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ORIGINAL RESEARCH ARTICLE

OPEN ACCESS

## INFLUENCE OF pH VAGINAL MUCOSA WHEN ARTIFICIAL INSEMINATION OF *NON RETURN RATE* (NRR) AND *CONCEPTION RATE* (CR) ON DAIRY COW IN KSU TUNAS SETIA BARU PASURUAN EAST JAVA

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Dairy cow, Artificial Insemination (AI), pH vaginal mucosa, *Non Return Rate* (NRR), *Conception Rate* (CR).

### ABSTRACT

This study aims to find out the vaginal mucosa during artificial insemination against *Non Return Rate* (NRR) and *Conception Rate* (CR) in the highlands. Sixty female dairy cows were used as samples in this study. The pH of the vaginal mucosa is measured by digital pH meter on each dairy cow at the time of artificial insemination. *Non Return Rate* (NRR) observation was performed on the 21st day after insemination and *Conception Rate* (CR) was performed on day 60 after insemination. The effect of pH of the vaginal mucosa during artificial insemination is in the range of 6.8 to 8.5. in pH is 7.2 with the number of 12 that pregnant dairy cows. In this research yields very good percentage in dairy cow for *Non Return Rate* (NRR) that is 88,33% and *Conception Rate* (CR) is 86,79%.

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### INTRODUCTION

In Indonesia, the demand for milk from year to year is increasing this is in line with the increasing number of population and public awareness of nutritious food. However, the high demand and demand for milk in Indonesia is still not able to be met by domestic milk production, both in quantity and quality. The low productivity of dairy cattle can occur due to the lack of knowledge of the farmers on the ways of livestock management, post-harvest feed management, recording application, milking (Haloho *et al.*, 2013) and reproductive disorder followed by decreasing birth rate

(Hariadi *et al.*, 2011). One way to increase livestock productivity is to improve reproductive performance. The normal reproduction process will be followed by improved dairy productivity. The higher the reproductive capacity, the higher the productivity of the livestock (Oktaviani, 2010). Artificial Insemination Technology (IB) is one of the reproductive technologies that has been able and successful in a short time can produce children with good quality in large numbers by utilizing superior males (Susilawati, 2011). The parameters of successful artificial insemination can be seen from the calculation of *Conception Rate* (CR), *Calving*



Interval (CI), Service per Conception (S / C), Days Open (DO), Calving Rate (CvR) and Non Return Rate (NRR) (Hariadi et al., 2011; Alfiati et al., 2013). Potential of Hydrogen (pH) is an important parameter in determining the quality of survival of spermatozoa in the cervix and vagina. Normal cow cement has a pH ranging from 6.4-7.8 (Garner and Hafez, 2010). According to Gorodeski et al., (2005) the range of vaginal pH is 5.5-8.6. In 400 cows the vaginal pH near the cervix is between 5.5 and 8.0 whereas nearly 50% of these measurements are in the range of 6.0-7.5. In 400 cows examined at different periods of each cycle of estrus, the results showed a decrease and increase in pH. The uncertain state of pH is affected by the dairy cow environmental conditions that may affect the reproductive performance even more if the feed intake is poor (Ratnawati et al., 2010). According to Hariadi (2011) the reproductive efficiency in cattle is considered good if the value of Non Return Rate (NRR) reaches an average of 68-78% and the reproduction efficiency in cattle is considered good if Conception Rate (CR) can reach 65-75%. Non Return Rate (NRR) and Conception Rate (CR) will decrease if they do not meet the factors that influence the success of IB that is by the acceptor dairy cow selection, the effort in eradicating kemajiran, the ability of the breeder to know cow estrus, inseminator skills in doing AI, the quality and quantity of cement (Susilawati et al., 2010). The population of dairy cows is mostly in East Java, among others, in Pasuruan Regency which has potential for agriculture and livestock. The location chosen in the research is KSU Tunas Setia Baru which is one of the areas with dairy cow milk from milk dairy cow and also the newly established KSU in 2012. In general, reproductive disorder can cause a fetus or infertility one of which is a female cow showing symptoms Repeat breeder. Based on the above background, a pH of vaginal mucosa will be assessed on livestock productivity assessed from Non Return Rate (NRR) on day 21 and percentage of Conception Rate (CR) on day 60 in female dairy cows after artificial insemination (IB). In this research will be selected cooperative Tunas Setia Baru Pasuruan as a research location.

## MATERIALS AND METHODS

The research was conducted at KSU Tunas Setia Baru Pasuruan Regency April - July 2017. The material for this research is 60 female dairy cows, frozen cuttlefish straw (production of BBIB Singosari) dairy cow is used for the implementation of Artificial Insemination, pbs and cotton solution is used to keep the digital pH meter equipment to remain sterile after use. The research tool used is plastic sheath, plastic gloves, AI gun, alcohol, cotton and digital pH meter to measure pH value of vaginal mucosa. How to use digital pH meter is by pressing the on button, then enter the electrode into the vulva that concerns the vaginal mucosa and wait until the range listed on the pH meter digital screen has not changed.

### Measurement with digital pH meter device

Data Collection This research is an explorative field research. By incorporating a digital pH meter device in a dairy cow. Then recording pH data of vaginal mucosa of dairy cattle after just prior to artificial insemination (IB).

### Implementation of Artificial Insemination (IB)

Artificial Insemination is carried out after the measurement of digital pH meter on the vaginal cow of dairy cows.

### Non Return Rate (NRR)-21

Non Return Rate (NRR) data on the next 21st day by checking whether the female dairy cows show visible signs of lust which are obvious from outside physical phenomena. After that it can be concluded the female dairy cow is experiencing lust again or not. The data have been obtained is calculated using Susilawati (2011) formula:

$$\text{Non Return Rate (\%)} = \frac{\text{Number of cattle not returning to marry}}{\text{Number of cattle in the AI}} \times 100\%$$

### Conception Rate (CR)-60

Conception Rate (CR) data was collected through rectal palpation on day 60 after artificial insemination on dairy cows that were not lusted again. The data has been obtained is calculated using the formula Hafez (2000):

$$\text{Conception Rate (\%)} = \frac{\text{Number of pregnant cattle in first AI}}{\text{Number of cattle in the AI}} \times 100\%$$

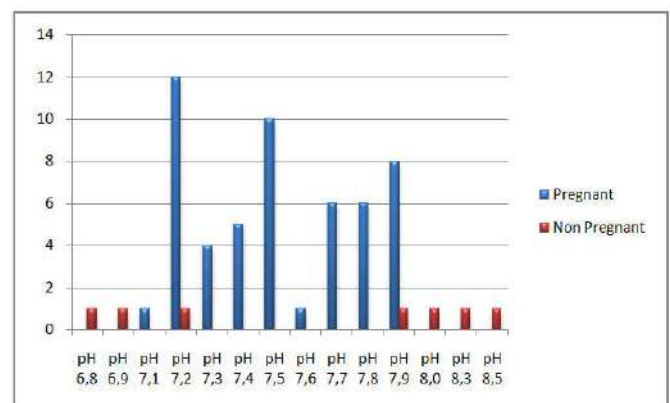
### Data Analysis

Data analysis was performed by descriptive analysis aimed to see whether or not the effect of pH of the female dairy cow vagina mucosa during artificial insemination against Non Return Rate (NRR)-21 and Conception Rate (CR)-60.

## RESULT

Potential Hydrogen (pH) of the vaginal mucosa on 60 dairy cows with a pH ranging from 6.8 to 8.5. However, as can be seen in Table 1, dairy cow pH indicates that pH 7,2 is mostly with the number of 12 pregnant cows from a total of 53 dairy cows.

Table 1. Effect of pH of the vaginal mucosa on the number of pregnant and non pregnant dairy cows

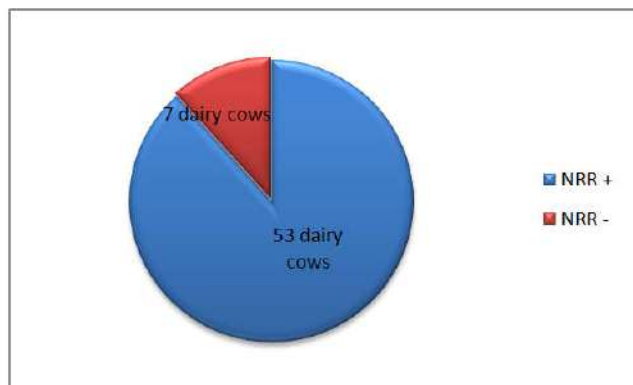


Non Return Rate (NRR)-21 by checking whether or not signs of lust after insemination indicated that Non Return Rate (NRR)-21 indicating positive or non-return result in dairy cow with 88.33% and on The percentage of 11.67% shows a negative result or dairy cow estrus again. In table 2 it can be concluded that out of a total of 60 dairy cows there are 53 dairy cows that do not estrus again ((NRR (+)) and 7 dairy cow estrus again ((NRR-)).

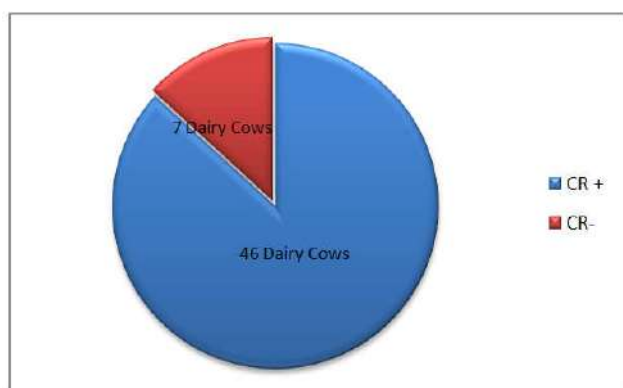
The results of Conception Rate (CR) -60 with rectal palpation indicate that the percentage of Conception Rate (CR) which showed positive results or pregnancy in the dairy cattle



with 86.79% and 13.21% showed negative or non-pregnant results in dairy cows.



Picture 1. Diagram Non Return Rate (NRR)-21 to the number of dairy cows in KSU Tunas Setia Baru Pasuruan



Picture 2. Diagram Conception Rate (CR)-60 to the number of dairy cows in KSU Tunas Setia Baru Pasuruan

In the gamar can be concluded that of the total 53 female dairy cows that do not estrus again. there are 46 dairy cows that pregnant on the first AI (CR (+)) and 7 dairy cows that are not pregnant on the first AI ((CR-)).

## DISCUSSION

In this study the percentage of *Non Return Rate* (NRR) -21 is 88.33% higher with *Conception Rate* (CR) -60 is 86.79%. At pH 7.2 shows the highest number of pregnancies with 12 dairy cows. However, female dairy cows in the IB in the range of pH 8.0 to 8.5 showed poor results that the cow was not pregnant. From these results are possible factors that may affect the pH of the vaginal mucosa in the cows. The state of the acid or bases of mucosa from the vaginal mucosa by the biophysical and biochemical conditions of the mucus produced by the cervix itself is affected by the hormones that play during the estrous cycle (Pras dini *et al.*, 2015). According Suharto (2003) stated the difference pH of cervical mucus caused by estrogen levels at the time of estrus. The presence of OH elements in the estrogen element can cause the pH to be positive toward neutral to alkaline. The occurrence of recurring cattle or repeat breeders in KSU Tunas Setia Baru is also a factor that causes cows that have been in IB but not cause pregnancy. In general, mating repeated by 2 main factors namely the failure of fertilization and early embryo death. Factors that cause conception failure are abnormal anatomic abnormalities of the

reproductive tract, abnormalities of ovulation, abnormal sperm, abnormal eggs and mismanagement. The presence of early embryo failure often does not show clear abnormalities in the mother and follows a extended cycle of lust to 27 to 30 days. Factors that cause early embryonic death are genetic, infection, environmental, hormonal imbalance, feed, parent age, semen fertility, number of embryos or fetuses in utero (Hariadi, 2011).

## Conclusion

Based on the results of research that has been done can be concluded that the pH of the vaginal mucosa pH 7.2 is the best pH that can produce the highest conception rate. The results showed very good results with percentage Non Return Rate (NRR) is 88,33% and Conception Rate (CR) is 86,79%.

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