The 7th International Seminar on Tropical Animal Production
Contribution of Livestock Production on Food Sovereignty in Tropical Countries
September 12-14, Yogyakarta, Indonesia

Intercorrelation of Cow Length Pregnancy, Birth Weight and Sex Ratio of Calves in Madura Cattle

Jauhari Efendy [1] and Peni Wahyu Prihandini[1,2]
[1]Beef Cattle Research Station, JL. Pahlawan No.2 Pasuruan, East Java – Grati 67184
[2]Departement of Breeding and Reproduction, Faculty of Animal Science,
Universitas Gadjah Mada, Yogyakarta, Indonesia
Corresponding author: jauhariefendy67@gmail.com

ABSTRACT

Optimization of beef cattle breeding is a systematic effort to improve productivity and population. The aim of this study is to determine the birth weight and sex ratio of calves and its association with length of pregnancy estrus synchronization program. The research was conducted in Pamekasan district, Madura Island, including three sub-districts; i.e.: Waru, Batumarmar and Pasean from July 2012 until August 2013. The total of 80 cows and their calves were divided into three treatment based on the dose and the type of hormone. The average of length pregnancy of Madura cattle was 287.49 days. For the birth weight in all treatments ranged between 16-20 kg, with an average of 18 kg. Length of pregnancy positively correlated to birth weight and sex of calves with correlation (r) 0.213 and 0.051, respectively. Based on Spearman correlation test, there was not significantly between birth weight and sex ratio of calves in Madura cattle.

Keywords: Madura Cattle, Intercorrelations, Estrus Synchronization

INTRODUCTION

Development of beef cattle business has a good prospect with more and confort climate characterized investment by improving the price of beef cattle at this time. The phenomenon will easy efforts to increasing in beef cattle population as it grows and the expansion of the beef cattle livestock business people through the development scale of beef farming as well as the emergence of new beef farmer.

Indonesia has various forage to contribute significantly to cover the national beef cattle necessary. One of the local beef cattle already prevalent in various parts of Indonesia is the Madura cattle with the largest population on the Madura Island and surrounding areas. Madura cattle is the local Indonesian cattle that the result from a cross between Bali cattle (*Bos sondaicus*) and Java cattle (*Bos indicus*). Furthermore, Madura Cattle is derived from a cross between a bull with cows in Central Java which were then gaining additional blood cattle zebu cattle (*Bos indicus*) even *Bos taurus* although not yet known for certain proportion of blood (Suryoatmodjo, 1993; Ma'sum, 1993). According to Kutsiyah (2012), Madura cattle was formed as a result of isolation of nature and environmental influences, so have the uniformity of characteristics that stand out among the local beef cattle breed in Indonesia.

As one of the region to develop of Madura cattle, Pamekasan is famous for its culture, the Sonok cow and Bull Racing. Both of types the culture has made Madura cattle as the main commodities and became the "Primadona" in particular for lovers and beef farmers or communities in Madura Island. On the other hand, there is a tendency that the Madura cattle especially the Sonok cows some have relatively low reproductive performance that show by

the failure of the pregnace though already mated (either by natural mating or artifisial insemination) is more than three times (Efendy and Mariyono, 2013); so for long time can inhibit the efforts of regeneration the Sonok cows.

One of the strategic steps undertaken to resolve the failure of the pregnance are implement synchronization estrus program besides the repair maintenance management. Moreover, the cows with good conditions could produced the calf every year (Ball and Peters, 2004). The objective of this research was to know the correlation between the birth weight and sex ratio calf with the old pregnancy in estrus synchronization programs.

MATERIALS AND METHODS

This research was carried out at the Pamekasan district in Madura island, East Java province covering three districts; namely, Waru, Batumarmar and Pasean from July 2012 to August 2013. The Material of this research were used 80 tail of Madura cows and their calf where was divided into three treatments based on dosage and or types of hormones. The hormones was used Prostaglandin ($PGF_2\alpha$) and combination with GnRH (ovsynch). The allocation hormones based on dose and type of hormones; namely (A) 2 ml the dose of Prostaglandin hormones are giving two times during observation (the first day and the 12th day); (B) 3 ml the dose of Prostaglandin hormones are giving two times during observation (the first day and the 12th day); and (C) the method of ovsynch, i.e. a combination of Prostaglandins (2 ml dose on day 8) and GnRH (2.5 ml doses are giving two times, i.e. the first day and tenth day). Data for this study were analysed with the correlation of *Spearman* using the software SPSS 17.0.

RESULTS AND DISCUSSION

Cow length pregnancy correlation with birth weight and sex of calf
Length of pregnancy on Madura cattle was calculated based on the start time when mated for the first time with artifisial insemination (AI) until partus. Length of pregnancy on Madura cattle, which was induced by synchronization estrus hormonal at each treatment are presented in Table 1.

Table 1. The result length of pregnancy Madura cattle were synchronized estrus in Pamekasan district

Treatment	n (tail)	Long pregnancy (days)			
		Average	sd	Maximum	Minimum
A	30	286.73	8.29	315	273
B	23	286.78	7.24	307	271
C	27	288.96	7.23	307	278

sd: standard deviation

These results are showed that the average length of pregnancy Madura cattle on the treatment C is relatively longer than A or B treatment. However, based on the results of a statistical analysis that the treatment estrus synchronization hormone did not significant towards the long pregnancy in Madura cattle. The average length of pregnancy in this research are not much different from Prasojo *et al*., (2010) and Devendra *et al*., (1973) on Bali cattle with the length of pregnancy respectively 284.40 and 287 days.

Table 2. The result length of pregnancy and birth weight of Madura cattle

Treatment	n (tail)	270-290 day		> 290 days	
		16-18 kg (tail)	> 18 kg (tail)	16-18 kg (tail)	> 18 kg (tail)
A	30	10	10	3	7
B	23	12	7	1	3
C	27	12	7	2	6
The total number of	80	34	24	6	16

Birth weights of Madura cattle for all treatment ranges between 16 to 20 kg or average 18.35 kg. These results are higher than those obtained by Karnaen and Arifin (2007) that the average birth weight of calf Madura cattle in Bangkalan distric is 17.04 kg. Comparation was based on the length of pregnancy, so the birth weights of calf Madura cattle with the length of pregnancy in 270-290 day is 18.25 ± 1.13 kg; While the length of pregnancy more than 290 days has birth weight 18.64 ± 0.81 kg (Table 2).

The ratio of the birth weights for birth weight 16-18 kg and birth weight more than 18 kg correlated positively with the length of pregnancy (r = 0,213); cows with the length of pregnancy 270-290 day has a ratio of 1.7:1-1; While cows with the length of pregnancy more than 290 days have a ratio of 1:2.3-3.0. Thus, the longer the age pregnancy on Madura cattle, will enlarge the opportunities of gaining birth weight of calf higher. These results are in line with those obtained by Jaenudeen and Hafez (2000) that length of pregnancy could affect the size of foetus in terms of pregnancy initializing; similar opinions were also presented by Anderson and Plum (1965) that the correlation between the length of pregnancy with birth weights ranging from 0.15 to 0.52, so the shorter length of pregnancy will tend to produce a calf with birth weights that are smaller.

Table 3. Length of pregnancy and sex of calf

Treatment	n (tail)	270-290 day			> 290 days		
		Male (tail)	Females (tail)	The ratio of Male-Female	Male (tail)	Females (tail)	The ratio of male-female
A	30	11	9	1.2:1	6	4	1.5:1
B	23	10	10	1.0:1	2	1	2.0:1
C	27	12	7	1.7:1	5	3	1.7:1
The total (tails)	80	33	26	-	13	8	-

The cow with length of pregnancy 270-290 day has percentage sex of calf is relatively balanced i.e. 55.93% males calf and females calf 44.07%; While in the parent with the length of pregnancy of more than 290 days, so the proportion of males calf higher (61,90%) than females calf (38,10%). This indicates that the length of pregnancy correlated positively towards gender of the calf with the correlation value 0.051. These results are the same as the research done by Prasojo et al., (2010) on Bali cattle, that the male calf was obtained from the cow with the length of pregnancy longer than the female calf with the coefficient correlation 0.075.

The correlation of birth weight and sexes of calf

Table 4. Birth Weight and sexes of Madura cattle calf

Treatment	n (tail)	16-18 kg		> 18 kg	
		Male (tail)	Females (tail)	Male (tail)	Females (tail)
A	30	8	7	9	6
B	23	8	4	4	7
C	27	8	6	9	4
The total (tails)	80	24	17	22	17

Based on the *Spearman*t correlation test, there was no correlation between birth weight with sexes calf from the results synchronization of estrus in Madura catlle. These could be seen from the relative proportion of equality (balance) between males calf and females calf on birth weights are different. The proportion of males calf and females calf with a weight range of birth 16-18 kg are 58.54% male calf and 41.46% females calf. Next, The birth weight more than 18 kg have proportion 56.41% for males calf and 43.59% for females calf. Moreover, based on the average of the actual birth weight, the female calves are relatively bigger i.e. 18.37 ± 1.06 kg compared with males calf with birth weights 18.31 ± 1.08 kg.

CONCLUSIONS

Treatment with hormones giving of types and different doses on cow Madura cattle have not correlate positively with the length of pregnancy, birth weight of calf and sexes of the calf. Birth weight and sex have positive correlated with length of pregnancy with the value of the correlation of each are 0.213 and 0.051; whereas birth weight of calf has not correlate positively towards sexes of calf.

REFERENCES

Anderson, H. and T.V. Plum. 1965. Gestation duration and birth weight in cattle and buffaloes. J. Dairy. Sci. 48:1224.

Devendra C.T., K.C. Lee and Pathmasingam. 1973. The productivity of Bali cattle in Malaysia. J. Agric. 49:183-197.

Efendy, J. and Mariyono. 2013. Keberhasilan kebuntingan pada sapi Madura melalui penerapan kawin alam. Proceedings of the National Seminar on animal husbandry and Veterinary Technology – Medan, 3-5 September 2013. ISBN 978-602-1520-33-8. Things: 85-91.

Jainudeen, M.R. and E.S.E. Hafez. 2000. Gestation, prenatal physiology and parturition. In: Hafez ESE, Hafez B, editor. Reproduction in farm animals. : 2nd ed. 7. Lippincott. Williams & Wilkins.

Karnaen and J. Arifin. 2007. Kajian Produktivitas Sapi Madura. Jurnal Ilmu Ternak,, December 2007. 2:135-139.

Kutsiyah, F. 2012. Analisis pembibitan sapi potong di Pulau Madura. Wartazoa. 3: 113-126.

The 7th International Seminar on Tropical Animal Production
Contribution of Livestock Production on Food Sovereignty in Tropical Countries
September 12-14, Yogyakarta, Indonesia

Ma'sum, K. 1993. Hasil-hasil penelitian sapi Madura di Sub Balai Penelitian Ternak Grati, Pasuruan. Pros. Meeting of the results of research and development in Madura Cattle. Sub Balitnak Grati, Sumenep. 3: 45-54.

Prasojo, G., I. Arifiantini dan K. Mohamad. 2010. The correlation between the long pregnancy, birth weights and sexes calf the result of artificial insemination in Bali cattle. The veterinary journal. 1: 41-45.

Surjoatmodjo, m. 1993. Madura cattle origins reviewed the results of the measurements of parts of his body. Pros. Meeting of the results of research and development in Madura Cattle. Sub Balitnak Grati, Sumenep. 86 – 91.

Wawo, A.A., 2014. Pengaruh pejantan terhadap tingkat kebuntingan dan berat lahir pada sapi Bali yang dipelihara secara semi-intensif. Thesis. Faculty of Animal Husbandry Department of Livestock Production-Hasanudin University Macassar.