Reproductive Performances of Ongole Crossbred Cattle Using Artificial Insemination Sexed Semen with Diferrent Methods

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ABSTRACT: Artificial Insemination (AI) clearly shows to improve the genetic quality of cattle which can be applied on cattle breeding farm. Sexing spermatozoa is a method that provides more value, because it may produce sex of calf as expected. There are several methods of sexing sperm that can be frozen and has been generated including frozen sexed semen using White Yolk Sedimentation and frozen sexed semen using Percoll Gradient Centrifugation. The purpose of this research was to determine the success of AI with frozen sexed semen based on non return rate (NRR), service per conception (S/C), conception rate (CR), and percentage of pregnancy. In this study, the total number of 81 acceptors was divided into 3 treatment groups, such as non sexed semen (T0); Frozen sexed semen using White Yolk Sedimentation (T1), and Frozen sexed semen using Percoll Gradient Centrifugation (T2). The results showed the differences of NRR percentage on those treatments, which were T0, had 74.07±12.00% of NRR; T1 had 65.43±5.66% of NRR and T2 had 64.19±8.56% of NRR respectively. The highest percentage of pregnancy was 59.25% at T0, followed by 51.85% at T1 and the lowest percentage of pregnancy was 44.44% at T2. The service per conception was found 2.31 at T0 followed by 3.00 at T2 and 3.33 at T1. Furthermore the highest of conception rate was found 44% at T0, continued with 25.91% at T2 and 18.51% at T1. The study concludes that the AI with frozen sexed semen remains able to give good performances of reproduction on Ongole crossbred cattle. This study suggests that the quality of frozen sexed semen should be increased to have better reproductive performances on Ongole crossbred cattle.

Key words: sexing, artificial insemination, White Yolk Sedimentation method, Percoll Gradient Centrifugation method.

INTRODUCTION

Artificial insemination using sperm sexing provide benefits to the livestock industry, among others, required for beef cattle industry with the male sex, For Fattening. There are various methods of sexing spermatozoa has been found ncluding the sedimentation method using albumin column and density gradient centrifugation percoll (Hafez and Hafez, 2008) Sexing method easily applied is egg white sedimentation and Percoll density gradient centrifugation method (SGDP) because after having been frozen more than 30% motility and proportion have sepermatozoa Y>80% (Susilawati, 2014). Research results Susilawati (20015) show by using sperm without sexing, It produced 50% male calves, whereas Artificial Insemination using Sperm sexing (percoll density gradient centrifugation) resulting of 75% male calf. it is necessary to research on the application of frozen semen sexing, using egg white sedimentation and density gradient centrifugation percoll on the folk husbandry to the success of pregnancy

MATERIALS AND METHODS

Research conducted on a farm owned by the people, using 81 head of beef cattle adult females, between the ages of 1.5 to 5 years and Normal Fisiology. The method used in this research is the Experimental. Cows in AI is 81 Head consisting of, T1 = 27 Head Cows are in AI using frozen semen sexing spermatozoa containing chromosome Y with methods Sedimentation egg whites. T2 = 27 Head cows in AI using semen sexing spermatozoa containing chromosome Y with methods Percoll density gradient centrifugation and T0 = 27 Head in AI using frozen semen non sexing (control). AI method on the recto vaginal 4+ position (*deep insemination*) (Susilawati, 2011[b]). Pregnancy examinations done two ways: method Non Return Rate (NRR), NRR 1 (18-21 days), NRR 2 (38-41 days) and NRR 3 (58-61 days) and Rectal palpation performed 60 days after AI.

1. *Non Return Rate* (NRR) include NRR 1, NRR 2 dan NRR3

NRR values obtained by observing estrus on days 21, 42 and 63 after the AI. If it does not show signs of estrus in the day then assumed pregnant cattle Susilawati (2011[a]) and (Susilawati, 2013)

2. *Service per Conception*

Value of the S / C is obtained by counting the number of AI services provided in the acceptor to occur gestation, the formula S / C is as follows:

$$S/C = \frac{(\text{Total insemination until a pregnancy})}{(\text{The number of cows that at AI})}$$

Jones and Stewart (1992) and Susilawati (2013)

3. *Conception Rate*

CR value is obtained by calculating a successful cattle AI pregnant at first, with the following formula

$$CR = \frac{\text{the number of pregnant females the first AI results diagnosed rectal}}{\text{The total number of females were inseminated}} \times 100\%$$

(Jainudeen and Hafez, 2008) and Susilawati (2013)

4. Rectal Examination is the accepted method of pregnancy diagnosis in Cow. In this procedure, the uterus is palpated throught the rectal will to detect the uterine enlargement occuring during pregnancy and the fetus or fetal membrane (Jaenudeen and Hafez, 2008)

Data Analysis

Collection of data from the field, were analyzed descriptively, followed by statistical analysis. Statistical design of experiments to test the NRR using nested, While the statistical design to test the S / C, CR, using the test one way classification Further test used is the Least Significance Difference (LSD)

RESULTS AND DISCUSSION

Post Thawing Motility (PTM) of frozen semen sexing lower than non frozen semen sexing at table 1

Table 1. The quality of spermatozoa in various treatments while in the Laboratory and before the AI

No	Sexing Method	Consentration	%PTM (Lab.)	%PTM (Fild)
1	White eff sedimentation	62 x 107	30-40 %	25-40 %
2	SGDP	68 x 107	10 %	5-10 %
3	Non Sexing	25 x 107	≥40 %	≥40 %

The quality of sperm sexing resulting lower than the results of previous studies conducted by Susilawati (2005) that is the percentage of sperm motility after sexing using density gradient centrifugation percoll is 55% after freezing and thawing in population of spermatozoa X to 35%, whereas the population of spermatozoa Y 40% It is because of this research printing process (filling and chilling) not good. so that liquid nitrogen can enter into the straw. in the opinion Ervandi *et al.*, 2013 dan Purwoistri *et al.*, 2013) Spermatozoa sexing using egg white sedimentation decreased motility due to the increase of spermatozoa with low membrane integrity and spermatozoa undergo the acrosome reaction. The quality of frozen sperm sexing is strongly influenced by handling during the process of sexing and freezing, so that sperm sexing his post thawing Motility lower than in controls, this is because it is based Susilawati (2014) that spermatozoa sexing by using centrifugation damaged membranes, resulting in a decrease in sperm quality. Frozen sperm sexing AI used in this study was lower than previous research. Decrease in the quality of the frozen sperm sexing lab caused the plug on less dense straw. This resulted in liquid N2 can enter into the straw and damaged spermatozoa. low sperm motility can be used to AI, based on the research Susilawati (2011[b]) AI using frozen sperm motility percentage between 5-20% can be used to AI

Diagnosis results Gestation between observation methods NRR with Rectal palpation method

The results showed there are differences between NRR pregnancy diagnosis by rectal palpation method at table 2

Treatment	Gestation examination							
	NRR last observation				Rectal palpation			
	pregnant		not pregnant		pregnant		not pregnant	
	Total Cow (Head)	%	Total Cow (Head)	%	Total Cow (Head)	%	Total Cow (Head)	%
P0	20	74.07	7	25.93	16	59.25	11	40.75
P1	16	59.26	11	40.74	12	44.44	15	48.15
P2	16	59.26	11	40.74	14	51.85	13	55.56

(59.25%). pregnancy diagnosis in the percent difference between the observations NRR with rectal palpation consecutive start T0, T1 and T2 is 14.82%; 14.82% and 7.41%. Meaning that there has been a silent heat or death of the embryo that many this research. The results are consistent with the statement Jainudeen and Hafez (2008) and Susilawati (2011[b]) which states that the differences between the percentages of pregnancy based NRR with rectal palpation, if NRR of 70% then it is

likely to dropped if detected by rectal palpation be 60-65%.

Service per Conception

The results of statistical test to the calculation of the S/C on various treatments did not show significant differences (P <0.05). However Value S/C best in the treatment group T0 = 2.31, followed at T2 = 3.0 and the ugliest in the treatment group T1 = 3.33. The result is lower when compared with previous research (Susilawati, 2005) Services per conception in Position 4 and 4+ frozen semen control was 1.42 and 1.25. whereas AI using frozen semen sexing by density gradient centrifugation percoll is 2 and 1.83. S/C at position 4+ better than the 4 position. The high S/C is caused by the poor quality of sperm sexing used. Jones and Stewart, (1992) the mean number of services per pregnancy base on data from pregnant cow gives an estima of fertility in cows. At the reasearch very different from the true of services per pregnancy when the inseminations of non- pregnant cows are included. Following from that, appropriate formulae are derived for estimating true and apparent number of services per pregnancy. factors other than the quality of sperm is timeliness of Artificial Insemination and estrus Quality, Perry *et al*. (2007) stated that the probability of success of artificial insemination greatly influenced the timing of insemination, Also standing estrus determine the success or failure of insemination and also an indication of ovulation in cattle. Cows were used In this research are given feed less this is causing many silent heat cows or early embryonic death

Conception Rate

Conception Rate value resulting at T0 (44,44%) is control, the lowest at T1 (18.51%) while T2 (25.92%). Results of statistical tests on the various treatments are not significant differences (P<0.05). Resulting percentage CR is lower than the results research Susilawati (2005) and Susilawati (2014) which states that value of CR on spermatozoa Y is 70% the AI with Position 4, while at position 4+ resulting 80%. while according Susilawati (2011[b]) AI using sperm motility between 5-20% with a yield of pregnancy 65%. the results of AI at position 4 resulted in pregnancy 77.5%, whereas the position 4+, generating 87.5% of gestation. The low yield is due to the quality of research results sexing semen used more bad and and also physiologically cattle also not good because of the low quality of the feed given.

CONCLUSION

AI treatment using sperm sexing with SGDP method gives a higher percentage of pregnancy of 51.85%, AI treatment compared to using semen sexing with albumin column separation method which is only 44.44%. However, AI results using frozen semen is 59.25%.

SUGGESTION

Packaging of sperm sexing improved and the AI in cattle that good maintenance management so that good reproductive physiology.

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