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**THE EFFECT OF BREEDERS' COMPETENCE ON REPRODUCTION MANAGEMENT
TOWARDS THE REPRODUCTION EFFICIENCY OF BEEF COWS: A CASE STUDY
OF BREEDERS PARTICIPATING OF UPSUS SIWAB PROGRAM IN SEMBAWA
SUBDISTRICT OF BANYUASIN REGENCY, INDONESIA**

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ABSTRACT

The purpose of this study is to determine the level of breeders' and artificial inseminators' skills on reproductive management, reproductive efficiencies of their beef cows, and the effect of their skills on reproductive managements on the level of reproductive efficiency of their beef cows. The method used in this research is a case study with qualitative approach. The respondents were beef cattle breeders and inseminators. From the results of this study, it is indicated that breeders' knowledge on reproductive management is categorized into lacking. On the other hand, breeders' attitude on Upsus Siwab program is categorized into "agreed", and breeders' skills in implementing reproductive management are categorized into "sometimes". Moreover, inseminators' knowledge on technical artificial insemination (AI) is categorized into "knowing", inseminators' attitudes on AI are categorized into "agreed", and inseminators' skills on technical AI are categorized into "capable" and "always". Besides, it is found that 50.9% of Service per Conception is infertile, 47.3% is less fertile, and 1.8% is normal. For the Calving Rate, it is found that 98.2% are categorized into excellent (80%-90%), and the Calving interval value is 100% categorized into optimal (12 months).

KEY WORDS

Breeders, reproductive management, beef reproduction.

In line with the growth of population and the increase of Indonesian people income, the demand of livestock products, especially beef, is increasing. The increase is indicated through the increasing trend of meat consumption in Indonesia illustrated by the increase of cow slaughtering in recent five years (Sirajuddin et al., 2016).

On the other hand, the supply of local beef has only fulfilled 65.24% of national total needs. The shortage is fulfilled through importing, both cows and frozen meat (Agricultural Ministry, 2017). Then, to fulfill the needs of meat, especially beef, in Indonesia, the government through Agricultural Ministry has a program called Special Attempt (*Upaya Khusus*, abbreviated into Upsus) for Mandatory Cattle Breeding (*Sapi Parentan Wajib Bunting*, abbreviated into Siwab) in 2017.

Upsus Siwab program is a national program to develop breeders' beef cows as it is implemented in Banyuasin Regency of South Sumatera Province. Banyuasin government's concern in increasing beef cow's productivity is very high. Thus, it becomes an attempt to be beef self-sufficient Banyuasin Regency (Susanti, 2015).

To succeed the attempt, human factors become a pivotal factor in AI program success because they have central role in AI service activities. Besides human factors, facilities and field condition are very dominant factors (Sirajuddin et al., 2018). Moreover, breeders' skills are needed in running cattle reproduction management to get its reproduction efficiency. Affandhy et al. (2007) stated that appropriate mating management technique through AI technique or nature mating which is appropriate to surroundings is expected to increase the number of calf birth and increase a number of good quality parent which finally can increase breeders' income from beef cow business.

Beef cow business for people in Banyuasin is a part-time business. Raising cattle is commonly shepherded in palm and rubber plantation in order to meet its feed needs. Thus, to optimize female beef cows' reproduction in term of observing lust and exact time of mating will be difficult to do. As a result, reproduction efficiency of beef cow parent cannot be achieved. In fact, according to Andriyanti et al. (2017), what commonly occurs is that breeders are less skilled in noticing the estrous of cattle and they barely know the exact time when Conception Rate (CR) is high before AI.

Thereby, regarding the aforementioned explanation, the researcher is interested in conducting a research about breeders' level of skills, inseminators' level of skills, and the effect of breeders' skills in reproduction management on reproduction efficiency of beef cows parent in Sembawa Subdistrict of Banyuasin Regency in order to achieve the success of Upsus Siwab program implementation in increasing the number of population of beef cows.

METHODS OF RESEARCH

The study was conducted from July to August 2019 in Sembawa Subdistrict of Banyuasin Regency in South Sumatera Province.

Triangulation technique is used to collect data in the forms of: 1) survey (interview with the guide of questionnaire) to beef cows' breeders in 3-chosen villages in one subdistrict and inseminators who were asked to do AI in the observed area; 2) observation which was conducted through direct observation in the field, and; 3) data and opinion collection from agencies or officers who could be representative for this study.

The primary data were obtained from the results of observation and interview with respondents using a questionnaire. The data entail characteristics and breeders' skills, inseminators' skills, and reproduction efficiency of beef cows.

The secondary data entail the profile of Banyuasin and Sembawa, theories and other scientific facts obtained from Upsus Siwab reports which were available in Isikhnas application, literature through scientific journals, mass media, internet, results of previous studies, and other literatures related to the topic of this study.

The indicators measured in this study involve breeders' skills, inseminators' skills, and reproduction efficiency of beef cows' parent. In this case, breeders' skills on reproduction management of beef cows' parent and inseminators' skills on AI technique involve three components of skills with sub-variable: knowledge (cognitive), attitude (affective), and skills (psychomotor). The measurement on breeders' and inseminators' skills can be seen in Table 1 and Table 2.

Table 1 – The Category of Breeders' Skills on Reproduction Management of Beef Cows Parent

Indicators	Knowledge (<i>Cognitive</i>)	Attitude (<i>Affective</i>)	Skills (<i>Psychomotor</i>)	Score
Lust and mating time observation	Know	Agree	Always	3
Mating Pattern	Fairly know	Fairly Agree	Sometimes	2
Conception Observation	Don't know	Disagree	Never	1
Birth				

Table 2 – The Category of Inseminators' Skills on Artificial Insemination Technique

Indicators	Knowledge (<i>Cognitive</i>)	Attitude (<i>Affective</i>)	Skills (<i>Psychomotor</i>)	Score
Management of AI tools	Don't know	Disagree	Never	1
Plan of frozen cement needs	Fairly know	Fairly Agree	Sometimes	2
Defining the appropriateness of acceptor				
Management of frozen cement	Know	Agree	Always	3
Implementation of AI				
Evaluation of the result of AI				

Moreover, the measurement of reproduction efficiency of beef cow parent involves some indicators, such as service per conception (S/C), calving rate (CR, %), and calving interval (CI, day). The measurement of reproduction efficiency of beef cow parent can be seen in Table 3.

Table 3 – The Category of Reproduction Efficiency of Beef Cow Parent

Indicators	Criteria
<i>Service Per Conception</i>	Normal (1,6-2,0)
	Less fertile (2,1-2,5)
	Infertile (2,6-3,0)
<i>Calving Rate</i>	Very good (80-90%)
	Good (60-70%)
	Bad (40-50%)
<i>Calving Interval</i>	Optimal (12 months)
	Less optimal (15 months)
	Not optimal (20 months)

The reasons of conducting this study in Sembawa Subdistrict of Banyuasin Regency are that: 1) it has natural potency for the development of beef cow commodities; 2) there is BPTU-HPT Sembawa which is as UPT of Agricultural Ministry in animal husbandry and as the coordinator of Upsus Siwab Program in South Sumatera Province; 3) it produces the highest number of calf births in Upsus Siwab Program in Banyuasin Regency.

The technique of sample collection used in this study is multi-stage random sampling. The technique is conducted in two or more stages of a population which members are grouped into two or more stratified group (Paturochman, 2012).

The respondents of this study are beef cow breeders in Sembawa Subdistrict of Banyuasin Regency who get AI service in Upsus Siwab program and inseminators who administer AI in the researched areas. Those area become the sample of study because—according to data of reports in Isikhnas application about the recapitulation of Siwab in each subdistrict—the rate of beef cows' births in Sebawa in 2018 was the highest. Then, based on the highest number of beef cow availability stated in the recapitulation of Cattle Birth Rate on Isikhnas application, three villages in Sembawa are obtained, namely Purwosari Village (50 beef cows), Rejodadi Village (32 beef cows), and Lalang Sembawa (29 beef cows).

Then, 50% of the number of beef cow availability was used to determine the number of breeders as the respondents from each village. Finally, 25 respondents from Purwosari Villages, 15 respondents from Rejodadi Villages, and 15 respondents from Lalang Sembawa Villages were obtained. Thus, the total of beef cow breeders as the respondents are 55.

The data obtained are then analyzed qualitatively and quantitatively. The qualitative analysis is conducted using descriptive approach. Meanwhile the quantitative analysis is conducted using Structural Equation Model (SEM) to analyze the effect of breeders' skills on reproduction management of beef cows in Sembawa, Banyuasin. For the quantitative analysis, the data are recapitulated using MS Excel 2016 and SPSS 18, and then analyzed using PLS program.

The characteristics of beef cow breeders in this study involve: age, formal and nonformal educational background, raising cattle experience, information sources, and involvement in training on reproduction management of beef cows.

From 55 respondents, 56.4% of them are middle-aged adults, 30.9% are young adults, and 12.7% are older adults. Sirajuddin et al. (2018) said that breeders' age can influence their work productivity in agricultural business activities. Besides, age relates to mindset in determining management system that will be conducted in their business.

In term of information resources about cultivation or reproduction management of beef cow parent, 92.7% of the respondents obtain information from parents/ other breeders/ neighbors/ relatives, 5.5% of them obtain information from other resources, and 1.8% of them obtain information from instructures/ private instructures/ animal husbandry department. According to Abdullah (2016), instructure officers are the main support for breeders. Sharing information among breeders is an appropriate way to solve problem they have.

In term of formal educational background, 63.6% of the respondents graduated from elementary school up to junior high shool, 36.4% graduated from the level of senior high school or diploma or bachelor. On the other hand, in term of nonformal educational background and involvement in training, 94.5% of them revealed that they had never joined training, while 5.5% of them reveal that they had joined training about 1 to 5 times. According

to Suharyati and Hartono (2015), breeders who have high educational background will be at ease in receiving knowledge about good raising cattle. Good knowledge on raising management and reproduction management can increase the efficiency of reproduction. Sirajuddin et al. (2018) also agreed that breeders' level of education can influence their ability and implementation of husbandry management.

In term of raising cattle experience, 34.5% of the respondents have raised beef cows for 1 to 5 years and 65.5% of them have raised beef cows for 6 or more years. According to Sumadi et al. (2018), breeders who are in productive age and supported by raising cattle experience will influence raising cattle management. According to respondents' involvement in training of reproduction management of beef cows, 5.5% of them had once joined training, while 94.5% had never joined.

Based on the condition of beef cow parent cultivation, 64% of the respondents mostly raise local cows (Bali Cattle). Moreover, 7% of the respondents raise Limosin, 7% raise Simental, and 22% of them raise other kinds of cows, such as Brangus, PO, etc. The local cows are mostly raised because of some aspects, such as cheap feed, easiness in raising cows, disease resistant, and relatively fast developing and growing. According to Suharyati and Hartono (2015), Bali cattle have any benefits, such as fast breeding, high fertility, easy to adapt with environment, can live in critical land, having good ability in digesting feed, and having high percentage of carcasses. Another benefit in term of the development of Bali cattle population is that it is quite good for calving interval.

In term of shed condition, 82% of the respondents' shed are in the form of cement floor and water used is from well and 16% of the respondents' shed are in the form of ground floor and the water used is also from well. The reason why the respondents construct cement floor for the shed is that it is easy to be cleaned. Besides, the reason of using water from well is that water from well is easily to be obtained. Regarding the condition of shed, Permentan (2015) stated that the construction of shed should be strong, easily obtained, long lasting, save for cattle, and easily cleaned.

Then, in term of the availability of shading trees for shed, 84% of respondents argued that shading trees for their shed are available. They revealed that the shading trees for shed is used to decrease the direct sun light and decrease the heat inside the shed. Permentan (2015) suggested that shed construction should have good air circulation and sufficient morning sunlight.

In term of shed direction, 44% of the beef cows' sheds are constructed without concerning the direction, 35% of the sheds face on west-east, and others face on north-south. The reason of constructing the shed without concerning the direction is that the shed has to adjust with the available land. However, Suharyati and Hartono (2015) stated that the shape of shed can influence the value of CR. A good shed is the one which is appropriate and fulfill the requirements of cows' needs and safety. If both elements cannot be fulfilled, disorders in cattle's physiological function, including the reproduction disorders, can occur. Therefore, opened-shape and wide shed providing good air circulation is necessary to support good reproduction efficiency. Permentan (2015) suggested that shed construction should be longitudinal from west to east.

For the sources of feed, 95% of respondents stated that greenish cattle feed is obtained from weeds, while the rest are obtained from cultivated grass. Most of the respondents feed their cattle with weeds because they are easily obtained and available around rubber or palm plantation. In this case, rubber, palm, and other plantations, according to Rusdiana et al. (2018), can solve breeders' problem in finding feed; thus, they will not find any difficulties.

Regarding the age of female beef cows on which they are first mated, it is found that 71% of the respondents mate their cattle on 14-16-month old, while others mate their cattle on 2-3-year old. They argued that 14-16-month female beef cows have showed its lust, and it is an ideal time to be mated. According to Suharyati and Hartono (2015), the age on which it is firstly mated is positively associated. It means that the longer the cattle mated the longer the calving interval.

In term of giving balanced feed when beef cow parent is pregnant, 71% of the respondents give balanced feed irregularly, 16% of the respondents never give balanced feed, and the rest give balanced feed regularly. Those who give irregular balanced feed stated that giving balanced feed depends on the cost and feed sources availability. In this case, Suharyati and Hartono (2015) said that cattle obtaining good nutrition feed will be able to process good hormonal reproduction process. Moreover, Ardiansyah et al. (2016) added that pregnant parent needs additional nutrition to improve the number of days open, S/C, and to smoothen the calving process.

In term of uterine infection prevention after childbirth, 47% of the respondents sometimes do the prevention, 47% of them never do the prevention, and the rests of them always do the prevention. In this case, those who do uterine infection prevention do it irregularly because it depends on their memory and opportunity to do it. On the other hand, those who do not do the prevention stated that they never experience the uterine infection. According to Sutiyono et al. (2016), to prevent reproductive failure caused by abnormal ovary, female cows which will be used as the cow parent should be carefully selected.

In term of miscarriage, 96% of beef cow parents never have miscarriage. Respondents stated that they always keep beef cow parents' health while pregnant tso that the calving process can be successful. According to Inounu (2017), the role of veterinarian, PKb and ATR officers are essential because early treatment will determine the success of mating program, both in natural mating and artificial insemination.

In term of calving process control, 75% of the respondents control the calving process by themselves, 18% of breeders and officers control the calving process, and the rests stated that officers control the calving process. The respondents control the calving process because, based on their experience, the calving process is always normal. They will look for officers when any difficulties during the calving process occur. According to Partodihardjo (1987), when the calving process of animal parent seems healthy and the *partus* process is normal, any help is not needed.

In term of obtaining colostrum for calf, 73% of the respondents help calves to obtain colostrum from their parent, 22% of them wait the calves to be able to obtain colostrum by itself, and other respondents do not help for it. Those who help the calves obtain colostrum can help the calves obtain colostrum easily, so they can be stronger. Inounu (2017) stated that good calving handling will determine the success of cattle until the weaning age which then can be reliable for them to be cattle feeder for meat producer.

Finally, in term of unwillingness of cow parent to breastfeed, 91% of the respondents force the parent to breastfeed the calves after the calving process, 5% of the respondents call officers, and the rests choose to make formula milk instead of colostrum. The reason why the respondents force the parent to breastfeed the calves is that colostrum is very important for the calves' health. By obtaining colostrum, the calves will obtain better nutrition. According to Rahayu (2015), the nutrition of colostrum is higher than noncolostrum milk. Colostrum contains more protein (especially in the form of *lactoglobulin* or *gamma globulin*), mineral, fat, and vitamins than general milk. Besides, colostrum contains lower lactose than general milk.

After each indicator has number, average score is then calculated. The score is then involved in the interval class using the following formula.

$$\text{Interval} = \frac{\text{The highest score} - \text{The lowest score}}{\text{Number of question criteria}}$$

Thus, the interval score is:

- Minimum Score: 1;
- Maximum Score: 3;
- Interval: $3 - 1 = 2$;
- Interval Range: $(3-1)/ 3 = .67$.

The category of breeders' skills on reproduction management of beef cow parent can be seen in Table 4.

Table 4 – Category of Skill Class of Beef Cow Breeder Respondents

Interval	Knowledge (Cognitive)	Attitude (Affective)	Skills (Psychomotor)
1.00 – 1.67	Don't know	Disagree	Never
1.68 – 2.33	Fairly know	Fairly agree	Sometimes
2.34 – 3.00	Know	Agree	Always

Figure 1 shows the distribution of frequency of respondents' responses in each indicator (knowledge, attitude, and skills):

Figure 1 – The Graphic Score of Respondents' Knowledge

Based on the frequency distribution on cognitive indicator, the average score is 2.2 belonging to interval 1.68-2.33. It means that respondents' responses on questions for cognitive indicator on reproduction management of beef cows are categorized into "fairly know". According to Abdullah (2016), age will influence the breeders' skills in learning, understanding, accepting, adopting a technology, and in increasing work productivity.

The frequency distribution of respondents' responses on affective indicator in reproduction management of beef cow parents can be seen in Figure 2.

Figure 2 – Graphic Score of Respondents' Attitude (Affective)

Figure 3 – Graphic Score of Respondents' Skills (Psychomotor)

Based on the frequency distribution of affective indicator, the average score is 2.5 belonging to interval 2.34-3.00. It can be inferred that the respondents' responses on benefits of Upsus Siwab Program are categorized into "agree". Inounu (2017) revealed that this program is established to solve the problem about the increase of meat production to balance the supply and demand of meat in the country which is increasing sharply. Breeders' responses on the psychomotor indicator can be seen in Figure 3.

Regarding the frequency distribution of psychomotoric indicator, the average score is 2.3 belonging to interval 1.68-2.33. It can be inferred that respondents' responses on psychomotor indicator questions are categorized into "sometimes". Chudleigh et al. (2017) stated that developing knowledge and skills of management team who is inexperienced and developing their decision-making process can significantly increase their decision making and business profit.

Inseminators' responses on cognitive indicator are 100% which is categorized into "know". Jemal et al. (2015) argued that good-quality inseminator selection is a pivotal element in AI program success.

Moreover, inseminators' responses on affective indicator on reproduction management of beef cow parent are 100% which is categorized into "agree". According to Diskin et al. (2016), during the AI implementation, the efficiency of inseminator is influenced by the cement control and the technicians' ability to store cement in the right place.

In addition, inseminators' responses on skills (psychomotor) on AI of beef cow parent are 100% which is categorized into "always" and "capable". Affandhy et al. (2019) stated that one of the factors influencing level of mating is the inseminators' skills.

To analyze each indicator on reproduction efficiency of beef cow parent, the value is included in the indicator class. The score level of reproduction efficiency of beef cow parent can be seen in Figure 4.

Figure 4 – Graphic Score of Reproduction Efficiency of Beef Cow Parent

Regarding Figure 4, 50.9% of S/C is categorized into "less fertile", 47.3% is categorized into "infertile", and 1.8% is categorized into "normal". According to Toelihere (1979), the value of S/C is about 1.6-2.0. The lower the value of S/C is the higher the fertility of female cattle in its group.

Based on Clving Rate category, 98.2% is categorized into "very good" and 1.8% is categorized into "good". (Suharyati & Hartono, 2017) stated that one of the factors influencing the number of CR is the cattle fertility. In this case, the calving interval depends on the distance between marriages after calving. The 12-month calving interval is the optimal value in term of the point of rejuvenation, and is as well as 15-month interval in term of the amount of milk production during lifetime (Salisbury, 1985). Based on the category of Calving Interval, all are categorized into "optimal". According to Zainudin et al. (2014), the longer the value of CI is the lower the reproduction efficiency of the parent.

Measurement model for validity and reliability test, determination coefficient model, and jalur coefficient for equation model can be seen in Figure 5.

Figure 5 – Measurement Model

The number between latent variable and indicator is called standardized loading factor (loading factor value) which measures construct. If the number of standardized loading factor is more than .5, it is valid (Nuraini et al., 2016).

Table 5 – Loading Factor

n/n	Original Sample (O)	Critical Point	Conclusion
CI <- Efficiency		.5	Invalid
CR <- Efficiency	.096161	.5	Invalid
K <- Management	.780986	.5	Valid
P <- Management	.736378	.5	Valid
S <- Management	.575244	.5	Valid
SC <- Efficiency	.999060	.5	Valid

Based on the table, the convergent validity of measurement model using loading factor shows that the indicator K, P, S, and SC has loading factor value which are higher than .5. Therefore, indicator K, P, S, and SC are valid.

On the other hand, indicator CI and CR are invalid because the loading factors are lower than .5. Since CI and CR are invalid, those indicators are excluded from the model. Then, loading factor test is re-administered. The following figure shows loading factor test result after excluding indicator CI and CR.

Figure 6 – Measurement Model after Drop

Table 6 – Loading Factor after Drop

n/n	Original Sample (O)	Critical Point	Conclusion
K <- Management	.777673	.5	Valid
P <- Management	.733512	.5	Valid
S <- Management	.585512	.5	Valid
SC <- Efficiency	1.000000	.5	Valid

Regarding the table, all indicators have loading factor value more than .5. Therefore, it means that indicator K, P, S, and SC are valid.

Convergent validity of measurement model with reflective indicator is measured based on the correlation between item score/ component score calculated using PLS program. Individual reflective measurement will be high if it correlates more than .70 with the measured construct (Sari & Rahman, 2019).

Since the construct of efficiency has AVE value which is more than .5, it can be inferred that its convergent validity is good. Moreover, since the construct of management has AVE value of .495213 (.5), it can be concluded that its convergent value is good.

Discriminant validity test is administered to prove whether the indicator of a construct will have the highest cross loading value on its construct among other constructs. Cross loading test can be seen in Table 8.

Table 7 – AVE

n/n	AVE
Efficiency	1.000000
Management	.495213

Table 8 – Cross Loading

n/n	Efficiency	Management
K	.149304	.777673
P	.150098	.733512
S	.092293	.585512
SC	1.000000	.190329

Regarding the table, compared to the construct of efficient, the value of indicator K, P, and S is higher than the construct of management. Thus, it can be concluded that indicator K, P, and S have good discriminant validity. Besides, compared to the construct of management, the indicator SC has higher cross loading value toward the construct of efficiency. Thus, it can be concluded that indicator SC has good discriminant validity.

According to Widyastuti (2018) in PLS program, the indicator is reliable if the value of composite reliability is $> .7$ even though the composite reliability value of $.6$ can still be accepted for exploratory study, and the value of AVE should be $> .5$. The result of composite reliability test and cronbach's alpha can be seen in the following table.

Table 9 – Reliability Testing

n/n	Composite Reliability	Cronbach's Alpha
Efficiency	1.000000	1.000000
Management	.743784	.498448

It is stated that the construct will be reliable if the composite reliability is above $.7$ and the cronbach alpha is above $.6$. Regarding the output in the table, the construct of efficiency has composite reliability value which is more than $.7$ and the cronbach's alpha is more than $.6$. Thus, it can be concluded that efficiency has good reliability. On the other hand, the construct of management has composite reliability which is above $.7$ and cronbach's alpha is below $.6$. Then, it can be concluded that the reliability of management is fairly good.

The structural testing in PLS program is evaluated using R^2 for dependent variable and coefficient path value for independent variable which significance is then scored based on t-statistic of each path. The structural model of this research can be seen in Figure 7.

Figure 7 – Standardized Model

Regarding Figure 7, the equation obtained by efficiency is $.190$ and the management (R^2) is $.036$. From the equation, it can be concluded that:

- The value of R^2 efficiency is $.36$, meaning that reproduction efficiency is affected by reproduction management of beef cow parent with 3.6% , meanwhile the rest is affected by other careless factors while conducting this study;
- The coefficient path of management is $.190$ with positive direction, meaning that there is similar direction relationship. If reproduction management of beef cow parent increases 1 unit, the reproduction efficiency of beef cow parent will increase $.190$, vice versa.

Regarding the data analysis, to conclude the result, hypothesis testing is conducted as the following:

- H_0 : independent variable has no effect on dependent variable;
- H_1 : independent variable affects on the dependent variable;

Criteria of testing:

- H_0 is rejected if $t_{\text{statistic}} < 1.96$;
- H_0 is accepted if $t_{\text{statistic}} > 1.96$.

Figure 8 – T-Value Model

Table 10 – Partial Hypothesis Test

n/n	Original Sample (O)	T Statistics (O/STERR)	Conclusion
Efficiency Management	0,190329	4,497010	Ha accepted

The $t_{\text{calculate}}$ between reproduction management and reproduction efficiency of beef cow parent is 4.497010. Since the value of $t_{\text{calculate}}$ is higher than 1.96, H1 is then accepted, meaning that the reproduction management of beef cow parent affects significantly on the reproduction efficiency of beef cow parent.

CONCLUSION AND SUGGESTIONS

Breeders' skills on reproduction management of beef cows is categorized into "fair" indicated by their knowledge which is categorized into "fairly know", their attitude on Upsus Siwab program which is categorized into "agree", and their skills on the implementation of reproduction management which is categorized into "sometimes".

Inseminators' skills on AI technique is categorized into "high" indicated by their knowledge which is categorized into "know", their attitude on AI which is categorized into "agree", and their skills on AI technique which is categorized into "capable" and "always".

The value of service per conception is 50.9% categorized into "less fertile", 47.3% categorized into "normal", and 1.8% categorized into "normal". Moreover, the value of calving rate is dominated in the category of "very good" with 98.2% and the value of calving interval is in the category of "optimal" with 100%.

Breeders' skills on reproduction management affect the reproduction efficiency of beef cow parent significantly.

Suggestions:

- Further study on the effect of breeders' characteristics on the skills of reproduction management of beef cows should be conducted so that the result can be used by the government as the reference in running a technical guide for breeders;
- The use of information technology by breeders to increase knowledge on caring and beef cows' reproduction management should be increased;
- The involvement of breeders in socialization and evaluation of Upsus Siwab program as well as technical guide on beef cows' reproduction management should be increased.

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