Study of Calving Interval (CI) and Postpartum Estrus (EPP) in Beef Cattle Based on Recording Status and Breed Factors

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ABSTRACT

A good reproductive performance will have an effect on increasing the efficiency of beef cattle production. That factors include genetics and management. This study was to determine the causes of CI and EPP its longer than normal. Its 205 beef cattle were used, with normal estrus, good health conditions and traditional management breeding systems. Furthermore, it was divided into two research series, first based on breed, and second on recording status, the parameters data had taken were CI and EPP. The research was conducted by observing and interviewing with breeders and collecting data from the farmer and conducted for 2 months. The results indicate that the age and breed factors do not show a significant difference between groups, while the recording status factor showed a significant difference between complete data and incomplete groups and no recording groups. From these results, it can be seen that the management factor affects the production performance of beef cattle compared to breed factors as genetic factors.

Keywords: CI; EPP; breed; management; beef cattle

INTRODUCTION

The problem of failure of the beef cattle development program in Indonesia is the inefficiency of maintenance management. The recording system for community livestock groups is still not good, the system for selecting livestock by age and analysis of its efficiency and breed problems associated with breeding management. After giving birth, all females go through a period in which they do not experience estrous cycles; this is known as postpartum anestrus. This period of temporary infertility cannot be avoided, but it can be managed to ensure that the cows return to a fertile state in a timely and economically efficient way. Postpartum anestrus is a result of several factors related to pregnancy and calving (1).

The calving interval is the major parameter used to assess bovine reproductive efficiency. In developing countries like Indonesia, the issue of post-partum estrus is important, because it involves the economy of the traditional farmer. Shortening free time can reduce inefficient production costs, meaning that it will increase the income of farmers.

In general, a calving interval of about 1 year is considered economically optimal for beef cows Reproductive performance is one of the most important factors determining the profitability of dairy herds. Profitability and longevity of the beef cattle in such as the replacement costs, breeding costs, and expenses for veterinary treatment and drugs. The biological possibility of a new conception at this time after parturition is based on a coordinated working together of the hypothalamus, pituitary, ovaries, and uterus, resulting in an excellent uterine involution and an early resumption of ovarian function (3).

Furthermore, recording in herd breeding management is essential in determining the appropriate management plan based on data and not just assumptions. Recording in Indonesia is broadly divided into 3 groups, good recording and updating, have a recording system but not updating and no recording at all. Good data will provide complete and accurate information, so data is very important to use in the management system and affects reproduction performance (4). Moreover, Cross-breeding has become a popular thing in Indonesia at this time, the desire to get a faster income, causing breeders to sometimes forget about the negative effect of crossbreeds breeding. Research on crossbreeds breeding has been done a lot, but in Indonesia, the calving interval study base on crossbreed affect has not been complete yet, especially the postpartum study [5,6] Other factors that are also important in beef cattle management are age management, when are the beef cattle still productive and not, and the culling mechanism greatly affects the efficiency of their maintenance [7]. A previous study showed a significant positive correlation between age and non-return rate, but not between age and submission rate, although submission rate also tended to be higher in older cattle, moreover age also has an effect on calving and parity [7,8].

In this case, a coordinated management approach involving farmers and veterinarians is required to obtain high reproduction efficiency in beef cows. [2]. We try to answer all these problems with this study, some differences in opinion and the very little scientific information in Indonesia encourage us to do research with a special study on postpartum beef cattle.

MATERIAL AND METHOD

In this research, 205 beef cattle were used, normal estrus, good health conditions and traditional management breeding systems. The research region was in the Special Region of Yogyakarta. Furthermore, it was divided into three research series, first based on breed, and second on recording status, the parameters data had taken were CI and EPP. The research was conducted by observing and interviews with breeders and collecting data from the farmer and conducted for 2 months. The data were collected from the livestock identity card that contained information about the owner's name, owner's address, type of cow, age of cow, cattle card, Artificial Insemination card (AI), AI frequency, and animal status.

The cows were chosen with the criteria of female PO, SimPO, and LimPO cows, aged 2 to more than 8 years old, and had given birth at least 1 time. The data were analyzed descriptively and statistically with One-Way ANOVA tests used the SPSS program.

RESULT AND DISCUSSION

The results of our research on reproductive performance included Calving Interval (CI) and Estrus Post-Partum (EPP) from different cattle card statuses in the Special Region of Yogyakarta were presented in Table 1.

TABLE 1: Effect of recording status on cows on EPP and CI in Yogyakarta beef cattle group

Recording Status	Samples	EPP (Days)	CI (Month)
Good Recorded	45	67±0,7	16±3,3
Poor Recorded	18	98±2,8	18±4,2
Non Recorded	7	99±3,5	18±5,7

Results of estrus postpartum based on recording status (Good, Poor, Non-Recorded) were 67±0,7 days; 98±2,8 days; 99±3,5 days, while the Calving intervals were 16±3,3 months; 18±4,2 months; 18±5,7 month.

Based on ANOVA statistical analysis, cattle cards with good recording have a significantly different ($P<0,05$) EPP and CI.

TABLE 2: Effect of breed on cows on EPP and CI in Yogyakarta beef cattle group

Breed	Samples	EPP (Days)	CI (Month)
PO	45	4,20±1,67	15,93±3,16
SimPO	25	4,28±1,38	17,20±3,02
LimPO	15	5,12±1,22	15,67±3,12

The results of EPP based on the breeds (PO, SimPO, and LimPO) were 4,20±1,67 months; 4,28±1,38 months; 5,12±1,22 months, while the CI were 15,93±3,16 months; 17,20±3,02 months; 415,67±3,12 months. Based on the One-Way ANOVA statistical test, there were not significantly different ($P>0.05$) of EPP and CI from the three breeds groups.

Cattle card or recording performance is an important component in the breeding cattle farm. Performance recording in beef cattle even in countries with advanced beef industries has not attained the same degree of uniformity and refinement as that of the dairy industry. This is due to the diversity of environments and management systems under which beef cattle are raised and the different production systems used for beef production. The management systems under which beef animals are maintained in the tropics are even more variable. With the exception of the small proportion of cattle kept in commercial ranches, the majority of cattle are raised under extensive systems and are not accessible for recording. [9]

Peranakan Ongole (PO) derived from the uncontrolled crossing between Sumba Ongole cattle with local cattle in Java since the 1930s. PO cattle are a tropical species that have adapted in Indonesia, especially in East Java. Since the 1990s, many PO cattle crossed with taurine cattle, mainly Simmental and Limousin, through artificial insemination without considering the genetic composition of descendant, so it is feared that it will affect their adaptation, reproduction, and growth. PO cattle are known as beef cattle and draught cattle. They are suitable as draught animals due to a big and strong body, docile and quiet, tolerant to heat, have high adaptability over different environmental conditions, able to grow in limited forage conditions, and high reproductive activity.

The female quickly returned to a normal condition after giving birth. However, the percentage of a carcass is generally lower than other Indonesian local cattle. [10]

Limpo (Limousin x PO) and Simpo (Simmental x PO) cattle are widespread across Java, in the lowlands and highlands. PO cattle's first mating age is higher than Limpo cattle's. In the highlands, service per conception (S/C) is higher for Limpo and there was no significant difference for open days period (DO) and calving interval period (CI), making it both more efficient to be maintained in the lowlands. Environmental conditions and the breeds of cattle affect calving interval period and first mating [11]. Cattle species and the average daily temperature resulted in a different interval between calving and mating. This interval is longer in the dry season than the wet season, probably because of the low quantity and quality of feed during the dry season which result of low BCS (body condition score) [12]. Service per conception ranged from 1.64 to 2.01 is affected more by climate than by species of cattle that in a tropical climate it shows higher service per conception [12]. Limpo cattle containing genetic of zebu and taurine cattle show high service per conception [11]. The period of open days and calving interval was not significantly influenced by the breeds of cattle and environmental conditions [11]. Performance of reproduction based on the reproduction cycle (first mating after calving, service per conception, open days and calving interval) of PO cattle is more efficient than Limpo. Altitude and breeds of cattle affect the age of first mating and first calving, the first mating after calving and the number of services per conception, but not on open days and calving interval. Based on the reproduction performance, PO cattle and Limpo cattle are more efficient to be raised in the lowlands than highlands [11].

The result of the research based on table 1, cows with good cattle card recording have shorter EPP and CI than cows

with poor and non-cattle card recording. From these results, it can be seen that the management factor affects the production performance of beef cattle compared to breed and age factors as genetic factors. The recording system is one of the factors in the beef cattle reproductive management. A recording system, can be used to analyze farm problems, especially reproductive problems, and give any solution to solve the problem which directly impacts can improvement livestock productivity and increase cattle population (13).

The result of the research based on Table 2, cows with various breed (PO, SimPO, LimPO, do not have different of EPP and CI. From these result, it can be seen that the breed factor has not affect on the reproductive performance of beef cattle, but management factor has affected on reproductive performance. The success of breeding program, influenced by breeder performance (Management) and cows body condition score [14]. Low BCS at calving and postpartum BCS loss negatively impacted percentage of pregnant females to TAI, with primiparous cows being the most sensitive to the effects of low BCS during the postpartum period [15]. Management factor affected in calving interval and EPP such as heat detection, reproductive health, nutrition, and housing management. Heat detection, the single most important factor affecting reproductive efficiency, is one of the major management problems in our dairy herds. In most case, visual detection of estrus lacks accuracy and thoroughness. The reliance on simple workers, with less specialized dairying skills and not motivated and supervised often results in heat detection errors. Common errors include identification, diagnosis and inadequate or inaccurate estrus detection, especially if either is combined with reduced inseminating competence, can prolong interval from calving to conception and increase culling due to infertility [16]. Many specific reproductive health problems, such as, the true anoestrus, ovarian cysts, abnormalities of the puerperium, retained placenta and metritis are quite common in dairy herds. They require a good reproductive health program, which is essential for efficient reproduction not only because it generates data necessary for breeding management, but it also allows for checking normal uterine involution and return of ovarian cyclicity. Unfortunately, this type of program is lacking in many herds where veterinarians are usually called on an emergency basis [16]. Nutrition often directly affects reproductive capabilities. Calving intervals in excess of 12 months are often caused by nutritional stress (deficiency) at some point, either before the calving season or during the subsequent breeding season, which results in thin body condition and poor reproductive performance. The number one nutritional reason for poor reproductive performance is the lack of energy. Energy deficiency, particularly in postpartum cows, is most likely the major feeding factor involved in poor reproductive performance of dairy herds in Tunisia. It results from the feeding of poor-quality forages, which in most cases, is coupled with inadequate supplementation. The end result is that follicular growth and development leading to first ovulation are affected and that cows in most negative energy balance are more likely to remain anoestrus [17]. Housing arrangement, concrete floors without adequate bedding and feet and leg problems are other factors associated with lowered detection of heat and reduced fertility in our herds. Cows do not have enough space to interact with their herd mates once on heat, making detection more difficult. In many cases we have seen slippery floors in our barns without bedding because straw shortage. The excessive (more than60% of the total ration on a dry matter basis) use of concentrate feeds in the ration of lactating cows along with the prevalence of concrete floors increase the frequency of cows with sore feet among our herds.

These cows dislike being mounted on coarse floors. They will exhibit fewer stands resulting in poor heat detection. Consequently, they will have significantly longer calving to service and calving to conception intervals. Research showed that mounting activity was reduced by almost the half when cows were left on concrete as opposite to softer floors while the duration of anoestrus activity was reduced by 25% [16].

CONCLUSION

Based on these results, we conclude that PO, SimPO, LimPO cows in livestock group around Special Region of Yogyakarta do not have different on the reproductive performance. Good recording status have reproductive performance relative good than poor and non-recording status.

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