Prevalence of Major Reproductive Health Problems in Cows
(Studied in West Belessa Wereda Veterinary Clinic)

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Abstract: A cross sectional study was conducted in West Belessa Wereda Veterinary Clinic from November, 2018 to March, 2019 with the objectives of investigating the prevalence of major reproductive health problems in cows. Animals which were brought to the clinic as a case with different abnormalities were diagnosed and reproductive health problems were identified and recorded. The study was carried out on a total of 384 local and cross breed cows. From these 384 diagnosed animals, 45 cows with an overall prevalence of 11.7% were found with reproductive health problems. The major reproductive health problems identified in the present study were dystocia, abortion, retained placenta, uterine prolapsed and vaginal prolapsed with the prevalence of 2.6%, 2.1%, and 5.2%, 1.3% and 0.5% respectively. Age, management system, body mass condition and types of breed were taken as risk factors in order to assess their significance relation with the problems. From these risk factors, Age, management system and body mass condition with their p-value (.000, .026 & .000) respectively were statistically significant while animals’ breed (local and cross breed with jersey) were not significantly associated (p>0.05). The prevalence of major reproductive health problems for age was 20% and 6.6% respectively for age 2-4 years and >4 years. Cows’ management systems were found 12.3% and 9.7% prevalence for extensive and semi intensive management systems. Poor body mass condition cows were more exposed to reproductive health problems than good and medium body mass condition with their respective prevalence of 15.5%, 10.7% and 7.6%. The prevalence for local and cross breed (local breed cross with jersey) was found 12.3% and 7.7% respectively. In conclusion, reproductive health problems are one of the major reasons for decreased reproductive efficiency in cattle. Therefore further detailed studies on the major reproductive health disorders and disease control & prevention methods should be applied in the area.

Keywords: Cow, Reproductive health problems, Prevalence, Risk factor & Breed.
1. INTRODUCTION
Ethiopia is believed to have the largest livestock population in Africa. The country’s total cattle population is estimated to be about 56.71 million. Out of this cattle population, the female cattle constitutes about 55.45% and 98.66% of them are local breeds while hybrid and exotic breeds account 1.19% and 0.14% respectively [1]. The livestock contributes about 16% of national GDP and 35.6% of agricultural GDP. It also contributes about 15% of export earnings and 30% of agricultural employment [2]. The sector also plays a vital role as a source of food income, services and foreign exchange to the country’s economy [3]. Even though the country has this large numbers of cattle population, the productivity is very low due to the constraints of disease, nutrition, poor management which in turn result in poor reproductive performance of cattle [4]. Reproductive disorders are one of the major reasons for decreased reproductive efficiency in cattle and consequently reproductive efficiency is the major determinant of lifetime productivity of cows [5]. They result in heavy economic losses and have been public health concern. They are also the main causes of poor productive performance in smallholder dairy farms [6].

Among the major reproductive problems that have direct impact on reproductive performance of cows in West Belessa Veterinary Clinic are: abortion, dystocia, retained fetal membrane, prolapsed uterine and prolapsed vagina. Previous study was not conducted on the reproductive health problems identification of the study area. Therefore this study is designed with the objectives of:

a. Determining the prevalence of the reproductive health problems and its relation with the risk factors.
b. To recommend suitable preventive and control strategy.

2. MATERIALS AND METHODS
2.1. Study Area
A cross sectional study was conducted from November, 2018 to March, 2019 in West-Belessa Veterinary clinic, Ethiopia. West-Belessa is a district in North-West Ethiopia, in Central Gondar Zone Administration. It is found at a distance of 81 km from its zone city Gondar and 178 km far from its regional city Bahirdar. It has a minimum annual average temperature 13 °C and maximum average temperature 35 °c with annual rainfall range from 800 mm to 1200 mm. It is found at 1800-2100 m high above the sea level [7].

2.2. Study Animals
The study was conducted on cows which were brought to West-Belessa Veterinary Clinic as a case for diagnosis. The Study animals were local and cross cattle breeds with different age, body mass condition and management systems. The animal histories show that these cattle under extensive management systems were allowed to graze in the field freely in day light and housed during the night in poorly constructed houses.

2.3. Study Design
A cross sectional study was conducted in extensively and semi intensively managed cows for the determination of the prevalence of reproductive health problems. Information about age, body mass condition, breeds and management systems of the study animals were gathered appropriately. The ages were determined based on owners’ information obtained and animals’ dentition pattern as described by Johnson [8] and they were recorded into age 2-4years, age >4years.

2.4. Sample Size Determination:
The sample size required for this study was determined according to Thrusfield [9]. Since there was no previous work done in this study area, 50% prevalence as an expected prevalence for sample size determination and 95% confidence interval with 5% desired absolute precision were considered. Hence the sample size is estimated as:
\[
N = \frac{1.96^2 [P_{exp} (1 - P_{exp})]}{d^2} \\
N = \frac{1.96^2 [0.5 (1 - 0.5)]}{0.5^2}
\]

Using the above formula, 384 animals were required and examined.

2.5 Data Collection

The histories of the animals which were brought with different health problems to West-Belessa Veterinary Clinic were appropriately recorded step by step and animals were diagnosed for the detection of reproductive health problems and those cows with reproductive health problems were separated and recorded carefully.

2.6. Management and Analysis

The collected data were coded and entered into Microsoft Excel spreadsheet and Statistical analyses was performed using SPSS version 20 software packages. Descriptive and regression analysis was made to know the Chi-square (X^2), the significance of the risk factors with the occurrence of the reproductive health problems and the prevalence described as percentages. Chi-square test at P<0.05 was considered as significant.

3. RESULTS

384 dairy cows which were brought to West Belessa Veterinary Clinic as a case were diagnosed and cows with major reproductive health problems were identified. From these 384 diagnosed animals, 45 cows with an overall prevalence of 11.7% were found with reproductive health problems. Age, management system, body mass condition and types of breed were taken as risk factors in order to assess their significance relation with the problems. From these risk factors, age, management system and body mass condition with their p-value (.000, .026 & .000) respectively were statistically significant with the reproductive health problems encountered. Animals breed (local and cross bred with jersey) were not significantly associated (p>0.05).

Cows with age 2-4 years were more likely being exposed (20% prevalence) to reproductive health problems than cows with age >4 years (6.6%). Cows which were held under Extensive management systems with reproductive health problem prevalence 12.3% are more likely infected than semi intensively managed cows with 9.7% prevalence. Poor body mass condition cows were more exposed to reproductive health problems than good and medium body mass condition with their respective prevalence of 15.5%, 10.7% and 7.6%. Even though the risk factor animal breed was not statistically significant, local breeds are more likely exposed to reproductive health problems than cross breed (local cross with jersey).

Dystocia, abortion, retained placenta, uterine prolapsed and vaginal prolapse with high prevalence of retained placenta were the major reproductive health problems detected during the study. The proportional prevalence of the problems: dystocia, abortion, retained placenta, uterine prolapsed and vaginal prolapsed are 2.6%, 2.1%, 5.2%, 1.3% and 0.5% respectively.

<table>
<thead>
<tr>
<th>Animals</th>
<th>Numbers of animals Examined</th>
<th>Positive Animals</th>
<th>Prevalence in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow</td>
<td>384</td>
<td>45</td>
<td>11.7</td>
</tr>
</tbody>
</table>
Table 2: Influence of different risk factors on major reproductive health problems

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Variables</th>
<th>Animals examined by number</th>
<th>Positive Animals</th>
<th>Prevalence in %</th>
<th>Chi-Square (X²)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>2-4 years</td>
<td>145</td>
<td>29</td>
<td>20</td>
<td>41.8</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>&gt;4 years</td>
<td>239</td>
<td>16</td>
<td>6.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management System</td>
<td>Semi intensive</td>
<td>82</td>
<td>8</td>
<td>9.7</td>
<td>12.7</td>
<td>.026</td>
</tr>
<tr>
<td></td>
<td>Extensive</td>
<td>302</td>
<td>37</td>
<td>12.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body mass condition</td>
<td>Poor</td>
<td>174</td>
<td>27</td>
<td>15.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>145</td>
<td>11</td>
<td>7.6</td>
<td>35</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>65</td>
<td>7</td>
<td>10.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breed</td>
<td>Local</td>
<td>332</td>
<td>41</td>
<td>12.3</td>
<td>3.6</td>
<td>.608</td>
</tr>
<tr>
<td></td>
<td>Cross</td>
<td>52</td>
<td>4</td>
<td>7.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Prevalence of major reproductive health problems of cows in West Belessa Veterinary Clinic

<table>
<thead>
<tr>
<th>Types of reproductive problems</th>
<th>Frequency</th>
<th>Prevalence in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dystocia</td>
<td>10</td>
<td>2.6</td>
</tr>
<tr>
<td>Abortion</td>
<td>8</td>
<td>2.1</td>
</tr>
<tr>
<td>Retained placenta</td>
<td>20</td>
<td>5.2</td>
</tr>
<tr>
<td>Uterine prolapse</td>
<td>5</td>
<td>1.3</td>
</tr>
<tr>
<td>Vaginal prolapse</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Total reproductive problems</td>
<td>45</td>
<td>11.7</td>
</tr>
<tr>
<td>None reproductive problems</td>
<td>339</td>
<td>88.3</td>
</tr>
</tbody>
</table>

4. DISCUSSION

This study revealed that a total of 384 animals were examined during the study period of which 45 animals showed to be affected by the reproductive health problems with an overall prevalence rate of 11.7%. This study result is relatively closer to the study results of [10] in and around Assela with the prevalence of 18.3%. It is also lower than the study reported by [11-13] which were studied at Borena Zone in Southern Ethiopia, Ada’a District of East Shoa and in Bedelle with the prevalence of 47.7%, 37.1% and 24.8% respectively. The difference in these results could be related to production system, sample size, study methodology, breed of animals and environmental conditions that might be appeared in the different study areas.

According to the study result, animals’ body mass condition is one of the good reflections on reproductive health problems with higher prevalence in poor body mass condition followed by good and medium with respective prevalence of 15.5%, 10.7% and 7.6%. This is in agreement with the study results of [14, 15]. The difference may be due to cows with poor body mass condition has low defense mechanism, high infection rate during parturition due to weakness of expulsion force of fetal membrane. This also agrees with the concept of [16] which described as low body energy reserves of cows greatly increase the probability of suffering to metabolic disorders, reproductive failure and reduction in milk.

The study also indicated the animal’s management system as a risk factor has its own effect. Cows managed extensively have increased reproductive health problems than semi intensively managed animals. This result is in line with the study reported by [15]. This difference in prevalence may be due to the difference in nutritional status, difference in exposure to injury, difference in follow-up as the variation of the management system.

Animal’s age was significantly associated with the problems and cows with age range of 2-4 years are more exposed to reproductive health problems than age range >4 years. This result is in contrary with the study reported by [17] and it is in agreement with [12]. Even though reproductive health problems in
cross breed (local breed cross with jersey) was lower than local breed, it was statistically none significant. This difference may be due to the difference in types of cross breed, sample size and the genetic variation in this cross breed are very low and they are much more similar.

In this study, abortion was recorded with the prevalence of 2.1% which is fairly in line with the finding of Haile et al. [18] who reported 2.56%. But it is lower than the study reported by [10, 17, 19&20] with prevalence results of 14.6%, 12.2%, 13.9% and 8.7% respectively. The difference in prevalence of abortion may be due to variation in genetic, nutritional status, infection, and husbandry management system in different areas.

The prevalence of retained fetal membrane (5.2%) found in the present study is higher than other reproductive health problems occurred. This study result is lower than the study result reported by [21-23] with respective prevalence of 11.5%, 14.7% and 19.2%. But it is higher than the result of [12] having prevalence of 0.8%. This variation in the incidence of RFM may be attributed to variations in predisposing factors to which the animals are subjected which include nutritional status, management such as lack of exercise, prevalence of dystocia as predisposing factor.

The current study result dystocia with the prevalence of 2.6% is in relatively similar with the study of [24] that reported as 2.9% prevalence and lower than the study results of [25,23] with the prevalence of 7.75% and 3.8% respectively. This variation in the occurrence of dystocia may be due to factors such as: age and parity of the dam. Inseminating cows with semen collected from large sized bulls without taking into account the size of cow and age of cows is an important factor in precipitating dystocia [26].

The prevalence rate of uterine prolapse in this study (1.3%) is relatively lower than the previous reports by [17, 19, 25, 27& 28] with their study prevalence of 2.7%, 0.76%, 0.43%, 0.76% and 0.56% respectively. Vaginal prolapse was the reproductive health problems with least prevalence (0.5%). This could be fairly related to the difference in the incidence of dystocia cases and occurrence associated factors.

5. CONCLUSIONS AND RECOMMENDATIONS

This current study show reproductive health problems is one of the major problems of cows in the study area. Dystocia, abortion, retained placenta, uterine prolapsed and vaginal prolapsed were the major reproductive health problems during the study. Retained placenta, dystocia and abortion are the major problems with high prevalence than the other. Age, management system, breed and body mass conditions were taken as risk factors. Age, management system and body mass conditions were statistically significant while animals breed were not significantly associated. Cows with low body mass condition, extensive management system and young ages are more exposed to reproductive health problems. In conclusion, reproductive health problems are one of the major reasons for decreased reproductive efficiency in cattle of the study area. Based on the above conclusions, the following recommendations are forwarded:

a. Proper management and feeding systems are very important to control the reproductive health problems.

b. Further detailed studies on the major reproductive health disorders in the area should be carried out.

c. Proper strategic control measures of reproductive health problems, including health education about the disease transmission, to reduce associated reproductive wastage and their risk factors is very important.

d. Giving awareness to farm owners, attendants and improve management such as: proper feeding, accurate heat detection, considering the size of sire and dam while using AI is important.

6. REFERENCE


