The Attitude Changes Of Local Farmers Toward The Introduction Of Artificial Insemination In The Extensive Of Cattle Raising In The Seram Bagian Barat District, Maluku Province, Indonesia

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ABSTRACT

Special efforts for cow must be pregnant (Upsus Siwab) is a program for the achievement of meat adequacy in 2022 through the optimization strategy of implementing Artificial Insemination (AI) in 34 provinces including Maluku Province. One of them is Seram Bagian Barat District. The type of cattle that are kept are Bali with the extensive management. Maluku Province is The AI introduction area, so there are many challenges to meet the targets set. The purpose of this paper is to know the performance of AI introductions and the effect toward farmer attitudes in the SBB District during the 3 years of assistance. The method of this research was a survey, interviews with farmers, field officers and district officers. Data with the Ishiknas format for 3 years was collected from the Agriculture services of SBB District. Data was tabulated and analyzed descriptively. The basic problems related to the application of AI are (1) it is difficult to detect the oestrus because all cattle are released, (2) the habits of mating cattle naturally, (3) there is no interest in participating of AI, and (4) the knowledge of oestrus is very minimal. The strategy to solved the problem was introduction the hormone of Oestrus Synchronization (SE). The strategy was quite successful, in 2017, the realization of AI was 85%. Realization in 2018 and 2019 were more than 100%. The S/C score was 1.13 times indicates that the cows have very good reproductive performance. There were 15 variations in gestational age with the range of 8 months 4 days - 9 months 17 days. The most average were 9 months 10 days (16.6%) and 9 months 11 days (16.6%). The pregnancy rates of AI was 10 - 311 cows/month with an average of 108.8 cows, while in natural marriages 0 - 32 cows/month with an average of 12.5 cows. The birth weights of AI with Bali bulls straw ranged from 17 to 23 kg (an average of 19.6 kg), while the natural mating was an average of 16 kg. Another results, the birth weight of AI with Ongole bulls straw on male was an average of 32.2 kg and 30 kg on female. In 2017, the implementation of the AI was all done in combination with the SE because no farmers wanted to report the oestrus of cows. In 2018 there were reports from farmers and in 2019, all AI implementations were based on normal oestrus reports. The change in attitudes of farmers regarding adoption of AI was caused by the calves had a higher birth weight and a higher selling price. Implementation of AI in the District of SBB has good prospects for increasing the quantity and quality of cattle and also increasing the income of farmers.

Key words: Attitude change, Performance, AI, Extensive

INTRODUCTION

Seram Bagian Barat District is one of the districts in Maluku Province as a Special efforts for cow must be pregnant (Upsus Siwab), considering that the cattle population in the District is 23% of the total population in Maluku Province (Kary *et al*., 2019) and 71% of the animals raised

were cattle (BPS Kab. SBB., 2019). This program was launched at the end of 2016 (Inounu, 2017) with a target for meat sufficiency in 2026 (Risdiana and Soeharsono, 2017). The basis for implementing Upsus Siwab is Minister of Agriculture Regulation No. 48 / Permentan / Pk.210 / 10/2016, Minister of Agriculture Decree No. 656/Kpts/Ot.050/10/2016 and Minister of Agriculture Decree No. 7659/Kpts/ Ot.050/F/11/2016 (Kementerian Pertanian, 2016a; 2016b; 2016c).

The Upsus Siwab program is to spur an increasing in cattle population through optimizing the use of Artificial Insemination (AI) which was implemented in 34 provinces in Indonesia (Ditjen PKH, 2017; 2018; 2019). The eastern part of Indonesia, including the Maluku Province, is designated as an AI introduction area, where cattle management in that area is extensive (released freely in pasture). As is the case in the Seram Bagian Barat District, the types of cattle that are kept are Bali and rarely other types of cattle, suitable for extensive management indicated by good performance, rarely reported illness, normal reproductive activities. Extensive management in raising cattle is hereditary. In this management, control from farmers is very minimal, external input is very low and reproductive activities such as marriage are done naturally. The problem that arises after several years were the incidence of inbreeding and cattle performance was progressively decreases. This condition was need attention because the results of the study by Kary *et al.* (2019) shows that beef cattle business in SBB District is the main livelihood of farmers because it has the largest contribution of all revenues in number of 50.02%. This is in line with the SBB District Government program that livestock development is not only to increase population and productivity but also to increase farmers' income (BPS Kab. SBB, 2019). Another great expectation is the livestock activity can create employment and contribute to reducing the number of poor people which was reported by BPS Kab. SBB (2020) was the second highest in Maluku Province and increase from the previous year in number of 0.13% (BPS Kab. SBB, 2019).

The existence of Upsus Siwab program through the application of AI technology was expected to be a solution in increasing population and improving cattle performance, especially in SBB District and Maluku Province in general, because AI has aim to improve the quality of livestock with seeds from superior males (Dewantari dan Oka, 2020) and their implications according to Ma'sum *et al.* (2012) is increase in production and productivity of hereditary cattle, while increasing population.

SBB District as an introduction area of AI with extensive management of cattle raising have challenges to be able to continue the Upsus Siwab program through the application of the IB technology, considering the statement of Inounu (2017), at an extensive location, it was not advisable to conduct AI marriages because the cattle were difficult to touch and wild.

The purpose of this paper is to know the performance of AI introduction in the Upsus Siwab program and the change of farmers attitudes towards the application of AI technology in the SBB District during the 3 years period of assistance.

The activity was carried out for 3 years, namely from 2017 to 2019 with locations in Seram Bagian Barat (SBB) District, which included 7 sub districts, namely the Sub Districts of Kairatu, West Kairatu, West Seram, Huamual, Huamual Belakang, Taniwel and Taniwel Timur.

Information obtained from respondens, namely: farmers, field officers (Inseminators) and SBB District Agriculture Service Officers. The observation material is beef cattle which were conducted by AI or known as acceptors and calves born during 3 years of Upsus Siwab activities (2017-2019) by looking at AI rates achievement, number of AI implementation per pregnancy,

pregnancy rate, birth rate and birth weight. Data and information was collected not only in the form of Annual Reports, but also in the form of the Ishiknas format.

METHODS

The study was conducted using a survey method to see directly the implementation of activities in the field regularly and conduct in-depth interviews with farmers, field officers (inseminators) and district service officers. Collecting data consist of primary and secondary data. Primary data obtained from direct interviews with farmers, field officers (inseminators) and district service officers include farmers' perceptions of the implementation of AI in term of before and after IB implementation, challenges and problems with AI implementation. Secondary data is data that indirectly provides information that reinforces this research activity. Secondary data used in this study are data from the Agriculture Office and the Central Statistics Agency (BPS) of SBB District and relevant studies. The data obtained were tabulated and analyzed descriptively.

RESULTS AND DISCUSSIONS
Initial conditions for implementing Artificial Insemination (Application of Upsus Siwab)

Human Resources (HR) is an important factor in supporting the successfully of implementation of AI activities in the SBB District. In 2019, HR for executor of Upsus Siwab activities is presented in Table 1. These officers are required to be able to meet the target achievements as presented in Table 2. With an area of 6,948.40 km2 consist of 11 districts (BPS Kab. SBB, 2020) requires hard work to realize these targets.

Table 1.
Human resources implementing AI in order to supporting the Upsus Siwab
Program in Western Seram District in 2019.

No	The Officers	Availability of Officers				Area
		Inseminator	PKB	ATR	Handling	
1	D. Maalu					2 Sub Districts. (Kairatu and Kairatu Barat)
2	La Amihi					1 Sub District (Huamual)
3	A Loy					2 Sub Districts (Waesala and Seram Barat)
4	H.J. Keleng					2 Sub Districts (Taniwel and Taniwel Timur)
5	M. Souwala					1 Sub District (Seram Barat)
6	R. Udita					1 Sub District (Seram Barat)
7	Ereus					1 Sub District (Seram Barat)
12	Provinsi					1 Sub District (Taniwel)

(Western Seram District Agriculture Office, 2019)

Table 2.
Targets for implementing Artificial Insemination (AI) 2017-2019
in the Western Seram District, Maluku Province.

Sub Districts	Year		
	2017	2018	2019
1. Kairatu	50	124	75
2. West Kairatu	150	96	25
3. Huamual	450	150	40
4. Behind Huamual	-	-	-

Sub Districts	Year		
	2017	2018	2019
5. Weisala	200	120	-
6. West Seram	100	70	50
7. Taniwel	50	190	50
8. East Taniwel	-	-	20
Total	1.000	750	300

(Western Seram District Agriculture Office, 2017; 2018; 2019)

In the initial stage, the implementation of the AI was carried out through a visit to the location to look for oestrus of cows and at the same time socialization to the Farmers about the benefits of the AI because their acceptor have never done AI and the marriage is done naturally (mating with existing males). The effort did not expected results because it was faced with problems: (1) extensive management was difficult to detect oestrus because cattle was released, (2) farmers 'knowledge about oestrus was very minimal, and (3) farmers' interest for AI was very low even did not want because the habits of cattle was mate naturally and were not troublesome. This is very different with development areas of AI, where farmers' interest in AI can be reach 96.96% (Umam *et al.*, 2012).

Regarding these problems, the strategies carry out were (1) giving the inseminator cellphone number to the farmer so that they can report to the inseminator if the cattle is estrus, (2) continue to carry out socialization of the benefits of AI, and (3) the implementation of Estrus Synchronization. Only strategy number 3 shows the results, namely the implementation of the Estrus Synchronization (SE). According to Fauzi *et al.* (2017), SE is one way to increase the success of AI. Reported by Saili *et al.* (2016) that SE gives a good response to estrus up to 100%. The combination with AI also provides good prospects (Fauzi *et al.*, 2017; Badriyah *et al.*, 2018). Arif *et al.* (2014) reported pregnancy rates reaching 60.63% in beef cattle after SE. This means that SE has the opportunity to be widely applied. This is proven, slowly and surely the achievements of AI in SBB District began to crawl up with the implementation of SE (Dinas Pertanian Kab. SBB, 2017 and 2018).

Performance of applying Artificial Insemination

Realization of AI implementation for 3 years, increased from year to year (Figure 1) and even exceeded the target. This shows that the implementation of AI in SBB District shows an improved response from the farmers.
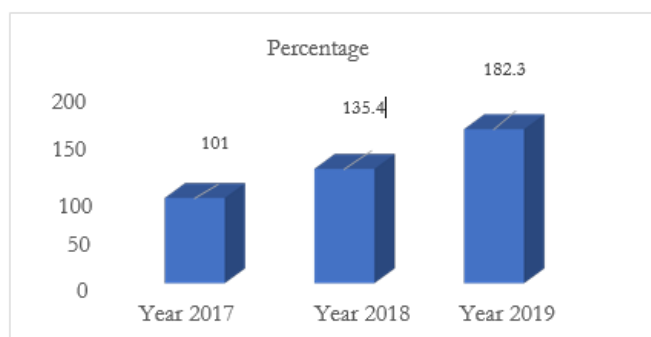

Figure 1.
Realization of AI implementation for 3 years (2017-2019) in SBB District.

The application of SE greatly helps the implementation of AI by inseminators, because the sign of estrus was caused by the injection of the hormone was quite clearly in the form of vulva mucus. This is in line with the results of previous studies (Handayani *et al.*, 2014; Sudarmadji *et al.*, 2007; Fauzi *et al.*, 2017). Estrus arises on average 2-3 days after injection of SE and then continued by AI (Utomo *et al.*, 2020). Fauzi *et al.* (2017) reported that estrus appeared 30-40 hours after hormone injection. SE hormone injection in Upsus Siwab activities in SBB District was only done 1 time (no repetition was done on the 11th day), because of the limited availability of hormones and far reaching areas. In general, SE hormone injections were only done 1 time, although some were done up to 2 times. Based on the calculation was obtained Service per Conception Rate (S/C) of 1.13 times, this shows the cows in a very good reproductive performance. The normal limit according to Ihsan and Wahyuningsih (2011) is around 1.5-2. S/C is one of the benchmarks for evaluating reproductive efficiency in AI programs (Deskayanti *et al.*, 2019; Hastuti, 2008; Hoesni, 2015; Badriyah *et al.*, 2018). The low of S/C can provide the ideal of calving interval (12-13 months). This is proven by Novita *et al.* (2019), which is reported with a S/C value of 1.2 having a calving interval of 12.36 months.

The results of S/C in SBB District was smaller than the results of reports from Upsus Siwab of Maluku Province where S/C was reported the number of 2.2 times (Utomo *et al.*, 2020). According to Suranjaya *et al.* (2019) if the S/C number greater than 2 caused will not achieving the ideal of calving interval, the reproduction of the cattle is less efficient because the calving interval is longer.

There are 15 variations in the lenght of gestation, that was in the range of 8 months 4 days - 9 months 17 days. The average was 9 months 10 days (16.6%) and 9 months 11 days (16.6%). Ridha *et al.* (2007) reported that the lenght of gestation in Bali cattle was 288.37 days (9 months 6 days).

Increased livestock population can be spurred through the application of AI, this indication can be seen from the monthly pregnancy rate. AI pregnancy rates are reported in range of 10 - 311 heads/month with an average of 108.8 heads/month, whereas in natural marriages with extensive management in range of 0 - 32 heads/month with an average monthly was only 12.5 heads.

Adoption of AI technology

In 2017, the implementation of the AI was all done in combination with SE because no farmers wanted to report their estrus of cows. In 2018, it was still budgeted for the procurement of SE hormones, but there have been reports of estrus from farmers and have asked for AI. This indication shows that in 2018 AI technology has begun to be adopted by farmers. In 2019 all AI implementation was based on a normal estrus report, so the procurement of SE hormones was no longer budgeted. Thus in 2019, all farmers already want to adopt AI technology.

The change in attitudes of farmers was caused by the calves produced have a higher birth weight and a higher selling price. This is in line with what was reported by Umam *et al.* (2012), that the greater of birth weight has encouraged farmers to increase AI interest. Likewise, reported by Ma'sum *et al.* (2012) that the main factor forming the perception of beef cattle farmers about AI technology was an increasing in AI yield and relative profits.

The birth weights of IB with Balinese straw ranged from 17 to 23 kg (an average of 19.6 kg/head), while the natural mating in extensive management was averaged of 16 kg. The birth weight of natural mating in SBB District were relatively greater than those reported by Talib (2002) where the average birth weight of Balinese calves in South Sulawesi was in range of 12-13

kg, in East Nusa Tenggara (NTT) was in range of 10.5-15 kg, but in Bali was larger in range of 16-16 kg. Whereas Riwu and Kihe (2015) reported the birth weight of Balinese calves at the farm level without the application of technology of 12.7 kg. According to Sariubang et al., (1998) and Depinson (2010), the mating system can improve the birth weight of Balinese calves. While the birth weight of AI with Ongole's straw has average of male was 32.2 kg dan 30 kg of female.

Since 2018, based on AI experience that has been applied, there has been a desire (motivation) of farmers in SBB District to improve the quality of calves. The positive attitude of the farmers according to Mahalubi et al. (2019) was greatly influenced by his personal experience. Motivation from farmers who have emerged according to Fadwiwati et al. (2019) needs to be built through accompaniment and demonstration. The results of demonstration in the field (implementation of AI in Upsus Siwab Program) in the form of (1) the higher calves quality, (2) shorter calving interval due to low of S/C and (3) normal length of gestation can directly provide evidence and learning to the farmers in SBB District.

After nearly four decades since AI was introduced, the phenomenon of public response to AI technology according to Ma'sum et al. (2012) still varies. But in the SBB District, it took 3 years to build a positive perception of the application of AI technology. The implementation of AI in SBB District has good prospects for increasing the quantity and quality of cattle at once increasing the income of farmers and can be a solution in poverty alleviation programs.

CONCLUSION

The application of Estrus Sinchronization (SE) is very helpful in the application of Artificial Insemination (IB) in extensive management.

Evidence the quality of the calves and the higher sale value was the starting point of the farmer's interest in implementing of AI.

The performance of AI implementation in the Upsus Siwab program in SBB District was considered successful and it was indicated by the realization was exceeded the target, low of the S/C value and high monthly pregnancy rate, so that it could trigger an increasing of population in the SBB District.

AI technology needs to be introduced to other sub-districts to spur increasing of cattle population in the SBB District.

Improving the quality of Human Resources of field staff and supporting IB infrastructure is needed to support the success of animal husbandry development in the SBB District.

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