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Assessment of Efficiency Of Artificial Insemination In Essera Woreda, Dawuro Zone; South Ethiopia

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Abstract

The study was conducted to assess efficiency of artificial insemination and identify the major constraints for efficiency of artificial insemination in Essera Woreda of Dawuro Zone. The study was performed by questionnaire survey on 32 randomly selected HHs. Purposive and random samplings were employed to select the study sites and households (HHs) of the "Woreda" respectively. Accordingly Overall Efficiency of artificial insemination in this study was 59.05. Conception failure(1st), Shortage of Semen and liquid nitrogen (2nd), Heat detection problem(3rd), Shortage of AI technicians(4th), Interruption of weekends and holidays service(5th), Travel long distance to get the service(6th) are ranked as among the Major constraints of AI service in the study area. According to the results of this study, the most important constraints associated with AI in Essera Woreda includes loss of structural linkage between AI center and service giving units, absence of collaboration and regular communication between HHs and AI technicians, lack of breeding policy and herd recording system, inadequate resource in terms of inputs and facilities and absence of incentives and rewards to motivate AI technicians. Therefore, Trainings should be given at Zonal and/or Woreda level to AIT to prevent artificial insemination failure. The AITs should have regular communication with farmers and the farmers should aware of heat detection, importance of AI and others.

Keywords: Constraints, Efficiency,Artificialinsemination, Essera Woreda

1. Introduction

In order to improve the low productivity of the indigenous Zebu cattle, selection of the most promising breeds and crossbreeding of these indigenous breeds with high producing exotic cattle has been considered as a practical solution (Mekonnen *et al*., 2010). Artificial insemination is the single most important technique ever devised for genetic improvement of animals in all aspects including milk and beef production. The development and use of Artificial Insemination technique has revolutionized cattle production and genetic improvement, particularly in the dairy sector in developed countries (Kaaya *et al*., 2005).

In Spite of the presence of large and diverse animal genetic resources, the productivity and off take rate remains low in many developing countries including Ethiopia for various reasons such as inadequate nutrition, poor genetic potential, inadequate animal health service and other management related problems (EASE, 2003). In some countries especially in the tropics, much of cattle production could be described as multi-purpose, with cows being used to provide milk, meat, clothing, fertilizer, fuel, draft power and sometimes for status or as a form of currency (Ball and Peters, 2004).

AI plays an important role to increase the yielding capacity of cows and is the appropriate and cheapest way of genetic improvement, the realization of breeding programs has to be well organized and excited in a very reliable way, and AI is fully functional when it is corporated with good animal husbandry such as effective heat detection (Noakes *et al*., 2009). Artificial insemination, the most commonly used and valuable biotechnology has been used in Ethiopia over the last 30 years (Webb, 2003).

From the previous, few study (Dekeba *et al*., 2006) 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 (Desalegn *et al*., 2008).The efficiency of AI in the country has remained at a very low level due to many constraints including; infrastructural, managerial and financial constraints and also due to technical problems such as; poor heat detection, improper timing of insemination and embryonic death. The artificial insemination program in rural bovines are greatly influenced by the status of the farmer's i.e. large marginal, small, and land less farmers. In addition, conception rate per AI service is affected by; cow related factors including cow fertility, body condition, environmental stresses, bull fertility/ quality of semen, efficiency of AI techniques and skills of the inseminators, care of the semen collected, processed and stored. The risk of all these factors varies as the type of production system, level of the dairy business and even with agro ecology. The problem is more aggravated by wrong selection and management of AI bulls along with poor motivation and skills of inseminators (Gebremedhin, 2005).

Despite the dominance of low yielding local breeds and the government's effort to provide AI at low price, the utilization rate of artificial insemination technology in Ethiopia in general and in Esera district in particular is low. Therefore, the Objectives of this study were;

- To assess efficiency of artificial insemination in the study area.
- To identify the major constraints for efficiency of artificial insemination.

2. Materials and Methods

2.1. Description of the Study Area

This study was carried out in Essera Woreda of Dawuro Zone, which is located between 6.7-7.02^0 latitudes and 36.7-37.1^0 longitudes. Essera Woreda with its capital at Bale town is situated 575km south of the capital Addis Ababa. The Woreda has a total area of 1043.1km^2 and is divided in to 29 *Kebeles*. The altitude of the district ranges from 501-2500 meters above sea level. The area receives an average annual rainfall of about 1600.5mm and has an average annual temperature ranging from 17.6 to 27.5°C. Mixed farming system is the main economic activity practiced in Essera Woreda (EWARDO, 2013).

2.2. Study Design and Sample size determination

The study design was cross sectional study. Sample size was determined according to the Arsham, 2007; $N=0.25/SE^2$, where N =sample size, SE=standard error, assuming the standard error of 8.84% considering confidence level of 95% at $\alpha \leq 0.05$. The total sample size computed will be 32 HHs.

2.3. Sampling procedures

Purposive and random samplings were employed to select the study sites and households (HHs) of the "Woreda" respectively. Three kebeles were purposively selected based on accessibility to AI center and bordering to main road. HH were selected randomly from selected kebeles. Accordingly, Dali, Bale and Ofa Cluster kebeles were selected which have accessibility to AI center. From each selected kebeles, twelve HHs were selected randomly and was be used for the study. Thus, 32 households were included in the survey.

2.4. Sources and Methods of Data Collection

The techniques included were reviewing all secondary data of AI service record of previous year and performing questionnaire survey of randomly selected owners. In addition, secondary data from published and institutional documents were reviewed to generate baseline information on AI practices.

2.5. Data Management and Statistical Analysis

The collected data was analyzed by using descriptive statistical, which refers to the use of percentages, means and tables in the process of examining and describing AI efficiency and its constraints.

3. Results

Out of the total thirty two surveyed respondents, 20 (62.5%) were male and the other were females. Majority of the respondents were farmers (78.13%) followed by housewife (18.75%) and students (3.13%). Most of the respondents were 45-54 years old (34.36%) and married (71.86%) (Table 1).

Table 1.Demographic characteristics of respondents in the study area

Variables	Category	No. of respondents	Percentage (%)
Sex	Male	20	62.5
	Female	12	37.5
Occupation	Farmer	25	78.13
	Student	1	3.13
	Housewife	6	18.75
Age	15-24	3	9.36
	25-34	4	12.5
	35-44	10	31.25
	45-54	11	34.36
	>=55	4	12.5
Marital status	Single	6	18.75
	Married	23	71.86
	Widowed	2	6.25
	Divorced	1	3.13
Educational status	Illiterate	26	81.25
	Read and write only	4	12.5
	Primary school	2	6.25

Based on the current survey, 633/1072 (59.05%) were conceived of which 270 were served by regular service while the remaining 363 were served by synchronization program (Table 2).

Table 2. Efficiency of artificial insemination in the study area

Program	Inseminated	conceived	Percentage (%)
Regular service	426	270	63.3
Synchronization program	646	363	56.8
Total	**1072**	**633**	**59.05**

Overall Efficiency of artificial insemination in this study was 59.05 this finding is in line with Henshow (1990) the first service conception rate (FSCR) was 61.7%, the overall conception rate (OCR) was 68.4% (Table 3).

Table 3. Getting AI service without interpretation in the study area

Variable	Response	Frequency	Percentage (%)
Getting AI service without interpretation	Yes	24	75
	No	8	25

Getting AI service without interpretation in current study was 75 %. This is similar with findings ofYohanis and Tilahun (2018)among 181 small holder dairy farmers in the study site, 85(47%) were used the AI service regularly and without interruption and 96(53%) didn't used AI regularly by different reasons. Out of which34(18.8%),10(5.5%), 14(7.7%), 22(12.2%), 9(5.0%)and7(3.8%)of the respondent revealed discontinuation of service on weekends and holidays, shortage of artificial insemination technician ,shortage of input, long distance to get the service, all of the above and other problem as a cause of irregular service of AI in the study area (Table 4).

Table 4. Major constraints of AI service in the study area

Variables	Frequency	Percentage (%)
Conception failure	8	25
Shortage of Semen and liquid nitrogen	7	21.9
Heat detection problem	6	18.8
Shortage of AI technicians	5	15.6
Interruption of weekends and holidays service	4	12.5
Travel long distance to get the service	2	6.3

Conception failure, Shortage of Semen and liquid Nitrogen , Heat detection problem , Shortage of AI technicians, Interruption of weekends and holidays service, Travel long distance to get the service are ranked as among the major constraints of AI service in the study area.This is similar with findingsof Yohanis and Tilahun(2018)more than half of the respondents (95(52.5%)) were unsatisfied with the overall AI service in the study area due to different problem including, semen and liquid nitrogen doesn't come on time(54(29.%)), AIT problem (19(10.5)),heat detection problem (16(8.8%)),conception failure (57(31.5%)), insufficiency support from concerned body(35(19.3).

5. Discussion

Overall Efficiency of artificial insemination in this study was 59.05 this finding is in line with Henshow (1990) the first service conception rate (FSCR) was 61.7%, the overall conception rate (OCR) was 68.4%. Getting AI service without interpretation in current study was 75 %. This is similar with findings ofYohanis and Tilahun (2018)among 181 small holder dairy farmers in the study site, 85(47%) were used the AI service regularly and without interruption and 96(53%) didn't used AI regularly by different reasons.

Conception failure, Shortage of Semen and liquid Nitrogen, Heat detection problem, Shortage of AI technicians, Interruption of weekends and holidays service, Travel long distance to get the service are ranked as among the major constraints of AI service in the study area.This is similar with findingsof Yohanis and Tilahun(2018)more than half of the respondents (95(52.5%)) were unsatisfied with the overall AI service in the study area due to different problem including, semen and liquid nitrogen doesn't come on time(54(29.%)), AIT problem (19(10.5)),heat detection problem (16(8.8%)),conception failure (57(31.5%)), insufficiency support from concerned body(35(19.3).

6. Conclusion and Recommendations

The most important constraints associated with AI in Esera Woreda includes loss of structural linkage between AI center and service giving units, absence of collaboration and regular communication between HHs and AI technicians, lack of breeding policy and herd recording system, inadequate resource in terms of inputs and facilities and absence of incentives and rewards to motivate AI technicians. In addition to this Conception failure, Shortage of Semen and liquid nitrogen, Heat detection problem, Shortage of AI technicians, Interruption of weekends and holidays service, Travel long distance to get the service are ranked as the Major constraints of AI service in the study area.

Based on the above conclusions the following recommendations are fore-warded:

- The Woreda concerning body responsible to coordinate and monitor AI service, herd recording and also livestock breeding programs needs to be established and be very well organized in human and material resources including Semen and liquid nitrogen.
- Trainings should be given at zonal and/or Woreda level to AIT to prevent artificial insemination failure.
- The AITs should have regular communication with farmers and the farmers should aware of heat detection, importance of AI and others.

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