

**CURRENT STATUS OF POSTPARTUM ANESTRUS INTERVAL OF PERANAKAN
ONGOLE COWS IN DRY LAND AREAS OF EAST JAVA
IN RELATION TO FEED SUPPLY**

M. Ali Yusran, Teguh Purwanto, Bambang Suryanto, Sugiyane M.P., and Bambang Sudarmadi

ABSTRACT

Current status of postpartum anestrus (PPA) should be evaluated in order to decide suitable supplement required. Feed supply in dry land areas of East Java was estimated with regards of PPA status of Peranakan Ongole (PO) cows. The observation was one year and locations were Blitar, Lumajang, and Malang areas (upland), and Tuban, Pasuruan, and Probolinggo areas (low land). Feed ingredients were similar in wet season (middle to the end of wet season) for either district. However, cereal straws become dominant during the dry season (middle dry season to early wet season). It showed that crude protein (CP) supply only met 56 to 65% of the CP required by lactating cows. Combination of lack of CP supply and late weaning practice might had contributed to a long PPA (more than 3 month) in cows.

Key words: Dry land, Feed supply, Postpartum anestrus, PO cows

INTRODUCTION

Beef produced in Indonesia is believed that it comes largely from smallholder farms; particularly in East Java. It is important therefore, that program to increase beef production in East Java should pay attention on beef cattle rearing under smallholder farms condition. Komarudin-Ma'sum and Teleni (1991) have informed that the majority of these cattle are Peranakan Ongole (PO).

Although there are three agroclimatic categories in East Java; the dominant categories are the dry agroclimatic (Komarudin-Ma'sum *et al.*, 1993). It is consistent with dryland agricultural regions which also dominant in East Java (Basyir, 1994).

Improving reproductive performance of PO cows in the context of smallholder farms in East Java is very urgent to be conducted in order to Natural Increase of PO cattle will increase. Finally, not only beef supply capacity in this province will increase, but also the farmers' income.

The reproductive performance of cows is a very complex phenomenon and many factors play role in determining production level. Nutritional status is one of these (Branton, 1970). Nutrition intake

related to feed intake is probably the most important factor under smallholder farms condition in East Java, especially in dry land agroecosystem areas.

In these areas, the feed intake of PO cows depends on fodder supply from their owners or cattlemen, because the feeding management system which conducted is cut and carry system (Komarudin-Ma'sum *et al.*, 1993).

A particular problem with fodder supply in the context of smallholder farms is its high variability, both in quality and quantity (Thahar and Mahyuddin, 1993). Such condition is a consequence from the feeding system which rely on fodder production from fallow and grazing lands, farms border strips, road sides and public lands, and also from crop residues. While arrangement mating and calving cows, which adjusted to feed availability fluctuation is not known by farmers. As the result, farmers' cows calved both on abundance and on shortage feed periods; and it is predicted that reproductive performance of PO cattle also would fluctuate.

One of the important traits of reproductive performance is postpartum anoestrus (PPA) interval that it is effected by nutrition status of the lactating cows.

Therefore, this study looked into connection between current feed supply and PPA interval fluctuations distributed in season parts on PO cows under smallholder farms in the dry land areas of East Java. The study provided some baseline information that will be helpful to take proper strategy for increasing reproduction performance of PO cows through improving feeding and mating and/or calving management strategies.

MATERIALS AND METHODS

A total of 96 calving of PO beef cows belong to farmers in the selected village research sites were surveyed for studying the relationship between postpartum anoestrus (PPA) interval and feed supply over one year period (1995/1996). Of these animals, 31 cows and 65 cows, respectively, were maintained on research sites located in up-land altitude (600-700 m asl.) which were represented by some villages in Kabupaten Blitar, Lumajang, and Malang, and in low-land altitude (± 4 m asl.) which were represented by some villages in Kabupaten Tuban, Pasuruan, and Probolinggo. Both village research site groups are included in dry land agricultural regions.

Over a one year period of this study have been divided into three parts of the seasons, that are (A) from the middle to end of rainy season (February - May); (B) on beginning of dry season (June-July); and (C) from the middle of dry to beginning of rainy season (August - Jan).

In each part seasons, the sample cows were recorded on their feed supply and PPA interval. Feed supply was recorded in once week interval during postpartum anoestrus period; and then, it's been expressed into dry matter (DM) and crude protein (CP). PPA interval was determined with according to number of days from parturition to first estrus after calving that it was based on visual behavioral estrus observation.

Data were analyzed with description analysis and variance analysis of nested classification.

RESULTS AND DISCUSSION

Availability of fodder is a limiting factor to cattle productivity in densely populated areas such as in East Java. Due to fodder are largely obtained from useless lands for food agriculture so availability of fodder is a markedly seasonal fluctuation. This assertion is supported by the result of this research. Almost all farmers surveyed stated that variability of the diet of their cows is not determined by physiology status of the cows.

On the other hand, the farmers did not differentiate the diet for their cows amongst cows nursing calves, pregnant cows, dry pregnant cows, and other conditions, but only it is more determined by availability of fodder production which related to seasons (Table 1). In addition, rice bran and other concentrates are not normally fed to PO cows. Cows are nearly all hand-fed throughout the year, and are seldom grazed.

Table 1 show the composition of the diet fed to PO cows in village research sites under dry land agroecosystem in up-land and in low-land areas. There were markedly differences in the composition of the diet due to different seasons, especially between over the middle to the end of rainy season and the middle of dry to the beginning of rainy season, either in up-land or low-land areas. During the beginning of dry season could be stated as the transition period.

Both in up-land and in low-land areas, There were few variations of the composition of the diet and bulked with field grasses over the middle to the end of rainy season, whereas the case over the middle of dry to the beginning of rainy season was a lot of variations, and the percentage portion of rice-straw and maize straw in dry condition in the diet increased.

Implication of those, dry matter (DM) in the diet offered in up-land areas tends to increase from the middle to the end of rainy season period to the middle of dry to the beginning of rainy season period; i.e. 7.2 to 8.4 kg/day/cow unit, whereas relatively constant is the case in low-land areas. In the contrary, the percentage of crude protein (CP) content of the diet decreased over the same time, both in up-land and low-land areas

Table 1. Annually current feed supply in commonly in villages, both in up-land and low-land areas

Altitude/Nutrition supply/Feedstuff	Season		
	the middle to the end of rainy season (Jan.- Apr)	the beginning of dry season (May - July)	the middle of dry to the beginning of rainy season (Agst.- Nop.)
<i>Up-land areas</i>			
	<i>(in average)</i>		
- Dm supply(kg/day/cow unit)	7.2	7.3	8.4
- % CP of DM supply	9.09	8.14	7.62
- Composition of feedstuffs (%)			
- Field grasses	55	21	32
- Elephant grass	18	11	15
- Rice straw (wet)	23	38	11
- Rice straw (dry1)	-	9	13
- Maize straw (wet)	2	9	3
- Maize straw (dry)	-	-	14
- Soybean hay	-	-	2
- Others*	2	12	10
<i>Low-land areas</i>			
- Dm supply(kg/day/cow unit)	8.1	8.3	8.3
- % CP of DM supply	8.08	7.50	6.76
- Composition of feedstuffs (%)			
- Field grasses	48	21	13
- Elephant grass	5	-	3
- Rice straw (wet)	20	-	-
- Rice straw (dry1)	18	42	33
- Maize straw (wet)	6	32	12
- Maize straw (dry)	-	-	20
- Soybean hay	3	-	13
- Others*	-	5	6

* e.g Gliricidia, Leucaena, Calliandra, Sesbania, etc.

**e.g Hybiscus spp., Dolychos lab lab, etc.

(Table 1).

Nevertheless, as presented in Figure 1, in up-land areas the amount of the daily DM offered for postpartum cows was showed still lower than minimum cows' requirement for DM (average of live weight is 300 kg) as recommended by NRC (1976) adopted by Church (1979) except over the middle of dry to the beginning of rainy season. But, in low-land areas the amount of those during the wet and dry season was enough for meeting their requirement for DM. In Figure 1 also showed that the amount of the daily CP supplied for PO cows nursing calves over the first 3-4

months postpartum was not sufficient to meet protein requirement of the cows, either on "abundance feed" period or "shortage feed" period. Similar results also have been reported by Affandhy *et al.*, (1992) on Madura cows (other breed of beef cattle in East Java) in the other parts of East Java.

Although protein is generally regarded as less important than energy for reproduction, low protein intake can also cause infertility. However, it may be difficult to differentiate the effects of low protein intake from concurrent low energy, because protein deficiency usually leads to decreased

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|------------------------------|---|--|
| : CP supply in upland areas | A | : on the middle to end of rainy season |
| : CP supply in lowland areas | B | : on the beginning of dry season |
| : DM supply in upland areas | C | : on the middle of dry to beginning |
| : DM supply in lowland areas | | rainy season |

Figure 1. The daily supply and requirement (recommended by NRC, 1976) for DM and CP of cows nursing calves over the first 3-4 months postpartum in the village research sites

appetite. Moreover, the CP content of the feed is below 7.5%, which will reduce rumen efficiency and digestibility of the feed. As a result, lactating cows are unable to meet their nutritional requirements so that their ovaries are depressed its activities during lactation, and then causes delayed postpartum oestrus, lowered conception rates, and long calving interval (Church, 1979; Mukasa-Murgewa, 1989).

In spite of lack of CP in the daily diet of their PO cows, farmers have not used shrub/tree legumes intensively for increasing protein content in the diet of their cows, whereas in fact they are aware that these legumes can be fed to cattle. This indicate that more intensive extension and shrub/tree legumes establishment are still necessary to carry out in the central areas of PO cattle in East Java.

These results may give more information for explaining low reproductive performance or calving rate of PO cows under smallholder farms in East Java.

Based on farmers' recall, the pattern of the monthly distribution of 172 calving is shown in Fig. 2. The calving pattern showed that there was not markedly difference in percentage numbers of calving between in January - April and in August - November, either in up-land areas or in low-land areas, viz. the percentage in January - April and August - November are 44% and 28%, respectively, in up-land areas, while on low-land areas that are 41% and 32%, respectively. The data supported evidence that the farmers did not care a mating season for their cows. In other words, calving is able to occur from month to month. However, the average percentage of total cows calved in rainy season in all the villages tends higher than that in dry season.

In such seasonal fluctuation of feed supply, PPA interval of PO cows that distributed on two parts of season under smallholder farms in dry land areas of East Java as results of this research are presented in Table 2.

Figure 2. Distribution of numbers of calves born

In this study, PPA interval did not ($P > .05$) differ between the cows nursing calves on the first 2-3 month postpartum over the rainy season and over dry season, either in up-land and low-land areas. Besides that, difference of altitude areas also did not cause difference in those. The results indicated that variations of nutrition supply occurred between both parts of season (Table 1) did not lead to difference in PPA interval of the cows that calved on the beginning of these periods. Because during both periods, the lactating PO cows under smallholder farms suffered shortage of CP intake (Figure 1).

Postpartum anoestrus interval is an important of concern in relation to the beef breeder cows because the length of which will determine the length of calving intervals. The length of PPA interval shown in Table 2 can be classified as inefficient of PPA interval. Dunn and Moss (1992) have suggested that a cow with a PPA interval of greater than 80 days has less than 65% chance of calving within 365 days (12 months) of previous calving, while a cow with a PPA interval greater than 40 days but less than 80 days has between 65% - 88%

chance of calving within 365 days of previous calving.

Such inefficient of PPA interval are suggested due to not only cows suffered a protein deficiency (and also probably energy) which is associated with a poor nutritional supply (Table 1 and Fig. 1), but also the presence of suckling stimulus from the calf. Branton (1970) and Horta *et al.*, (1988) have stated that the length of the PPA interval is largely a function of the nutritional status of the cow and the suckling stimulus from the calf.

In this study showed that PO cows under smallholder farms system in dry land areas in East Java received feed with CP content between 56% - 65% of the recommended (NRC, 1976) throughout the year (see Fig. 1), and almost all of farmers surveyed stated that their cows will show first oestrus postpartum after weaning time. Generally, the weaning age under smallholder farms system in East Java is between 3 - 7 months.

The report of Treacher *et al.*, (1976) cited by Jordan and Swason (1979) concluded that dairy cows fed 75% of the recommended CP intake had a 40-day

Table 2. Postpartum anoestrus interval of PO cows under small-holders farms in dry land areas in East Java over two parts of seasons ($P > .05$)

Altitude	Part of season	Average of PPA interval (days)**
Upland areas	"A" period*	104.14 ± 46.43
	"C" period*	135.70 ± 50.03
Lowland areas	"A" period*	107.05 ± 29.05
	"C" period*	105.57 ± 43.37
Overall		110.57 ± 39.53

* : "A" period = the middle to the end of rainy season

"C" period = the middle of dry to the beginning of rainy season

** : for the PO cows which calved on the beginning of these periods.

interval between calving and first estrus compared to a 35-day interval in cows fed the recommended CP. While King and Macleod (1984) observed in beef cows have showed that there was not significantly difference in number of days from parturition to first ovulation between cows receiving 70% of calculated energy requirements and cows receiving 100%. Besides that, Eldon *et al.*, (1988) concluded that a negative protein/energy balance can lead to delayed onset of ovarian activity postpartum.

CONCLUSIONS

According to the results of this study have been concluded that under rural condition in the dry land areas of East Java:

1. The composition of the diet of lactating PO cows were markedly fluctuate due to different season, especially between over the middle to the end of rainy season and the middle of dry to the beginning of rainy season, either in up-land or low-land altitude;
2. Crude protein supply only met 56 to 65% of the CP required by lactating PO cows, either during dry or rainy season;
3. Postpartum anoestrus interval of PO cows were not significantly fluctuate due to feed supply fluctuation available which it is related with difference in seasons;

4. Postpartum anoestrus interval of PO cows can be classified as inefficient of PPA interval, *viz.* average of PPA interval was 110.57 ± 39.53 days; and
5. Combination of lack of CP supply and late weaning practice might had contributed to a long PPA (more than 3 month) in PO cows.

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