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Research Paper

Estimated Economic Losses Due To the Abnormality of Interval Calving In Pasundan Breeding

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ABSTRACT: *One hundred Pasundan cows that have been parted 6 times belonging to breeders belonging to the Rundayan Sawargi Group, Cibalong District, Garut Regency, were used in this study with the aim of knowing the Pasundan cattle calving interval and analyzing the estimated economic losses of the Pasundan cattle breeding business due to the abnormalities of the calving interval of the collection. samples and observations using survey methods. The analysis model used is the analysis of costs, revenues, and revenues, as well as economic losses. The results of this study indicate that the number of calving intervals for Pasundan cows in the study area varied from 12-17 months, the service per conception (S / C) ranged from 1.22 - 1.52, and the blank period of 3-8 months each. Pasundan cows with abnormal calving intervals (>13 months) show the estimated economic loss with the lowest loss difference value for each Pasundan cow of Rp. 5,215,737, - parent per 6 years. The longer the calving interval for Pasundan cows, the higher the estimated economic loss experienced by the breeders.*

KATA KUNCI: *estimated economic losses, calving rate, Pasundan cows*

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I. INTRODUCTION

Pasundan cattle as a typical West Java cattle breed have an important role in meeting food needs and welfare for the community and the environment. The beef cattle industry is a biological industry and breeding is a factory that produces calves (Suryana, 2009). Pasundan cattle agribusiness patterns are mostly carried out by small breeders by providing dominant feed such as natural grass (Indrijani et al 2012). In essence, the ultimate goal of the beef cattle business is to obtain optimal benefits (Rasali et al., 2013). Breeders raise Pasundan cattle by grazing them on plantation and forestry land. so that it can save production costs. Pasundan cattle breeding is profitable for farmers because it does not count labor, there are no forage costs because most of them use agricultural waste. One of the problems with not optimal population development of Pasundan cattle is due to the relatively incomplete reproduction process of Pasundan cattle such as not yet ideal calving interval (13-15 months), which is due to the contraction of various factors that influence the pregnancy process until the child is born safely (Setiawati et al., 2018). Calving interval is the time required for a number of cows from the first birth to the next (Triwulanningsih et al., 2009). A good calving interval is 13 months (range 12-14 months) with pregnancy rates of 95% and S / C approaching 1.00 (Hafez, 2000).

Time calving interval describes the ability of the cows to produce calves in a measure of time. Factors that influence childbearing distance are postpartum estrus (PPE), postpartum mating (PPM), and S / C (Winarti and Supriyadi, 2010). The longer the PPE and PPM and the higher the S / C value, the longer the calving distance will be. In ideal conditions with good maintenance management, birth spacing can be shortened to 12-14 months with a calving rate of 70-90% (Diwyanto, 2015). Delivery distance is influenced by postpartum mating, length of pregnancy, and S / C, where 12 months of birth is the best time economically. According to Diwyanto et al., (2009), the length of delivery is more influenced by post-partum anesthesia and days open, although in general there is a tendency for high S / C to cause long distance between children. Long calving spacing is an obstacle to the productivity inefficiency of beef cattle in Indonesia (Winugroho, 2002), the main cause of which is the delay in the first estrus after giving birth. The longer the calving interval will be associated with a decrease in the income received by farmers. This decrease is due to production costs, the risk of culling at a relatively cheaper price because it is based on live weight/carcass, and the cost of buying heifers at high prices as a substitute for rejected cattle (De Vries, 2006).

Based on the background and existing problems, it is necessary to research to see what the estimated economic losses are due to the abnormal calving interval experienced by Pasundan cattle breeders. This study aims to determine the performance of the Pasundan cattle calving interval and to analyze the estimated economic losses of the Pasundan cattle breeding business due to the abnormalities of the calving interval.

II. MATERIAL AND METHODS

The research material was 100 Pasundan cows who gave birth to 5 times, aged 8-9 years with the same relative weight, belonging to breeders who are members of the Rundayan Sawargi Group in Cibalong District, Garut Regency. The research was conducted with a survey method through direct observation and monitoring which was determined based on purposive random sampling. This research is descriptive research with a qualitative approach. Cows selected as samples are Pasundan cows who have given birth to 5 times, aged between 8-9 years, weighing 250 - 300 kg, belonging to breeders who are members of the Rundayan Sawargi Group in Cibalong District, Garut Regency. Evaluation of reproductive characteristics is carried out using a questionnaire equipped with a structured list of questions aimed at breeders. To obtain further information, an in-depth interview was conducted (in-depth study) with several key informants (inseminator officers). The measured variables are 1). service per conception, S / C), 2) conception rate (CR), 3) calving rate, 4). post partus estrus, 5.) post partus mating, 6). days open (DO) and 7) and calving interval. The reproduction performance data obtained were analyzed descriptively in the form of the mean and standard deviation of each observed variable.

A. Cost, Revenue and Income Analysis

Cost

The cost of each brood is calculated per year, the cost component calculated in the study is only variable costs that are directly related to reproductive performance as follows:

1. AI and Keswan service fee (X1), the unit used is Rp / year.
2. The cost of feed which consists of forage (X2), the unit used is Rp / year.

Based on this, the equation for calculating the cost for each Pasundan cows is as follows.

$TC = TFC+TVC$

$TC = VC$

$= \sum X_i Hx_i$

$= (X_1 Hx_1) + (X_2 Hx_2)$

Information:

TC = Costs calculated in the study (IDR / year)

VC = Variable costs directly related to reproductive performance (IDR / year)

Xi = Number of variable inputs issued consisting of AI and Keswan services (X1) = (frequency S / C / year), (Forage (X2) (Kg / year)

Hxi = Variable input price issued which consists of AI and Animal Health Services (Rp / frequency S / C) and feed (forage) (Rp / Kg).

Revenue

Revenue that are directly related to the reproductive performance of calves while feces and cows are assumed to be fixed and not included in the calculation. The following is the acceptance of each Pasundan cow which is assumed to change due to the abnormality of the calving interval. Calves (Y) are calves produced by female cows, which are assessed at the time of weaning off (age 4 months), calculated based on the number of calves (tails) multiplied by the selling price (Rp). The unit for receiving calves is Rp / year. Revenue for each Pasundan cow is calculated annually and is projected for 3 years of livestock productive life. The equation for calculating revenue per broodstock is as follows:

$TR = \sum YiHyi$

TR = total revenue received by farmers from sales of products/output (IDR / year)

Yi = Ith product of calves (Y) (calves / year)

Hyi = Price of each calf product (IDR calf/head)

Income

Income is the amount of rupiah obtained from the net income of a business (Prawirokusumo, 1990). The formula used is:

$$\pi = TR - TC$$

Information:

π = Income (Rp / 6 years)

TR = Total revenues (IDR / 6 years) TC = Total costs (IDR / 6 years.

The calculation is based on analysis for seven years or about 5 deliveries with the following assumptions:
1. Cows will be raised for a minimum of seven years.
2. The calving interval of the recording results will repeat the same as the next period.
3. The use of other inputs outside of the variable cost component that has a direct effect on reproductive performance (AI and health services and feed) has not changed.
4. Sales of cows and feces have not changed.

B. Estimation of Economic Losses

Estimated economic loss is the difference between the farmer's income in the ideal breed interval (πi) and the farmer's income in the actual calving interval (πa), where the equation can be derived as follows:

$A = \Delta\pi$

$A = \pi a - \pi$

Information:

L = Potential financial loss (Loss)

$\Delta\pi$ = Difference in farmer's income

πa = farmer's income in the actual birth interval (> 13 months)

πi = Farmer's income at the ideal calving interval (13 months)

III. RESULTS AND DISCUSSION

Reproductive Performance

Pasundan cattle reproductive performance was analyzed using descriptive quantitative statistical analysis, which is a factor that determines the number of livestock births. The frequency of calving can affect the production during the productive life of the cows, while to assess the reproductive success of Pasundan cattle, it can be seen from the length or shortness of the calving intervals achieved. Descriptions of the objective conditions of reproductive performance are presented in Table 1.

Table. 1 Calving Interval, Service Perconception Average, Day-Open Average

No	Number of Samples (Head)	Calving Interval (month)	Service perconception (x)	Day-Open (month)	Calf weight off weaning (Kg)
1	21	12	1.22	3	78 ± 8.0
2	38	13	1.28	4	78 ± 8.0
3	24	14	1.30	5	78 ± 8.0
4	10	1.5	1.32	6	78 ± 8.0
5	5	1.6	1.48	7	78 ± 8.0
6	2	1.7	1.52	8	78 ± 8.0

The results in Table 1, show that the mean service per conception (S / C), day open and calving intervals are 1.3 ± 0.1 times, respectively; 4.0 ± 1.0 months; 13.0 ± 1.0 months. This condition shows that the reproductive performance of Pasundan cattle is still by the target set by the Directorate General of Animal Husbandry and Animal Health (2017), stating that to achieve self-sufficiency in meat by 2019, through UPSUS SIWAB, service per conception (S / C) is average. - average 1.5 and calving interval (CI) <14 months, day-open: 90-100 days and the pregnancy rate (CR) reaches 70%. The value of Service Perception (S / C) describes the fertility level of female cows, the lower the S / C value, the higher the fertility of the cows in the group, conversely, if the S / C value is higher, the fertility level of the cows in the group is getting lower (Anggraeni et al., 2010). Furthermore, Arifin, J. (2009) stated that the day open (DO) is the length of time the mother takes from childbirth to become pregnant again or the postpartum period until she becomes pregnant again. Normally 2 times of estrus ± 60 days (birth + 20 days (estrus 1) + 20 days (estrus 2) + 20 days) then AI is done. DO standards are 60-90 days or ranging from 80-85 days so that reproduction becomes efficient after giving birth (Atabany et al., 2011). The birth interval is the time between two consecutive births. Time CI describes the ability of the cows to produce calves in a measure of time. Factors that affect childbearing distance are postpartum estrus (PPE), postpartum mating (PPM), and S / C (Winarti and Supriyadi, 2010). The longer the PPE and PPM and the higher the S / C value, the longer the calving distance will be. In ideal conditions with good maintenance management, 12 months of birth is the best time economically (Diwyanto, 2015).

Cost, Revenue and Income Analysis

Analysis of costs, revenues, and income in beef cattle breeding are highly dependent on the reproductive efficiency of each cow (Priyanto, 2011). This is because the survival of calves depends on the success of the mother to produce several healthy calves when weaned in one reproductive cycle, from mating, pregnancy, birth to weaning (Diwyanto, 2015. indirectly the increase in maintenance costs, animal feed, artificial insemination (AI) service costs, and animal health, while the cost of revenue is still obtained from the weaning weight and selling price (Pramono et al., 2008). For cows with abnormal calving intervals, it will

increase losses to the farmer. In general, the longer the calving interval, the lower the income received by the farmer (Budinuryanto et al., 2011). The calculation results of costs, revenues, and income are presented in Table 2.

Table. 2 Costs, Revenues, and Revenues for 6 (six) Years

No	Calving Inteval	Total Costs	Total Revenues	Total Income
1	12	15.508.008	26.055.000	10.546.992
2	13	15.608.100,	24.384.807	8.776.707
3	14	16.008.100,	22.953.214	6.545.214
4	1.5	16.408.000,	21.712.500	5.504.500
5	1.6	16.908.000,	20.626.000	3.318.000
6	1.7	17.308.000,	19.668.970	3.560.970

Based on the results in Table 2, shows that the lowest total cost incurred by breeders occurred in Pasundan cows which had a 12 month calving interval, namely Rp. 15,508,008, - while the highest cost occurred for cows that experienced a 17 month calving interval, namely Rp. 17,308,000. The variable costs are costs that are directly related to reproductive performance, such as artificial insemination service costs (AI) and animal health (X1), forage costs (X2). Costs are calculated into one year and then projected for 6 years. The cost of artificial insemination and animal health services for cows with a birth interval of> 13 months is generally an increase in the number of costs incurred by mothers who have a birth interval of 13 months. For the mother who failed to become pregnant, the parent must be remarried and increase the service preconception frequency (S / C). The high frequency of S / C causes an increase in the cost of artificial insemination and animal health services. Thus, the longer the calving interval, the higher the costs incurred.

Receipts that are directly related to reproductive performance are calves, while feces and cows are assumed to be fixed and are not included in the calculation. Revenue from the Pasundan cattle breeding business is obtained from the sale of calves. Income is obtained from the total revenue minus the total cost received by the farmer. The parent income with 13 months of birth is relatively stable. Meanwhile, parent income with> 13 months of birth in the following years tended to decline. The income received by breeders from Pasundan cows with a 12 month calving interval has the highest income of Rp. 10,546,992, - and the lowest was received by breeders from cows with a 17 month calving interval of Rp. 3,560,970, -. The results in this study indicate that the longer the calving interval, the lower the income received by farmers.

Economic Estimates Due to Abnormal Calving Intervals

Losses are the differences between revenues and costs when costs exceed costs received (Sukirno, 2008). The term economic loss estimation in this study is the amount of loss of income resulting from abnormalities between childbirth. Meanwhile, to see how big the economic loss is, there must be a standard calving interval so that the difference between the income from each variation in the birth interval can be measured (Arfa'i. 2009). The 13 month delivery rate is used as the ideal standard for the delivery interval. This refers to the opinion of Hafez (2000) which states that a good calving interval is 12-14 months (mean 13 months). Furthermore, Rusdiana et al. (2012) stated that economic losses are calculated by the difference between the farmer's actual income (between 13 months of birth) and the ideal income (13 months of a birth interval). Estimated economic losses are calculated based on the farmer's actual income (birth interval> 13 months) minus the ideal income (birth interval of 13 months) (Riszqina et al., 2011). The estimated economic losses for Pasundan cattle are presented in Table 3.

Tabel 3. Economic Estimates Due to Abnormal Calving Intervals

No	Calving Inteval	Actual Income	Standart Income	Estimated Loss
1	12	10.546.992	8.776.707	-
2	13	8.776.707	8.776.707	0.0
3	14	6.545.214	8.776.707	2.231.493
4	1.5	5.504.500	8.776.707	3.272.207
5	1.6	3.318.000	8.776.707	5.458.707
6	1.7	3.560.970	8.776.707	5.215.737

Based on Table 3. the longer the calving interval, the lower the actual income. This is due to the increase in input costs incurred as the day-open increases. Each additional day-open time will be followed by an additional fee. When Pasundan cows with longer calving intervals (> 13 months) will have an impact on the lower productivity value of the broodstock caused by: (1). The number of calves produced is less. (2) the high

cost of artificial insemination services and health services. Thus, the longer the calving interval, the lower the actual profit, as the input costs get higher. Pasundan cows with 17 months of calving interval have the highest estimated economic loss of Rp. 5,215,737, - while cows with a birth interval of 14 months had the lowest loss of Rp. 2,231,493, -.

IV. CONCLUSIONS

The reproductive performance of Pasundan cattle includes service per conception (1.3 ± 0.1 times), day - open (4.0 ± 1.0 months), and calving interval (13.0 ± 1.0 months). The longer the calving interval, the lower the income received by the farmer and the higher the estimated economic loss. Breeders should immediately have their Pasundan cows checked with an S / C number> 2.0 and a calving interval of> 15 months, in order to minimize losses.

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