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Effectiveness and Performance of Artificial Insemination Service Units in Supporting Agribusiness Programs and Increasing Beef Cattle Population in Pohuwato Regency

Muhammad Mukhtar[1], Darmawan Salman[2] and Rosalina Bahua[3]
[1]Animal Science Department of Agriculture Faculty, Gorontalo State University
[2,3]Agriculture Faculty of Hasanuddin University

Abstract:- The low population of beef cattle in Gorontalo Province demands the performance of the artificial insemination service units (AISU) in providing sustainable services to farmers in increasing livestock productivity. The study objectives are 1) Analyze the effectiveness of artificial insemination of beef cattle, 2) Analyze the institutional performance of AISU in response to the need for artificial insemination, 3) Mapping the active strategy and the reflective strategy adopted by the AISU institution in transforming institutional capacity into institutional performance in response to the need for artificial insemination and 4)Formulating the direction of strengthening the active strategy and institutional reflective strategy of AISU in enhancing the effectiveness of artificial insemination in Pohuwato District. In this study, randomly selected breeders were used at the AISU locations in Randangan, Popayato and Marisa Districts in PohuwatoRegency. Variables measured were Service per Conception (S/C), Calving Interval (CI), Conception Rate (CR). Formulation of direction for strengthening active and reflective strategies of AISUperformancewas analyzed by SWOT analysis. The results showed that the institutional performance of AISU in Pohuwato Regency was very effective in helping the process of artificial insemination in beef cattle indicated by an increased in the number of effective acceptors of artificial insemination followed by the artificial insemination birth rate increased and the S/C indicator number was 1.37 times, CI was 1.22 years and CR was 66.67%. These results are relatively similar to the results of previous studies so that it can be concluded that the state of S/C, CI and CR in Pohuwato Regency is better.

Keywords:- *Artificial Insemination,Beef Cattle, Calving Interval, Conception Rate, Effectiveness, Performance and Service Per Conception*

I. INTRODUCTION

The livestock sub-sector has an important role in the Indonesian economy. Livestock also has a role in supporting national food security. As one of the sources of animal protein, beef has a strategic value in the Indonesian economy. National beef production growth is relatively slower compared to consumption growth so that beef imports tend to increase over time. The low growth of national beef production as a result of the low level of productivity of beef cattle. This is caused by the cycle of cattle production where calving intervals are relatively long, cultivation technology is low and there are epidemics. If there is no significant technological change in the beef cattle maintenance system and there is no significant increase in cattle population, the gap between beef production and demand will be wider, so the import volume increases.

Artificial Insemination is one of the technologies in the cultivation of beef cattle to increase the population and genetic quality of livestock. The optimization of Artificial Insemination technology is expected to shorten births, so that it will encourage increased production of beef cattle and the added value of the domestic livestock sub- sector while creating employment. The benefits of applying artificial insemination in livestock are as follows: 1) Can regulate the distance of birth of livestock properly; 2) prevent the occurrence of inbreeding in cows; 3) equipment and technology that both spermatozoa can store for a long time; 4) Frozen sperm can still be used for several years later; 5) Avoiding accidents that often occur during marriage because the physical male is too large and 6). Avoiding livestock from transmission of diseases, especially diseases that are transmitted by sex.

One of the determining factors of the success of the artificial insemination program is the institution, namely the Artificial Insemination Service Unit (AISU) in the Department of Animal Husbandry and Animal Health. This institution which houses inseminators in carrying out the duties and functions of artificial insemination in the farmer community. The smooth implementation of artificial insemination activities needs an implementation team at both the central and regional levels. The Provincial Livestock Service Office in its capacity plans and prepares the implementation of artificial Insemination activities in the province, supervises, evaluates and coordinates the implementation of artificial insemination with relevant agencies and issues a Permit for Artificial Insemination and Pregnancy Examination Permits and Reproductive Technical Assistance. A good calving interval for cattle is 12-13 months. If the spacing of 12 months can be ascertained the cattle have high fertility. In a cattle breeding business that gives good results in reproduction the number of Service per conception (S/C) ranges between

1.6 - 2.0, the lower the value, the higher the fertility of female animals in the group. Calving interval in cows mated with Artificial Insemination can reach 65%(Kusriatmi, 2014; Hastuti, 2008; Toelihere, 2005; Bahar, 2014).

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Pohuwato Regency is one of the seed producing regions in Gorontalo Province so that the local government designs beef cattle agribusiness programs and forms an institution that deals specifically with the beef cattle agribusiness program. This beef cattle agribusiness is certainly very helpful for the government in improving the standard of living and welfare of farmers and farmers in Pohuwato Regency. Institutional Institutions of the Provincial Level Artificial Insemination Service Unit have the task of coordinating the implementation of artificial insemination, the procurement, storage and distribution of frozen sperm and artificial insemination equipment.

Based on the understanding of theoretic and empirical conditions related to the institution of artificial insemination and the effectiveness of insemination in the livestock community in Pohuwato Regency, it is an urgent topic to examine about how active strategies and reflective strategies that run on these institutions in transforming institutional capacity into institutional performance in supporting beef cattle agribusiness. Capacity is the potential that can convert input into an output system. Inputs to artificial insemination institutions are: 1) Human resources, namely inseminators, pregnancy examiners, reproductive technical assistants, 2). Natural resources in this case are beef cattle, 3). technology and 4). budget support from the government. The interaction between institutional capacity and institutional performance in the form of the adoption process of artificial insemination technology can be described, where the institutional capacity of the Artificial Insemination Service Unit can convert inputs into output by waiting for feedback from the institutional performance of AISU which produces pregnant cattle, normal livestock birth and animal health.

II. MATERIALS AND METHODS

❖ *Experimental Field*

This study was carried out in Randangan Subdistrict, Popayato Subdistrict, and Marisa Subdistrict, Pohuwato Regency in January - June 2017. The selection of sub-districts was based on the population of beef cattle and as an area of artificial insemination development. Pohuwato Regency is the second area to be targeted by the Gorontalo Provincial Government as an area that is the source of livestock procurement for the surrounding areas. In addition to the artificial insemination service system, this study also involved 150 farmers, 11 artificial insemination officers and 6 artificial insemination institutional officers as respondents.

This type of study is describing reality. The reality described is the reality of the artificial insemination service system institution (AISU) and the act of artificial insemination carried out by farmers in their communities. This study approach is qualitative, social reality is approached in qualitative terms, namely the process of running the reality. In this case the process of running the AISU institutional strategy in processing input into output. Output in this case is the result of artificial insemination.

The data of this study are primary data, namely data collected from actual situations when events occur and secondary data, namely data collected from second hand or from other sources available before the study is carried out such as comments, interpretations and discussion of original material (Silalahi, 2012). Sources of data in this study are: 1. Institutional administrators of AISU; 2. Insemination officers; 3. Farmers who do insemination; 4. Officials and staff of agriculture / livestock services.

❖ *Data Analysis*

Descriptive analysis is to describe systematically, classically and taxonomically about: 1. The types of input obtained by the AISU institution from its environment to be processed into output. The types of output produced as institutional performance of AISU, the level of institutional capacity in processing input into output; 2. Describe in a sequential manner the strategies carried out by the AISU institution in generating output, both strategies that have active and strategic dimensions with reflective dimensions; 3. Comparing the active and reflective dimensions of the strategy carried out by AISU institutions with the ideal type of strategy with active and reflective dimensions.

Analysis of the success of artificial insemination are: Conception Rate (CR), Service per Conception (S/C), Calving Interval (CI).

A. Measurment of Conception Rate

Conception rate (CR) is the percentage of pregnant women in the first insemination, pregnancy is diagnosed within 40-60 days after insemination.

$$CR\ (\%) = \frac{\text{Number of pregnant female cattle at 1 time of insemination}}{\text{The total number of female cattle inseminated}} \times 100\ \%$$

The factors that must be considered before performing Artificial Insemination are the length of the estrus cycle, the length of estrus, the time of ovulation, the fertile age of the spermatozoa (24-36 hours), the fertile age of the ovum 8-12 hours and the time of sperm capacitation. The optimum time to do insemination must be taken into account with capacitation time, which is a physiological process experienced by spermatozoa in the female genital tract to obtain capacity or ability to fertilize ovum. Insemination time in cattle is recommended not to be less than 4 hours before ovulation or not to exceed 6 hours after the end of estrus(Directorate General of Livestock, Ministry of Agriculture, Republic of Indonesia, 2012).

B. Measurement of Service per Conception

To compare the relative efficiency of the reproduction process among individuals of fertile cows, it is often used to calculate the number of insemination services (services) needed by a female until pregnancy occurs or conception. Normal Service per conception values range from 1.6 - 2.0. The lower the value, the higher the fertility of female animals in the group (Toelihere, 2005).

C. Measurement of Calving Interval

Calving interval Is the distance from one birth to the next.Calving interval is an important indicator in assessing female reproductive activity. Calving interval of 12 months can be ascertained the cattle have high fertility.

D. Analisis SWOT

Strength, weakness, opportunity and threat(SWOT) analysis was carried out to achieve the objectives of this study, namely formulating the direction of strengthening the active strategy and institutional reflective strategies of AISU in increasing the effectiveness of artificial insemination and supporting beef cattle agribusiness in Pohuwato District. This SWOT analysis is carried out by identifying the strengths and weaknesses faced by AISU in carrying out an active and strategic dimension with a reflective dimension in carrying out artificial insemination as well as opportunities and threats faced by AISU institutions in carrying out active dimension strategies and reflective dimension strategies in carrying out artificial insemination.

III. RESULTS AND DISCUSSION

A. Effectiveness of Artificial Insemination in Pohuwato Regency

Artificial insemination technology applied in Pohuwato Regency is intended to increase beef cattle population and support beef cattle agribusiness programs. The effectiveness of the implementation of Artificial Insemination in Pohuwato Regency can be seen from the number of beef cattle inseminated in 2016 in the amount of 1510 heads, from this number produced an output in the form of pregnant cattle in the amount of 1369 heads (90.66%) resulting in the birth of 948 cattle heads (62.78%). Benefit and impact of the implementation of this artificial insemination is beef cattle that live up to the age of 2 years, 850 cows are scattered in the District in Pohuwato Regency. This artificial insemination serves to regulate the distance of birth of livestock properly and prevent the occurrence of inbreeding.

With artificial insemination technology, the number of pregnant cows every year can be managed properly. If when the livestock is lustful but the male is not there then the marriage will not occur and wait for the next lust cycle. This results in a one-time reproductive cycle loss, so that the spacing of the calves becomes longer. In addition, marriage naturally also causes the occurrence of inbreeding where if pregnancy occurs, the child of the marriage brings recessive traits sometimes also causing lethal genes which cause livestock to die after birth and while still in the womb (Pradana, T, 2015).

The success of this artificial insemination program can not be separated from the role of inseminators and farmers. Inseminators carry out their duties with responsibility and carry out artificial insemination processes according to the rules. Farmers are those who interact directly with female livestock, care for their feed and carry out lust detection and report it to inseminators, and routine socialization is carried out by the Pohuwato District Animal Husbandry and Health Service and assistance by district extension agencies. This condition shown in Table 1.

Description		**Number of Farmers**		
	Respondent	**Value**	**S/C**	**Percentage**
Service per Conception (S/C)				
1 time mated	100	100		66.67
Twice mated	45	90		30.00
Third mated	5	15		3.33
Jumlah	**150**	**205**	**1.37**	**100.00**
Calving Interval (CI)			**CI**	
12-13 months or 1 - 1.1 years	43	43		28.67
14-15 months or 1.2 -1.3 years	44	54.7		29.33
≥ 16 months or 1.4 - 1.5 years	63	91.4		42.00
Jumlah	**150**	**189.1**	**1.26**	**100.00**
Conception Rate (CR)				
1 time mated	150	100	**CR**	**66.67**

Table 1:- Beef Cattle Reproduction Performance in Pohuwato Regency
Source: Primary Data Analysis, 2016

Service Per Conception (S/C) is the number of insemination services needed by a female animal until pregnancy occurs or conception. The results of study in Pohuwato Regency, from 150 farmers showed that in beef cattle the average value of S/C was 1.37. In the reproduction of S/C numbers ranging from 1.22 - 1.60. The lower S/C value means the higher fertility of cattle in the group (Toelihere, 2005).

Based on information from farmers that the value of S/C is affected by the delay of farmers in detecting lust and delays in reporting it to inseminator, in addition there are some farmers who do not know the signs of lust of beef cattle or are less careful in detecting their lust. The S/C value is affected because the farmer is late in detecting lust or late in reporting the occurrence of lust to inseminator, abnormalities in the reproductive organs of cows, insufficient inseminators, limited insemination service

facilities and lack of smooth transportation (Hastuti, 2008).

The state of S/C for beef cattle in Pohuwato Regency is still in a good range. This is influenced by good maintenance procedures and also the application of the cattle breeding system with artificial insemination technology where in general livestock that arise quickly get a response from the farmer to be reported to the inseminator officer so that the cattle are inseminated on time and eventually pregnancy occurs. This is a very good form of work from AISU.

Calving interval (CI) is the distance of time or time from the next birth period. The results of the study of 150 breeders, beef cattle in Pohuwato Regency, the average value of CI was 1.26 years. This study showed that the state of CI in Pohuwato Regency is good. This is influenced by good maintenance procedures, the application of the cattle breeding system with artificial insemination technology where all female animals as active artificial insemination (AI) acceptors have a complete record on the recording officers in AISU and inseminator itself so that the cattle that have aroused quickly get a response from breeders to be reported to inseminator officers.

Conception Rate (CR) in cattle mated with Artificial Insemination can reach 65%. The ability of female cows to be pregnant in the first insemination is strongly influenced by environmental variation (Phlilips, 2001). Possible causes of low CR, namely: sperm quality at the farmer level decreases, acceptor conditions are not good due to genetic factors, physiological factors caused by feed, temperature, climate and maintenance management, improper detection of lust due to farmer negligence in detecting lust / report to inseminator, and AI techniques that are influenced by inseminator skills in AI timeliness and sperm deposition in female reproductive organs. Based on this, it can be concluded that the condition of CR beef cattle in Pohuwato Regency is good (Ihsan, 2010).

CR ranging from 64 - 65% indicate that the level of inseminator skill at the study location is very good. This is also indicated by the low number of S/C below 1.5. The high CR value obtained is inseparable from the average nutrient content in feed every day by farmers who exceed the needs of livestock. The reproductive process runs normally if the feed ration meets the needs of growth and reproduction. The ability of female cows to bunting in the first insemination is strongly influenced by nutritional feed received before and after childbirth, where the conception rate is good if it has reached 60 percent or more (Hardjopranjoto, 1995).

Output obtained from S/C, CR and CI in Pohuwato District shows that all the numbers obtained from the S/C, CI and CR calculations provided by the respondent are good where if S/C numbers are below the number 2 which means that cattle can still breed once a year but if the S/C number is above 2 it will not reach the ideal calving distance and show that the reproduction of the cow is less efficient which makes the breeding distance longer. So that the outcome of the outcome in Pohuwato Regency is the achievement of the ideal calving distance which results in increasing the beef cattle population. Benefit and impact is that with the increase in population, the welfare of farmers will increase.

B. Institutional Performance of Artificial Insemination Service Units (AISU) in Pohuwato District

Inseminator experience shows that officers can be said to be sufficiently experienced and skilled, so that insemination is not successful because officers' mistakes should be minor. Inseminator officers who are civil servants are not only as inseminators but also as livestock extension officers in sub-districts, pregnancy examiners (PE) and paramedics. This additional task affects the number of cows that can be timely inseminated and the results of pregnancy achieved. This is one aspect that often occurs in the field, namely the limited time for inseminators to carry out their duties as inseminators, there is often a delay in insemination of lusting cattle, resulting in pregnancy failure. Inseminator officers who are not civil servants are still under the supervision of the Livestock Service Office, both the sperm straw collection system and the incentive system. Inseminator takes sperm in the AISU every time there is a request for artificial insemination (AI)

The interaction between the institutional capacity of AISU and the institutional performance of AISU is the process of adopting artificial insemination technology where the institutional capacity of AISU can convert inputs into output by waiting for feedback from the institutional performance of AISU. The process carried out by AISU in processing the existing input into output is the existence of a report from the farmer if there are more livestock, then the inseminator officer conducts an IB on the livestock. Make a recording and report it to PE officers, within 30 to 40 days after the IB has been conducted, PE officers will check the condition of the livestock whether pregnancy occurs or not and subsequently reported to the reproductive technical assistant(RTA) officer to ensure that the condition of the livestock is healthy so that the output is pregnant cattle, the number of cattle produced by IB increased, short birth intervals, the price of breeding livestock and the health of cattle. The output generated from the results of the institutional performance of AISU can be directly felt by the community and the environment in the form of improving the welfare of farmers. By the community this success has become a public information material and this activity will be sustainable.

Inputs managed by AISU in Popayato Sub-district are 2,447 beef cattle as potential acceptors of artificial insemination with 1,388 breeders' households. Inputs managed by AISU in Randangan Subdistrict are beef cattle as a potential acceptor of 5,700 artificial inseminations with 2,957 breeder households. Inputs managed by AISU in Marisa Subdistrict are beef cattle as a potential acceptor of 977 artificial inseminations with 2,957 breeder households (Statistics Center Bureau of Gorontalo Provincial, 2016).

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A very decisive factor in taking strategic steps to achieve artificial insemination programs is the availability of accurate data, especially data on beef cattle population as potential AI acceptors. The purpose of implementing population data collection is to meet the demands of a more accurate population data demand through enumerating farm households that maintain beef cattle. This data collection is also to find out the estrus cycle of cattle as acceptors so that it can be known when these animals will be inseminated.

The next step is to detect acceptors who are lustful and ready to marry, carried out by farmers and inseminators. Every day farmers can detect their livestock regularly 2 times a day, namely in the morning and evening, so that symptoms or signs of lust can be immediately observed and reported to the inseminator. The right information to inseminator causes the IB implementation time to be right so that pregnancy will occur. Accuracy in the case of lust detection by farmers or inseminator causes the AI implementation time to be correct, S/C will be good and CR is high. This has an impact on cattle pregnancy. Inseminator will implement IB in livestock after calculating the initial time of emergence of lust in livestock. The accuracy of the farmer reporting the lust time will cause the right time in the implementation of the AI.

In Pohuwato District the average implementation of insemination at high fertility results in low S/C (1.37 times) and high CR (66.67%). Pregnancy detection is carried out about 2 (two) months after insemination. Pregnancy examinations can be carried out by Pregnancy Examiners (PE) officers who have been carrying out duties as examiners in AI regions or other officers appointed by Regency/City or Provincial Technical Teams on inseminator reports.

After pregnancy detection, PE officers will make a report to the reproductive technical assistant (RTA) officer to examine the animals that have been inseminated and declared pregnant. This is to ensure that the livestock of both prospective children and their mothers are healthy. Towards the end of the cattle pregnancy, farmers and inseminator officers, PE and RTA always accompany their livestock waiting for the birth process. This is done to keep from happening something that is not desirable during the birth process.

The increase in the population of beef cattle increases from year to year. From a number of pregnant animals, AI calves will be born, which will then be maintained and cared for by the breeders until the animals are mature. Table 2 shows the birth data of livestock that received artificial insemination from AISU.

Data on the Birth of Artificial Insemination								
	2014			2015			2016	
AI	Birth	%	AI	Birth	%	AI	Birth	%
672	443	65,9	1241	756	60,9	1510	948	62,8

Table 2:- Birth Data of Beef Cattle Results of Artificial Insemination (AI) by AISU in Pohuwato Regency 2014 - 2016.
Source : Livestock and Animal Health Services of Pohuwato Regency, 2016

The transformation of capacity into performance in the sustainability of an AISU institution in Pohuwato Regency is determined by an active strategy and a reflective strategy carried out by the institution. The active strategies of artificial insemination service units include general guidelines and implementation guidelines for the development of artificial insemination which are used as a reference for artificial insemination service units and their managers to work to produce performance. The reflective strategy of the artificial insemination service unit in the form of experiences experienced during AISU stood up and began carrying out its activities is a learning for inseminator managers and officers to improve their performance so that mistakes that have been made at the beginning will be improved along with the time that continues. This will produce good output. The response of the livestock community to the application of artificial insemination technology is very good, even all livestock produced by artificial insemination develop and have a high selling value compared to natural mating animals.

C. Direction of Strengthening Active Strategies and Institutional Reflective Strategies of AISU in Improving the Effectiveness of Artificial Insemination and Supporting Beef Cattle Agribusiness in Pohuwato District.

The institutional role of AISU and the realization of its effectiveness in the field were analyzed by "SWOT" (Strengts, Weaknesses, Opportunities and Threats) by approaching several indicators that were considered to be representative and adjusted to the general conditions of the selected artificial insemination (AI) assessment area.

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Active Strategy	Internal		External	
	Strengts	Weaknesses	Opportunities	Threats
Data collection of ttle beef acceptor	There are female cow acceptor officer	Lack of transportation facilities	Farmer provide data on livestock ownership	There are farmer who do not provide ownership data
Detection of acceptor is ready to marry	Inseminator officer have reproductive records	Cattle often show no signs of lust	Farmers detect their lust 2 times a day	The farmer does not know the signs of lust
Insemination implementati on	Inseminator officers are accepted in the community	The budget managed by AISU is not sufficient in operational needs	High public interest in the artificial insemination program	Farmers report late to the officer
Pregnancy detection	Inseminator officers and PE check artificial insemination (AI) cattle after 7 days	Still needed the pregnancy examiners (PE) power	Farmers have been trained in AI centers in Singosari and Lembang	Inadvertent rectaldetection of pregnancy
Health check for child and parent candidates	Reproductive technical assistant (RTA) officers inspect lives-tock in AI for PE reporters	RTA staff facilities and infrastructure that are not sufficiently available	Farmers care about the health of their cattle	Farmers often ignore the health check of their cattle
Birth assistance	Inseminator, PE and RTA will accompany	Birth time that is not according to the schedule	Farmers usually accompany their own cattle that	Farmers are overwhelmed if their cattle
	cattle		will give birth	experience abnormalities during child birth

Table 3:- SWOT Analysis Active Strategy for Artificial Insemination Activities in Supporting Beef Cattle Agribusiness in Pohuwato Regency.

Reflective Strategy	Internal		External	
	Strengts	Weaknesses	Opportunities	Threats
Data collection of ttle beef acceptor	Officers carry out data collection	The officer did not meet the farmer	Good response from farmer	Take a long time
Detection of acceptor is ready to marry	Complete data available on acceptors and lust cycle	Inseminator officers do not Have records of acceptor livestock reproduction	Farmers quickly report to inseminators for AI	Farmers fail to detect their livestock every day
Insemination Implementation on	Obtained a high conception rate	Incomplete equipment Hampers the implementation of AI	The farmer report to Inseminator if their cattle have sign of lust	Farmers are late In detection lustfull cattle
Pregnancy detection	Pregnant cattle will not cause lust	After AI is often not follow by a pregnancy check	The farmer have Experience in examining the pregnancy of their cattle	The farmer does not tell the PE officer to inspect their cattle
Health check for child and parent candidates	RTA officers and veterinarian are always ready when there are reports	Cattle are sick so farmers do not check their cattle To RTA or veterinarian	Farmers are always responsive when there are sick cattle	Breeder neglect to check the health of the parent and prospective child
Birth assistance	Needed help from a ATR or veterinarian officer	Farmer are not equipped with equipment to Assist the birth Process of their cattle	Breeders take Good care of their livestock	Animal health workers are not in place

Table 4:- SWOT Analysis Reflective Strategy for Artificial Insemination Activities

Based on the SWOT analysis of active strategies and reflective strategies carried out by AISU of Pohuwato Regency, it can be said that the process starting from data collection of acceptor cattle, detection of ready-to-marry acceptors to monitoring and raising livestock until weaning or adult sex at the age of 2 years has been carried out accordingly with guidelines and instructions and based on experience that is usually carried out by farmers, inseminators and pregnancy examiners (PE).

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In the active strategy and the most reflective strategy the strengths and opportunities are at the data collection stage for acceptor livestock, detection of livestock ready to mate, detection of livestock pregnancy, determination of birth time and livestock raising up to 2 years old. While the weaknesses and threats are most at the stage of implementing insemination, health checks of prospective children and parents and at the stage of birth assistance.

No	Stages	Direction of Strengthening
1	Data collection of Acceptor cattle	Data collection to find out exactly which beef cattle are potential AI acceptors or active AI acceptors.
2	Married acceptor detection	The acceptor detection that is ready to mate can be seen from the record of the reproductive cycle of acceptor cattle, so that when the livestock lust will be known both by the breeder itself and by the inseminator.
3	Insemination implementation	Insemination is done at 7 hours from the onset of lust until 18 hours before the end of lust. Insemination is carried out by Inseminators on reports from farmers.
4	Pregnancy Detection	Performed by PE officer after being reported by inseminator. This examination is carried out by rectal method or physically
5	Health Check for Prospective Calves and Cows	The existence of reproductive abnormalities in cattle that have been AI will be examined by RTA officers on PE officer reports, so that reproductive abnormalities will be treated immediately and solutions are sought.
6	Birth Schedule Determination	After AI is carried out, the data of active acceptor livestock is already in the inseminator. So that if these animals are pregnant, the preliminary examination of pregnancy and the estimated birth can be done either by inseminator or PE officer.
7	Birth Assistance	Need to be done by farmers, PE officers and RTA officers to help cattle in the birth process.
8	Monitoring and maintenance by farmers	After the birth process, the calf with its mother needs to get extra attention from farmers and RTA officers both in terms of feeding, cleanliness of the cage and others.

Table 5. Direction of Strengthening Institutional Active Strategy of AISU

No	Stages	Direction of Strengthening
1	Data collection of Acceptor cattle	Data collection of acceptors needs to be done so that we have accurate data about acceptor livestock.
2	Married acceptor detection	Farmers must know the signs of livestock lust, so that if the signs are seen, the farmer will quickly report to the inseminator.
3.	Insemination implementation	The optimum time to do insemination must be taken into account with cattle capacitation time and ovulation time.
4	Pregnancy Detection	It is important to know whether the cattle are pregnant or not. If pregnancy does not occur during the first insemination, a second insemination will be carried out. This is to optimize the birth of livestock.
5	Health Check for Prospective Calves and Cows	Pregnant cows should be examined by RTA officers to find out whether the prospective child they are carrying is in good condition.
6	Birth Schedule Determination	This birth schedule can be determined after PE officers check cows that have been AI the fastest one week after IB is done rectally.
7	Birth Assistance	The time of birth of livestock must be accompanied by animal health workers and farmers.
8	Monitoring and maintenance by farmers	Maintenance of livestock from calves up to the age of adolescents and adult sex, needs to be done well.

Table 6. Direction of Strengthening Institutional Reflective Strategy AISU

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IV. CONCLUSION

The effectiveness of artificial insemination of beef cattle that took place in the community of farmers in Pohuwato District carried out by AISU was in accordance with the mechanism. Service per conception (S/C) and calving interval (CI) are ideal. The conception number (CR) was 66.67%, S/C value was 1.37 times and CIwas an average of 1.26 years.

The active strategy adopted by artificial insemination service unit (AISU) is to improve the quality of human resources of artificial insemination (AI) officers and improve the AI service performance management system so that it is expected that there will be an increase in the birth of livestock from AI while the reflective strategy adopted by AISU is AI counseling activities for farmers, especially farmers who have not implemented AI to increase acceptors effective AI in the area.

The direction of strengthening the active strategy and the institutional reflective strategy of AISU in improving the effectiveness of artificial insemination in Pohuwato Regency is referring to the guidelines issued by the Directorate General of Livestock and Animal Health of the Indonesian Ministry of Agriculture and also based on the experience of farmers, inseminators, pregnancy check-ups officers and reproductive technical assistant officers while maintaining and implementing AI.

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