Oral Presentation (FA-9)

Reproductive Efficiency of Brahman Cross Cattle Using Artificial Insemination with Frozen Semen from Bali, Brahman, Limousin, and Simmental Cattle

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INTRODUCTION

Demand and consumpsion of beef meat increases every year in Indonesia. The increase of demand is not followed by the availability supply of beef cattle production nationaly. Statistical data from Direktorat Jenderal Peternakan Indonesia showed that on the year of 2016 the demand of beef was 604.968 ton and the production of beef was only 354.770 ton. The goverment imported of beef and cattle to fulfill the lack of supply, as of 2016 there was 116.761 ton beef and 1.298.560 cattle imported to Indonesia(1).

Indonesia has determined to achieve beef self–sufficiency by 2024. To achieve that goal the goverment want to increase the cattle population nationaly by requiring the cattle and buffalo farm industry to oblige the breeding programe. The goverment made some policy including Upsus SIWAB and an obligation of the feedloters of imported cattle to do breeding. According to PERMENTAN no 49 thn 2016 and it's add on PERMENTAN no 2 thn 2017, importation of beef cattle must meet the ratio 1:5 between breeding cattle and feeder cattle.

Reproductive efficiency is a parameter used to determine the success of breeding programe. Reproductive eficiency is a measure of the ability if a cow to become pregnant and produce offspring(2). Optimalization of reproductive efficiency can be one of means to increase national cattle population.

Brahman Cross is one of the most common imported cattle breed to Indonesia. Husbandry and reproductive management play an important role to achieve the best result on cattle breeding programe. Feedloters who conduct breeding programe of Brahman Cross cattle (Breedlot) have the capacity and potential to increase the reproductive efficiency of their breeding programe due to they have capital and good management. Thus it is important to assess and measure the reproductive efficiency of Brahman Cross cattle artificially inseminated with frozen semen to increase the reproductive efficiency of beef cattle in the Breedlot.

MATERIALS AND METHODS

The study was done from February 2018 to August 2018. The study was conducted by collecting secondary and primary data from PT. Lembu Jantan Perkasa (LJP), Serang, Province of Banten. The primary data was gathered by onsite observation and discussion with breeding manager of LJP on husbandry and reproductive management.

The secondary data was evaluated from LJP's Breeding Database of 2013 – 2017. The data consist of several records on artificial insemination, pregnancy, partus, and reproductive disorder cases. The total data collected was 1.176 from 2013-2017.

Data analysis. The data was gathered and filtered by the criteria determined for the study (cattle breed is Brahman Cross or the progeny, conception by artificial insemination and the first service is done in that particular year). Then the data was tabulated and analyzed in MS. Excel by formulas

Service per conception (S/C):

$$S/C = \frac{\Sigma\, number\ of\ AI\ services}{\Sigma\, number\ of\ pregnant\ cattle}$$

Conception rate (CR):

$$CR = \frac{\Sigma\, number\ of\ cattle\ pregnant\ by\ the\ 1st\ service}{\Sigma\, number\ of\ cattle\ inseminated}$$

Pregnancy rate (PR):

$$PR = \frac{\Sigma\, number\ of\ pregnant\ cattle}{\Sigma\, number\ of\ cattle\ inseminated}$$

Calving rate :

$$Calving\ rate = \frac{\Sigma\, number\ of\ calf\ born}{\Sigma\, number\ of\ cattle\ inseminated}$$

Calving interval :

$$calving\ Interval = partus\ (i) - partus\ (i\text{-}1)$$

Days open:

$$DO = date\ of\ successful\ AI - date\ of\ prior\ partus$$

The parameters used to determined reproductive efficiency in the study are service per conception (S/C), Conception rate (CR), Pregnancy rate (PR), Calving rate, Calving interval (CI), and Days open (DO).

RESULT AND DISCUSSION

The data of reproductive efficiency of Brahman Cross cattle during breeding program from 2013 until 2017 at PT LJP can be seen in Table1.

Table1. Reproductive efficiency of Brahman Cross cattle artificially inseminated in 2013-2016 at LJP

Year		Total Acceptor	*S/C*	*CR (%)*	*PR (%)*	*Calving Rate (%)*	*Calving Interval (month)*	*DO (month)*
2013	Heifer	112	1.71	59.8	84.8	73.0	-	-
	Cow	91	1.51	72.5	84.6	82.4	14.7	90
	Total (Heifer & Cow)	203	1.62	65.3	84.7	77.2	14.7	90
2014	Heifer	74	1.46	70.3	87.8	78.4	-	-
	Cow	77	1.51	64.9	87.0	79.2	14.4	137
	Total	151	1.48	67.5	87.4	78.8	14.4	137
2015	Heifer	88	1.67	64.8	85.2	76.1	-	-
	Cow	125	1.34	74.4	95.2	94.4	14.2	122
	Total	213	1.46	70.4	91.1	86.9	14.2	122
2016	Heifer	82	1.41	73.2	90.2	84.1	-	-
	Cow	178	1.52	65.2	89.3	78.1	14.0	120
	Total	260	1.48	67.7	89.6	80.0	14.0	120
2017	Heifer	121	1.29	80.2	86.0	-	-	
	Cow	228	1.41	73.2	87.7	-	13.6	116
	Total	349	1.37	756	87.1	-	13.6	116
Total / Average		1176	1.48	69.3	88.0	80.7	14.2	117

Data is not included due to 51 cattle are still pregnant

Service per conception (S/C). The normal S/C for cattle is 1,76 – 2,0 [3]. It shown that the result of S/C values is better than the normal standard each year from 2013 until 2017 (figure1). The average of S/C during the five years is 1,48 which means it needs 1,48 AI services to make one cattle pregnant. The results shows the achievement of S/C values at LJP is better than the standard.

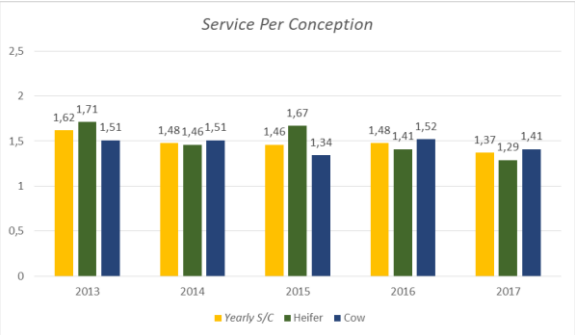

Figure 1. Service per conception of Brahman Cross Cattle from 2013-2017

Conception rate (CR). Conception rate from 2013-2017 can be seen in figure2**.** The average result of CR is 69,3% which means that 69,3% of AI acceptor get pregnant by the first AI service. This result is better than the normal standard of 65%[4].

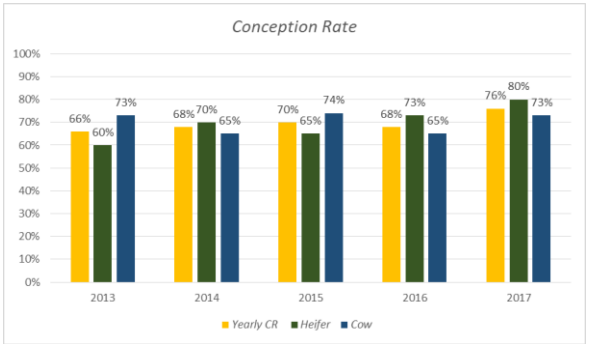

Figure 2. Conception Rate of Brahman Cross Cattle from 2013-2017

Pregnancy rate (PR). The average result of PR is 88,0% with the lowest of 84,6% and the heighest at 95,2% (Figure 3). The average of 88,0% which means that 88,0% of the population of the productive female was pregnant every year. The result of each year PR value is above the standard

value of 80%[4].

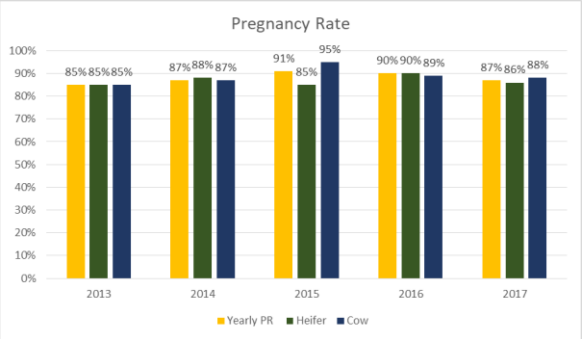

Figure 3. Pregnancy Rate of Brahman Cross Cattle from 2013-2017

Calving rate. Calving rate from 2013-2017 can be seen in figure4. The average result of calving rate is 80,7% which means that every year 80,7% of productive female population succesfuly gave birth to a calf. The normal calving rate is 60-70% and will never reach 100% due to conception failure and fetal or embrionic death[2].

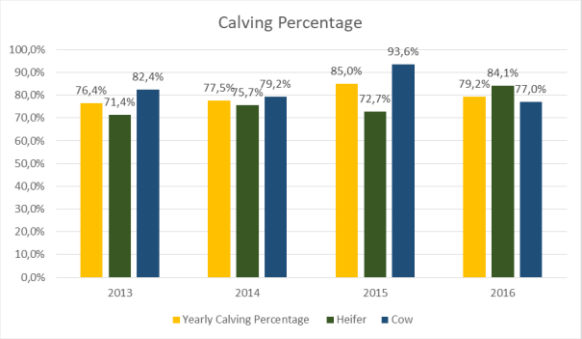

Figure 4. Calving Rate of Brahman Cross Cattle from 2013-2016

Calving interval. Calving interval is the interval between one partus to the next one or the one before. The expected normal calving interval for beef cattle in tropical and subtropical region is 12-14 months[4]. The result as can be seen in table 1, shows the average CI is 14,2 months. The result is still a little bit longer than normal range. This prolonged calving interval can be the result of long days open.

Days open. Days open is interval between partus until a service resulted in conception. The Optimum days open for cattle is 85-115 days[5]. The result as shown at figure1, the average days open is 117 days. The result is still a little bit longer than the optimum days. The factor resulting this prolonged days open at LJP is weaning policy. Calf weaned at the age of 3 months. This happen because suckling or milking can delayed the return to oestrus.

The achievement of reproductive efficiency at LJP could reach excellent result as shown by the value of each parameters is above and within the standard values. The excellent result of reproductive efficiency at LJP is achieved due to good practices of husbandry and reproductive management. In term of husbandry management, LJP provides good quality and quantity of feed according to the different level of reproductive status and age variety. On the other hand, cattle herd has been kept apropriately in different pen based on different reproductive status and age variety such as oestrus observation pen, different age of pregnancy pen, parturition pen, lactation/nursing pen, calf box, weaner pen, and yearling pen.

Reproductive management was conducted comprehensively according to the reproductive status of cattle. Oestrus cycle and oestrus signals was observed intensively within 30 minutes observation during four times observation per day. Insemination is always conducted 9 to 10 hours after the first oestrus signal of standing heat displayed. Pregnancy diagnosis is conducted regularly 60 to 90 days after insemination. Parturition and mothering ability are observed 24 hours during delivery process by the keeper in the parturition cage.

CONCLUSION

The reproductive efficiency of Brahman Cross cattle observed at LJP is better than standard. High reproductive efficiency could only be achieved at the farm that conduct good practice of husbandry and reproductive management.

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