inappropriate semen handling and insemination techniques [31].

The prevalence of dystocia obtained in this study (12.6%) was higher than the report by Getachew and Nibret, [32] that is

3.3% and Haile *et al.*, [13] who reported 5.9%. This variation in the occurrence of dystocia might be associated with multifactorial factors such as nutritional status, age, and parity as well as the breed of the sire and size of the dam. Besides, small-sized breeds of cows inseminated with the semen collected from larger sized bulls could be an important cause of dystocia.

The occurrence of abortion in this study was 10.67%, which lower than the previous reports of Kifle and Moges, [28] who reported 19.7% in and around Gondar town, Miseboet *et al.*, [25], who reported 14.5% in Boloso Sore, and Haile *et al.*, [13] who reported 13.08% in and around Hosanna town. Besides, this study shows that abortion in dairy cattle was found to be more common in pluriparous cows at the advanced pregnancy stage.

The record for Retained Fetal Membrane (RFM) (23.3%) was higher than the report of Ayana and Gudeta, [33] that was 8.3% in selected sites of the central zone of the Tigray region and Haile *et al.*, [13] that was 7.18% in Hosanna town and Miseboet *et al.*, [25], that was 5.5% in Boloso Sore. The incidence of RFM might be linked to the incidence of abortion that is a known predisposing factor for RFM. Other factors such as year of calving, the season of calving, parity of dam, calving difficulty, and fetal presentation have all been shown to affect the incidence of RFM [31].

The prevalence of anestrous reported in this study was 18.47% and this was comparable with the previous reports of Hadushet *et al.*, [34] 12.9% in dairy cattle in Debre Zeit and Haile *et al.*, [13] who reported 12.26% in urban and Peri-urban area of Hosanna. Moreover, the finding of the current study is higher than the results reported by Wujira and Nibret, [11] 4.8% and Tigabnehet *et al.*, [1], 5.3%, Molalegne and Shiv, [27] 1.7%, and Ebrahim, [35] 0.7%. The variation in the prevalence of anestrous might be due to age, inappropriate heat detection, breed, nutritional status, poor body condition, and management system.

According to the present study, the occurrence of vaginal and uterine prolapse was 3.88% and 6.7%, respectively. This finding was higher than the previous report of Molalegne and Shiv, [27] who reported 0.66% vaginal prolapse and 0.76% uterine prolapses. Moreover, the current finding of vaginal prolapse was comparable with the report of Wagari and Shiferaw, [26] who reported that 1.73% with uterine prolapse and 0.5% of the cases were vaginal prolapse. The possible factor may attribute to forced traction of fetuses at parturition, breed of animal, puerperal disease, and nutritional deficiency.

In the present study, pyometra was the other important reproductive abnormality with the prevalence of 1.94%. This finding is in line with the finding of Simenewet *al.*, [36] who reported the prevalence rate of 1.6% at Sululta slaughterhouse in Ethiopia. However, this finding was lower than the finding of Dabaleet *al.*, [37] in Hawassa city who reported 2.76%. The differences could be attributed to microbial infections, management, and animal age.

CONCLUSION

This study revealed that reproductive health problems particularly of repeat breeder syndrome retained fetal membrane, anestrus, dystocia, abortion, pyometra, vaginal and uterine prolapsed were the found the most common problems of dairy cows in the study area whereas, lack of proper farm management, lack of market opportunity, feed shortage and lack of fodder was found to be the major challenge seen in the farms. Also, this study indicates that the association of farm management system and feeding frequency showed a significant difference with respect to the awareness level of the owners on different reproductive health problems. Many smallholders' farms are run as a sideline business and are often victimized with improper management thus; putative risk factors responsible for the occurrence of reproductive health problems were breed and service type.

In conclusion, further studies should be conducted at different crossbreed levels, and awareness should be created to farm owners and attendants to improve dairy management with increased parity. Furthermore, improving management like herd health care, heat detection and proper selection of bulls for breeding should be practiced to minimize the problems and hence increase the reproductive efficiency of dairy cows in the area.

REFERENCES

1. Tigabneh A, Fantahun S, Bihonegn T, Tesfaye W. Assessment of major reproductive disorders of dairy cattle in Dessie and Kombolcha towns, South Wollo, North-Eastern Ethiopia. *Int J Adv Res Biol Sci.* 2017; 4: 89-96.
2. Central Statistical Agency. Report on livestock and livestock characteristics. The Federal Democratic Republic of Ethiopia, Private Peasant Holdings, Statistical Bulletin 570. Addis Ababa, Ethiopia: CSA; 2015.
3. Dinka H. Major reproductive disorders of dairy cows in and around Asella town, Central Ethiopia. *Journal of Veterinary Medicine and Animal Health.* 2013; 5: 113-117.
4. Ayisheshim A, Abegaz S, Mohammed A. Study on the Major Dairy Cows Reproductive Problems in and Around Gondar Town, Northwest Ethiopia. *J Vet Sci Technol.* 2017; 8: 484.
5. Hossein-Zadeh NG. Effects of main reproductive and health problems on the performance of dairy cows: a review. *Spanish Journal of Agricultural Research.* 2013: 718-735.
6. Tegegne A. Reproductive development and function in Zebu and crossbred cattle in Ethiopia: James Cook University of North Queensland. 1989.
7. Radostits O, Gay C, Hinchcliff K, Constable P, Jacobs D, Ikede B. *Veterinary medicine: A textbook of the diseases of cattle, sheep, pigs, goats, and horses.* London: Saunders. 2007.
8. Fesseha H. Clinical and Sub-Clinical Endometritis and its Impact in Reproductive Performance of Cattle: A Review. *Corpus J Vet Dairy Sci.* 2020; 1: 1005.
9. Fesseha H, Negash G, Gebrekidan B. Caesarean operation in cow due to prolonged pregnancy. *Vet Med Open J.* 2019; 4: 95-9.
10. Gizaw Y, Bekana M, Abayneh T. Major reproductive health problems in smallholder dairy production in and around Nazareth town, Central Ethiopia. *Priory Medical Journal Online.* 2007.
11. Wujira E, Nibret M. Major Reproductive Health Problems in Dairy Cows in Wolaita Sodo Town in Selected Farms. *European Journal of Biological Science.* 2016; 8: 85-90.
12. Getachew Y, Lemma A, Fesseha H. Assessment on reproductive performance of crossbred dairy cows selected as recipient for embryo transfer in urban setup Bishoftu, Central Ethiopia. *Int J Vet Sci Res.* 2020; 6: 80-86.
13. Haile A, Tsegaye Y, Tesfaye N. Assessment of major reproductive disorders of dairy cattle in urban and per urban area of Hosanna, Southern Ethiopia. *Animal and Veterinary Sciences.* 2014; 2: 135-141.
14. Asrat A, Feleke A, Ermias B. Characterization of Dairy cattle production systems in and around Wolaita Zone Sodo Town, Southern Ethiopia. *Scholarly journal of Agricultural Science.* 2016; 6: 62-70.
15. WZFEDD. Wolaita Zone Financial and Economic Development Department. Zonal Basic Socio-economic and Demographic Information. Nov, 2011. Wolaita Sodo. 2020.
16. Arsham H. Questionnaire design and survey sampling. 2005; 14: 2008.
17. Dewier JL. The speech-language pathologist's role in the Neonatal Intensive Care Unit. *Research Papers.* 2012; 40: 16-19.
18. ILRI. International Livestock Research Institute (ILRI) annual report of markets that work making a living from livestock. Nairobi, Kenya. 2007.
19. Daniel T. Beef and dairy cattle Production animals System and Opportunity for Market Orientation in Borana zone, Southern Ethiopia [MSc Thesis]. 2008.
20. Felleke G, Geda G. The Ethiopian dairy development policy: A draft policy document. Ministry of Agriculture/AFRDRD/AFRDT Food and Agriculture Organization/SSFF Addis Ababa, Ethiopia. 2001; 9: 333-342.
21. Abebe D, editor the role of medical plants in health care coverage of Ethiopia, the possible integration. Conservation and sustainable use of medicinal plants in Ethiopia, Proceeding of The National workshop on Biodiversity and sustainable use of medicinal plants in Ethiopia. 2001.
22. Solomon B. Assessment of Livestock Production Systems and Feed Resource Base in Sinana Dinsho District of Bale Highlands, Southeast Oromia: M. Sc. Thesis presented to the school of graduate studies of Alemaya. 2004.
23. Perry TW. Breeding herd nutrition and management. *Beef Cattle Feeding and Nutrition: Elsevier;* 1995. 169-197.
24. Farah AA. Assessment of Major Constraints of Dairy Cattle and Its Associated Risk Factors in Mekelle City, Ethiopia. *Global Veterinaria.* 2018; 20: 225-238.
25. Misebo F, Gashaw T, Yilma M. Assessment on major reproductive health problems of dairy cattle in Boloso Sore, Southern Ethiopia. *Journal of Veterinary Medicine and Animal Health.* 2018; 10: 224-230.
26. Wagari A, Shiferaw J. Major reproductive health problems of dairy cows at Horro Guduru animal breeding and research center, Horro Guduru Wollega Zone, Ethiopia. *International Journal of Biochemistry,*

- Biophysics & Molecular Biology. 2016; 1: 18-24.
27. Molalegne B, Shiv P. Study on major reproductive health problems in indigenous and cross breed cows in and around Bedelle, South West Ethiopia. *Journal of Animal and Veterinary Advances*. 2011; 10: 723-727.
28. Kifle M, Moges N. Major Reproductive Health Disorders of Cow in and Around Gondar, North West Ethiopia. *Journal of Reproduction and Infertility*. 2016; 7: 88-93.
29. Gashaw A, Worku F, Mulugeta S. Assessment of Small Holder Dairy Production System and Their Reproductive Health Problems in Jimma Town, Southwestern Ethiopia. *Intern J Appl Res vet Med*. 2011; 9.
30. Benti AD, Zewdie W. Major reproductive health problems of indigenous Borena cows in Ethiopia. *J Adv Vet Anim Res*. 2014; 1: 182-188.
31. Arthur G, Noakes D, Parkinson T, England G. *Arthur's Veterinary Reproduction and Obstetrics*. Philadelphia: WB Saunders Ltd. 2001. 864.
32. Getachew E, Nibret M. Major reproductive health disorders in cross breed dairy cows in Ada'a district, East Shoa, Ethiopia. *Global Veterinaria*. 2014; 13: 444-449.
33. Ayana T, Gudeta T. Incidence of Major Clinical Reproductive Health Problems of Dairy Cows at Bako Livestock Research Farm over Two-Year Period (September 2008-December 2010). *Animal and Veterinary Sciences*. 2015; 3: 158-165.
34. Hadush A, Abdella A, Regassa F. Major prepartum and postpartum reproductive problems of dairy cattle in Central Ethiopia. *J Vet Med Anim Health*. 2013; 5: 118-123.
35. Ebrahim O. Study on major reproductive health problems of small-holder dairy farms in and around Kombolcha. Unpublished DVM Thesis, Addis Ababa University. 2003.
36. Simenew K, Bekana M, Fikre L, Tilahun Z, Wonda M. Major gross reproductive tract abnormalities in female cattle slaughtered at Sululta slaughterhouse in Ethiopia. *Medicina Veterinaria*. 2011; 6: 506-513.
37. Dabale SA, Kerorsa GB, Ahmed WM. Prevalence of Major Reproductive Disorders of Dairy Cows in Hawassa City, Ethiopia. *Journal of Reproduction and Infertility*. 2020; 11: 08-13.

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