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Assessment of Problems Associated with Artificial Insemination Services in Damot Woide Woreda, Southern Ethiopia

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Abstract

A cross sectional study was conducted to assess the problems associated with the artificial insemination service in 6 kebeles of Wolayta Zone, Damot Woide Woreda from September 2018 to April 2019. The study was performed by questionnaire survey on 384 dairy cattle owners, animal health professionals, animal production professionals and artificial insemination technician (AIT). The major problems associated with artificial insemination service were shortage of artificial insemination technician, shortage of inputs, and distance from the dairy owners' home to the artificial insemination center, satisfaction of dairy cattle owners and weekends and holidays service. The maximum distance from dairy owners' home to the artificial insemination service center was in Bilbo Bedessa kebele (30.6%) whereas the insignificant distance from dairy cattle owners' to AI service center was in Bedessa 01 kebele (11.1%). The least service usage of artificial insemination in weekends and holidays was found in Sura Koyo kebele (3%) and the highest was found in Bedessa 01 (13.9%). The greatest shortages of AIT present in Galcha Sake kebele (93.8%) while the lowest in Bedessa 01 kebele (38.9%). There was the highest lack of government attention to AI service in Kindo Koyo 25(41.7%) while the least lack was in both Bilbo Badessa (33.8%) and Sura Koyo (33.8%). A total of 245(63.8%) of respondents were not satisfied by artificial insemination service. The questionnaire surveys indicated that artificial insemination is not doing well in all kebeles of the Woreda. Therefore, the artificial insemination service requires urgent measures to change the situation to bring about the development of this developing country.

Keywords: Artificial Insemination, Questionnaire Survey, Damot Woide Woreda

Introduction

Ethiopia owns the largest livestock population but its contribution to the overall production has shown low productivity as compared to their potential. This may be due to their low genetic potential for specific product or enough knowledge is not available on the indigenous breeds [1]. Cross breeding through AI is the most suitable economical and time tested breeding technique for generating the higher genetically potential and productive animals [2].

In spite of the presence of large and diverse animal genetic resources, the productivity from meat and milk of livestock remains low in many developing countries including Ethiopia for various reasons such as inadequate nutrition, poor genetic potential, inadequate animal health services and other management related problems [3]. Cattle breeding are mostly uncontrolled in Ethiopia making genetic improvement difficult and an appropriate bull selection criteria have not yet been established, applied and controlled [5]. Although artificial insemination, the most commonly used and valuable biotechnology has been used in Ethiopia for over 30 years, the efficiency and impact of the operation has not been well-documented [6]. Reproductive problems related to crossbreed dairy cows under farmers' conditions are immense [7].

It is widely believed that the artificial insemination (AI) service in the country has not been successful to improve reproductive performance of dairy industry [8]. AI service is weak and even declining due to inconsistent service in the smallholder livestock production systems of the Ethiopian highlands. The problem is more aggravated by wrong selection and management of AI bulls along with poor motivations and skills of inseminators [9].

Hence, the objectives of this research are:

- To identify the problems associated with artificial insemination services in the study area.
- To generate information for the better application on the sector and give feedback to decision makers to take appropriate majors on it.

Materials and Methods

Study Area:

Damot Woide Woreda has a total area of 26,550 hectors and lies an elevation ranging from 1001-2500 meters above sea level and found on latitude of 6.68-6.96 and longitude of 37.8- 38.84. Damot Woide Woreda has 23 peasants association with a total population of 125,812 (DWWANR, 2018). It was located about 406 km from Addis Ababa. Regarding the agro ecology of the woreda out of the total land size 35% is lowland and 65% midland. The annual mean temperature 17.6-25 c^o and annual mean rainfall ranges 1001-1400 mm. The livestock population was cattle (165,879), sheep (85,841), goat (95,478), equine (7,943) and poultry (105,171). (DWWLFD, 2019).

Study Population: Artificial insemination technicians, animal health professionals, animal production professionals and dairy cattle owners in six randomly selected kebeles were represented in the study population.

***Sample Size Determination*:** The required sample size was estimated by considering 50% prevalence. Thus, the sample size was calculated according to Thrusfield using 95% confidence interval and 5% absolute precision.

This is calculated by using the following formula:

$$n = \frac{1.96x^2 Pexp\ (1 - Pexp)}{d2}$$

Where,

n = required sample size
P_{exp} = Expected prevalence
d^2 = Desired absolute precision (5%)

Based on this formula, the total number of dairy cattle owners', animal health professionals, animal production professionals and artificial insemination technicians to be sampled was 384.

***Study Design*:** A cross-sectional type of study supported by questionnaire survey was carried out from September 2018 to April 2019 in six randomly selected kebeles.

Data Collection Methods: Structured questionnaires were prepared to interview dairy cattle owners', animal health professionals, animal production professionals and artificial insemination technicians and constraints associated with the service. During the interview process, every respondent included in the study was briefed about the objective of the study before starting presenting the actual questions. Then the questions were presented to the respondents.

***Data Management and Analysis*:** The data collected were entered and scored in Ms excel worksheet and coded and entered to SPSS version 20.0 for statistical analysis. Descriptive statistics analysis such as percentage and chi-square tests were used to summarize and present the data collected.

Results

From 384 dairy cattle owners, animal health professionals, animal production professionals and artificial insemination technicians data was collected by questionnaires survey in six kebeles in Damot Woide Woreda,Southern Ethiopia. A total of 245 (63.8%) respondents were not satisfied by artificial insemination service. The major problems associated with artificial insemination service in Damot Woide Woreda were the shortage of artificial insemination technician (AIT), shortage of input, distance to the artificial insemination service, shortage of weekends and holidays services, lack of government attention and lack of awareness.

Table 1: Artificial insemination used in different times and condition.

Kebele	No of respondents			Weekends and holidays service	Shortage of artificial insemination technician (AIT	Distance to the artificial insemination service	Shortage of input	Satisfaction by AI service
				No	Yes	Yes	Yes	Yes
Bedessa 01	7		2	62(86.1%)	28(38.9%)	8(11.1%)	61(84.7%)	49(68%)
Bilibo bedesa	6		2	58(93.5%)	25(40.3%)	19(30.6%)	50(80.6%)	27(43.5%)
Sura koyo	6		5	63(97%)	40(61.5%)	12(18.5%)	60(92.3%)	16(24.6%)
Kindo koyo	6		0	58(96.7%)	49(81.7%)	18(30%)	49(81.7%)	13(21.7%)
Galcha sake	6		5	60(92.3%)	61(93.8%)	15(23%)	54(83%)	15(23%)
Dawe sake	6		0	54(90%)	35(58.3%)	9(15%)	48(80%)	19(31.7%)
Total	**3**	**8**	**4**	**355(92.4%)**	**338(62%)**	**71(18.5%)**	**322(83.9%)**	**139(36.2%)**

Table 2: The results of signs of estrus used to report cows for AI service:

Kebele	No of responders			Redness of vulva	Mounting on cows/animals	Restlessness	Inapptance
Bedesa 01	7		2	20(27.8%)	38(52.8%)	10(13.9%)	4(5.6%)
Bilibo bedesa	6		2	5(8.5%)	41(66.1%)	13(21%)	3(4.8%)
Sura koyo	6		5	6(9.2%)	35(53.8%)	18(27.7%)	6(9.2%)
Kindo koyo	6		0	7(11.7%)	39(65%)	13(21.7%)	1(1.7%)
Galcha sake	6		5	5(7.7%)	33(50.8%)	19(29.2%)	8(12.3%)
Dawe sake	6		0	8(13.3%)	33(55%)	14(23.3%)	5(8.3%)
Total	**3**	**8**	**4**	**51(13.3%)**	**219(57%)**	**87(26.7%)**	**27(7%)**

Table 3: Major problems associated with AI service:

Kebele	No of respondents			Lack government attention	Inefficient AIT	Lack of awareness
Bedesa 01	7		2	26(36.1%)	11(15.3%)	35(48.6%)
Bilibo bedesa	6		2	21(33.8%)	11(17.7%)	30(48.4%)
Sura koyo	6		5	22(33.8%)	15(23.1%)	28(43.1%)
Kindo koyo	6		0	25(45.7%)	17(28.3%)	18(30%)
Galcha sake	6		5	23(35.4%)	19(29.2%)	23(35.4%)
Dawe sake	6		0	35(58.3%)	8(12.3%)	17(28.3%)
Total	**3**	**8**	**4**	**152(39.6%)**	**81(21.1%)**	**151(39.3%)**

Table 4: Results of time of insemination to be successful

Insemination time	Frequency	Percentage
Morning	3	0	679.7%
Afternoon	7	820.3%
Total	**3**	**8**	**4100%**

Discussion

Assessment of problems associated with artificial insemination service in Wolayta Zone, Damot Woide Woreda was conducted on 384 dairy cattle owners, animal health professionals, animal production professionals and Artificial Insemination (AI) technicians supported by questionery survey in six different kebels. The research showed that from the total 384 dairy cattle owners, animal health professionals, animal production professionals and Artificial Insemination Technicians (AIT) 245(63.8%) were not satisfied in different ways in the use of AI service.

This may be due to the lack of government attention, distance from the dairy cattle owners home to the artificial insemination center, presence of very little AI service during weekends and holydays, lack of awareness, wrong concepts of the dairy cattle owners due to large size of the fetus which brings the cows to dystocia during the delivery time and inefficiency of AIT. On the other hand from the total 384 respondents(dairy cattle owners, animal health professionals, animal production professionals and Artificial Insemination (AI) technicians) 139(36.2%) were satisfied by AI service. This study results agree with the reports of Tesema and Atnaf 2015.

Among the six study kebeles, Bedessa 01 had the least shortages of AIT which account that 28(38.9%) from the total study population of Damot Woide Woreda and the highest number of shortages of AIT found in Galcha Sake kebele which accounts 61(93.8%). The greatest difference between this kebeles could be due to the misplacement of the AIT by Damot Woide Woreda Livestock and Fishery Department office and concerned bodies of the woreda, scarcity of AI trained person at the woreda level and most of the AIT come to Bedessa 01 when they lack AI inputs at the kebele level and do the AI service at the center.

The highest shortage of inputs 60(93.3%) were found in Sura Koyo and the least shortage of inputs were found in Dawe Sake which accounts 48(80%). This the shortage of AI inputs may be due to uneven distribution and production of semen in both National AI center (NAIC) and SNNPRSAIC, wolayta Zone, Damot Woide Woreda Livestock and Fishery Department and to all study kebeles.

Among the study kebeles, the maximum distance from the dairy cattle owners home to AI service center was found Bilbo Bedessa which accounts 19(30.6%) and the minimum distance from the dairy cattle owners home to AI center was found in Bedessa 01 kebele 8(11.1%). The deference among the study areas in distance to AI service centerprobably due to the dairy cattle owners live in faraway from the AI service center and AI service center not found at the equal distance to all dairy cattle owners home. This study agree with the report of Desalegn, 2008.

The least AI service usage in weekends and holidays among the study kebeles were Sura Koyo2(3%), and the highest was Bedessa 01 which accounts 10(13.9%). The difference among the study kebeles were in weekend and holiday AI service usage may be due to the AIT home far from AI center and most of the time almost all AIT went to families home during weekends and holidays.

About 306(79.7%) of the dairy cattle owners choice morning as their appropriate time of insemination and 78(20.3%) of the dairy cattle owners choice afternoon as their appropriate time of insemination. This was probably due to most of them detect estrus signs when their cows are housed and observed vaginal discharge in the morning when their cows leave the barn.this study agrees with the reports Zerihun*et al*.,2013.

The highest value of AIT inefficiency was found in Galcha Sake 19(29.2%) and the least value of AIT inefficiency was Dawe Sake 8(12.3%). This is may be due to the variation of lack of job training indicating a need for upgrading the capacity of AIT by opening the way on job training through on the kebeles and lack of training given by Damot Woide Wored Livestock and Fishery Department office and concerned bodies which agrees with the suggestion of Tesema and Atinaf,2015.

From the study kebeles the highest lack of government attention to the AI service was in Galcha Sake kebele 35(58.3%) and the least lack of government attention was seen in both Bilbo Badessa 21(33.8%) and Sura Koyo 22(33.8%). This may be due to the ignorance of the responsible bodies at the regional, zonal and woreda livestock and fishery department office which agrees with the report of Desalegn.

The highest lack of awareness on AI service of dairy cattle owners was found in Bedessa 01 which accounts 35(48.6%) and the lowest lack of awareness was found in Galcha Sake 17(28.3%). This may be due to the ignorance of the responsible bodies at the government structural level.

The result of estrus sign to report cows for AI service among the study estrus signs the highest sign was redness of vulva 51(85%) and the lowest sign was inapptance 27(7%). This may be due to the shortage of knowledge of the dairy cattle owners on estrus signs and behaviors during estrus.

Conclusion and Recommendation

Artificial insemination service in the study area has been given little or no emphases at Damot Woide Woreda or kebele levels. The most important constrains associated with AI service in the study area include loss of structural linkage between AI center

and service giving units, absence of collaboration and regular communication between dairy cattle owners and artificial insemination technicians, inadequate resources interms of inputs and facilities, inefficiency of artificial insemination technician, lack of government attention, lack of estrus detection in both dairy cattle owners and artificial insemination technicians, lack of awareness of dairy cattle owners for AI service, presence of distance from dairy cattle owners home to artificial insemination service center and absence of giving concern for AI technician by Wolayta Zone and Damot Woide Woreda Livestock And Fishery Department Office. Hence it can generally be concluded that that artificial insemination in the study area on the average of total collapse unless urgent corrective measures are taken.

Depending on the above conclusion the following recommendations are forwarded;

- ❖ The Woreda and zonal body responsible to coordinate and monitor AI service should be established and very well organized in human and material resources ;
- ❖ Professional associations should critically work in close collaborations with Woreda and zonal livestock and fishery department office in formulating policies and implementation strategies;
- ❖ The AI technician and dairy cattle owners should communicate regularly;
- ❖ Trainings should be given at federal and/or zonal level for AI technician to make them efficient in artificial insemination service;
- ❖ The artificial insemination service provision should be restructured in such a way that it responds well to the breed improvement programs of the country.

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