Chalaza Journal of Animal Husbandry
Url: http://usnsj.com/index.php/Chalaza
Email: chalaza.usnsj@gmail.com

The Effect of Males Age on the Quality of Bali Cattle Fresh Semen

AUTHORS INFO

Nirwana
Universitas Sembilanbelas November Kolaka
nirwanausn@gmail.com

Suparman
Universias Sembilanbelas November Kolaka
suparman77ptk@gmail.com
+6282345330077

ARTICLE INFO

o-ISSN: 2548-3803
p-ISSN: 2548-5504
Vol. 2, No.2, December 2017
URL: http://usnsj.com/index.php/CJAH/view/CJAH.2.2.13-18

Abstract

This research was conducted by conducting experiments in UPTD laboratory of Livestock and Livestock Feeding Agricultural Service of Sulawesi Barat Province. The purpose of this research is to compare the age of males during March to April 2013. The results of this research are expected to be used as a guideline for the use of Bali Cattle research as a semen producer based on the age of livestock that can be used as one of the criteria in the selection of prospective semen producing males. The research material is fresh semen of Bali Cattle with requirement of 70% individual motility. The research method used is observation method by observing the fresh semen quality of Bali Cattle research which has been classified into 3 groups based on age 3, 5, and 6 years. The data analysis used is the analysis of the variety and the design is Completely Randomized Design. The results showed that the quality of fresh semen in the three age groups (3, 5, and 6 years) where volume: 5.2 ± 1.2; 6.4 ± 1.1; And 6.4 ± 0.8 ml, color: milk, white, pH: 6,4 ± 0,1; 6.4 ± 0.1; And 6.3 ± 0.1, consistency: concentrated; Medium; Concentrated and concentrated, concentrations: 1909.6 ± 418.8; 1223.3 ± 220.8; And 1790.8 ± 240.5 million / ml, and 92.5 ± 2.9%, abnormality: 4.4 ± 1.2; 4.3 ± 1.2; And 3.3 ± 1.0%. The conclusions of this research indicate that the age of males gives a significant effect on the fresh semen volume, fresh semen concentration, gives a very significant effect on fresh semen concentration and does not have a significant effect on fresh semen sperm abnormalities. And a male of Bali Cattle age 3-6 years old in UPTD Livestock Feeding and Animal Feed Agricultural Service of Sulawesi Province has good semen quality for Artificial Insemination.

Keywords: bali cattle, semen, age, sex of cattle.

A. Introduction

Artificial Insemination is a marine technique by inserting fresh semen or frozen semen into the female genital tract by means of a device made by humans. It aims to improve the genetic quality of livestock, avoid the spread of venereal disease, increase the number of offspring of superior males with insemination to many females and improve the welfare of farmers (Ihsan, 1997; Blakely & Bade, 1998; Ax, Dally, Didion, Lenz, Love, Varner, Hafez & Bellin, 2000; and Pangestu, 2002). Artificial Insemination is one of the programs passed by the

government to improve the genetic quality and productivity of cattle in Indonesia. Through artificial insemination technology the potential of superior bulls can be optimized. The quality of semen has an important role in artificial insemination, so it needs careful and careful examination (Anonimus, 2005). Motility is the most widely used criterion for semen evaluation. Spermatozoa motility calculation method is relatively simple ie observation by using a microscope. Susilawati, Suyadi, Nuryadi, Isnaini & Wahyuningsih (1993) stated that the qualified semen of a superior male can be influenced by several factors, such as male's age, genetic characteristics, temperature and season, ejaculation frequency and food. An experiment was cited by Susilawati, et al. (1993) reported that males aged 2 to 7 years can produce the best semen with high pregnancy rates in married females compared with males outside the interval. The age factor is one of the factors affecting the quality of fresh semen, however there is not much information about the effect of age on fresh semen quality, so further research is needed. Based on the above, the authors will conduct research on "The Effect of Males Age on The Quality of Fresh Semen Bali Cattle".

B. Methodology

1. Materials

This research has been carried out in early located at Cattle Farm at The Regional Insemination Centre – Livestock Hall of Sulawesi Province (UPTD-IB). The research material used is fresh semen with the individual motility requirement of 70%, minimum mass motility 2+, and frozen semen obtained from 3 male cattle stud Bali. Tools used: Artificial vagina, Light microscope, Object glass, Ose, Spectrophotometer. Materials used: Fresh Semen Cattle Bali, Semen before freezing, Semen frozen Bali Cattle, Eosin-negrosin dye, 3% Na-Cl.

2. Method

The research method used is the method of observation. The parameters observed were percentage of motility of spermatozoa on fresh semen, frozen semen and percentage of viability and spermatozoa abnormalities on fresh semen Balinese cattle were classified into 3 groups by age: a. Bali Cattle age 3 years as much as 1 tail. B. Bali Cattle age 5 years as much as 1 tail. C. Bali Cattle age 6 years of 1 tail. Semen Bali Semen Shelter has done 2 times a week, on Monday and Thursday with 2 times ejaculations. The number of replications during this research as much as 6 times. Data obtained during the research and then analysed by using variance analysis.

3. Parameters

a) Fresh Semen Volume
   The immediate semen volume was observed after the shelter, which the results can be seen on 10 ml storage tube scale.
b) Color of Fresh Semen
   Colors of semen can be categorized into 3 kinds of white yellowish, white milk and white clear.
c) Fresh Semen pH
   PH can be seen by matching the color of the litmus paper that has been dropped by semen with color on the litmus paper packaging tube.
d) Fresh Semen Concentration
   The spermatozoa concentration can be calculated using a spectrophotometer, by mixing 0.02 ml of semen liquid with 3.98 ml of 3% NaCl, then homogenized, after it is placed into the cuvet and inserted in the spectrophotometer, the result can be read by looking at the screen in the spectrophotometer which is then matched with a handle.
e) Spermatozoa Motility
   Mass motility can be observed by dripping the semen into a glass object and covered with a glass cover, then observed using a microscope with 100x magnification. The assessment is as follows:
   +++ = big waves, large numbers and fast to move places.
   ++ = small waves are small and slow to move.
   + = The waves do not exist, only the movement of spermatozoa themselves.
   N = no moving spermatozoa, all dead. In such circumstances, it is called necrospermia.

Mass motility is based on the number of moving spermatozoa, the percentage of live spermatozoa and its movement activity. Very good judgment (+++), moderate (++), ugly (+), and

very ugly (N). Individual mobility is checked by dripping a drop of semen on an object and covered with a glass cover, then observed using a microscope at 400x magnification. How to calculate as follows:

$$\frac{\text{Total of Spermatozoa Progresif}}{\text{Total Spermatozoa Progresif} + \text{Spermatozoa non Progresif}} \text{ x } 100\%$$

a) Spermatozoa Viability

The examination is done by dripping a drop of eosin-negrosin and placed on one glass of clean and warm object, then the one drop of semen is added and mixed evenly. After drying checked by microscope with 400x magnification and calculated 100 spermatozoa cells. The live spermatozoa do not absorb the color, while the dead absorb the color. How to calculate as follows:

$$\frac{\text{Total of } \textit{Life} \text{ Spermatozoa}}{\text{Total of } \textit{Life} \text{ Spermatozoa} + \text{Total of } \textit{Dead} \text{ Spermatozoa}} \text{ x } 100\%$$

b) Spermatozoa Abnormalities

Calculation of percentage of spermatozoa abnormalities using the same preparation with preparations to calculate the percentage of live spermatozoa. The way of calculation is as follows:

$$\frac{\text{Total of } \textit{Abnormal} \text{ Spermatozoa}}{\text{Total of } \textit{Normal} \text{ Spermatozoa} + \text{Total of } \textit{Abnormal} \text{ Spermatozoa}} \text{ x } 100\%$$

4. Data Analysis

Data obtained during the research, then it is analyzed using analysis of the variety and design used is Completely Randomized Design. If there is any real difference, then it is continuing with the test of Small Difference.

C. Result and Discussion

1. Quality of Fresh Semen.

Fresh semen used in this study is the result of fresh semen reservoirs of Bali cattle aged 3, 5 and 6 years obtained from UPTD Livestock Breeding and Forage Landmarks Sulawesi Provincial Agriculture Office. The fresh semen examination includes volume, color of semen, pH, consistency, concentration. Inspection of fresh semen is done to see the quality of the semen whether it can be done next process or not.

2. Fresh Semen Volume.

The test results mean fresh semen volume is shown in Table 2. Data were analyzed using analysis of variance and used was completely randomized design (CRD) design. If there is any continued difference by Least Significant Difference (LSD)

Table 2. Fresh Semen Volume in 3 Groups of Age Cattle Bali

Male, Age (Year)	Average Volume ± SD (ml)
3	5,2±1,2a
5	6,4±1,1b
6	6,4±0,8b

Note: Different notations show a marked difference (P <0.05)

Volume is one of the minimum standards for quality evaluation that will be used for Artificial Insemination. The volume of beef semen semen ranges from 4-6 ml / ejaculate (Bearden & Fuquay, 1984). The nature of semen is influenced by the age of the male and the interaction between age and interval of shelter. Age also has a significant relationship with the season, so it can affect the volume of ejaculate and percentage motile spermatozoa. Male age at the time of semen shelter affects ejaculate volume, concentration and motility of spermatozoa (Mathevon, Buhr & Dekkers, 1998). The males age had a significantly different effect (P <0.05) on a fresh semen volume in the age group of 5, 6 years, and fresh semen volume was best shown in the 6 years age group of 6.4 ± 0.8 ml. The difference in volume is thought to be due to different age variations, which can affect the size of the testes and the production of semen.

According to Susilawati, et al. (1993) and Mathevon, et al. (1998) large testicular size has more seminiferi tubules, which will increase the number of spermatozoa supported by more seminal plasma seminal. Testicular size is positively correlated with weight gain. The volume of semen obtained during the study was lower than other research, which was 8.45 ± 4.45 ml. Although according to Hafez (2000) the volume is still normal that is between 5-8 ml.

3. Color of Fresh Semen.

The color of semen varies between the color of milk, white, brown, yellow and cream (Anonimus, 1992). The results of fresh semen color examination in all three age groups of Bali Cow during the study were white milk. The color of this semen is normal according to the opinion of Bearden & Fuquay (1984) and Susilawati, et al. (1993) which states that the color of cow semen from normal ejaculation is white milk and 10% are cream colored.

4. pH of Fresh Semen.

The results of the fresh semen pH were examined in Table 3.

Table 3. Fresh Semen pH at 3 Bali Cattle Age Group

Age of males (Year)	pH average ± SD
3	6,4±0,1
5	6,4±0,1
6	6,3±0,1

The average results of cattle Bali semen pH examination in the 3, 5 and 6 year age group were 6.4 ± 0.1, 6.4 ± 0.1, respectively; And 6.3 ± 0.1.pH this can still be said to be normal because Bearden & Fuquay (1984) state that the average normal semen pH is 5.9-7.3. The pH of semen in each age group showed no significant difference between males. It allegedly influences the content of citric acid. Susilawati, at al. (1993), the content of citric acid in each semen of the study may change depending on the condition of the males. Bearden & Fuquay (1984) suggest that high spermatozoa concentrations are more acidic than semen with low spermatozoa concentrations.

5. *Consistency of Fresh Semen.*

The results of the fresh consistency of semen consistency are shown in Table 4.

Table 4. Consistency of Fresh Semen at 3 Groups of Age Cattle Bali.

Age of males (Year)	Average Consistency
3	**P**
5	**S**
6	**P**

Note:

- P = Concentrated
- S = Medium

Consistency is the degree of consistency. The consistency of semen can be checked by shaking the tube containing the semen. Good semen, its viscosity degree is almost the same or slightly thicker than milk, while the seminy is ugly, both color and consistency similar to coconut water (Hafez, 2000). At the study site, how to check the consistency of semen not to shake the tube containing the semen, but by looking at the concentration of semen which has previously been calculated by using a spectrophotometer, with a standard calculation as follows:

< 1000 = watery
1000-1500 = medium
> 1500 = concentrated

6. Concentration of Fresh Semen

The average concentration of fresh semen is shown in Table 5.

Table 5. Concentration of Fresh Semen at 3 Groups of Age Cattle Bali.

Age of males (year)	Konsentrasi rata-rata ± SD (106/ml)
3	1909,6±418,8b
5	1223,3±220,8a
6	1790,8±240,5b

Note: Different notations show a very real difference (P <0.01)

Lunstra & Echternkamp (1982) reported that the concentration of spermatozoa Hereford and Angus cows were accommodated twice a week using an artificial vagina amounted to 200-700 million spermatozoa/ml, and Charolais Cattle were accommodated once a week at 200-1200 million spermatozoa/ml for 12 The first week after reaching puberty. Differences in spermatozoa concentrations among males are thought to be due to genetic quality in each male (Situmorang, 2002). The concentration and the percentage of motile spermatozoa was influenced by the Age of lazy and have a tendency to increase with age up to 22 months (Mathevon, et al., 1998).

Age of males gave a very significant different effect (P <0.01) on fresh semen concentrations in the 3, 5 and 6 years age group. Balinese cattle in the 3-year age group showed the highest concentration among other age groups. This happens because in old age, spermatogenesis process activity has decreased so that the spermatozoa produced will also decrease. The concentration of spermatozoa from the four age groups of cattle is still quite normal when compared with studies Brito, Silva, Viera, Deragon & Katelic (2002) in cattle Bos Taurus, namely 1,200 million / ml in males aged 1 and 2 years.

7. Abnormalities of Fresh Semen Spermatozoa.

The results of the average abnormalities of fresh semen spermatozoa are shown in Table6.

Table 6. Fresh Semen Spermatozoa Abnormalities in 3 Groups of Age Cattle Bali.

Age of males (Year)	Abnormalities of average ± SD (%)
3	4,4±1,2
5	4,3±1,2
6	3,3±1,0

The results showed that Age of males did not affect the percentage of fresh semen abnormalities (P> 0.05). Percentage of abnormality of all age groups is still within the normal range. This is in accordance with the opinion of Toelihere (1993) which states that abnormalities of less than 20% can still be used for insemination. Sperm abnormalities over 30-35% indicate male infertility.

D. Conclusion

The results showed that Age of males had significantly different effect on fresh semen volume, fresh semen concentration and fresh semen spermatozoa have a very significant different effect on fresh semen concentration and did not give a significant effect on the motility of fresh semen and semen spermatozoa abnormalities fresh. , And fresh semen volume is best shown in 6-year-old males of 6.4 ± 0.8 ml. Because so at age 6 can affect the size of the testes and the quality of semen. Large testicular sizes have more seminiferi tubules, which will increase the number of spermatozoa supported by more seminal plasma seminal and are positively correlated with increased body weight.

E. References

Anonimus. (1992). *Seleksi Bibit Pejantan Sapi Madura Guna Meningkatkan Mutu Sapi Madura: Seleksi Calon Pejantan Sapi Madura*. Proyek Pembangunan Penelitian Pertanian Nasional bekerja sama dengan Sub Balai Penelitian Ternak Grati. Badan Penelitian dan Pengembangan Pertanian.

..... (2005). *Program Inseminasi Buatan Sebagai Pendukung Usaha Peternakan*. Malang: Mafaterna, Fakultas Peternakan Universitas Brawijaya.

Ax, R.L., Dally, M.R., Didion, B. A., Lenz, R.W., Love, C.C., Varner, D.D., Hafez, B. & Bellin., M.E. (2000). *Artificial Insemination in Reproduction in Farm Animals*. Edited by E. S. E. Hafez. *7th edition*. Maryland, USA: Lippincott Wiliams and Wilkins.

Bearden, H. J. & Fuquay, J. W. (1984). *Applied Animal Reproduction*. *2nd edition*. Virginia: Reston Publishing Company, Inc.

Blakely, J. & Bade, D. H. (1998). *Ilmu Peternakan*. *4th edition*. Terjemahan Srigandono, B. Yogyakarta: Gadjah Mada University Press.

Brito, L. F., Silva, A. E., Rodrigues, L. H., Vieira, F. V., Deragon, L. A. & Kastelic, J. P. (2002). Effects of Environmental Factors, Age and Genotype on Sperm Production and Semen Quality in Bos indicus and Bos taurus AIBulls in Brazil. *Animal Reproduction Scienc* 70, pp. 81-90.

Hafez, E. S. E. (2000). *Semen Evaluation in Reproduction in Farm Animals*. *7thedition.* Maryland, USA: Lippincott Wiliams and Wilkins.

Ihsan, M. N. (1997). *Manajemen Reproduksi*. Malang: Fakultas Peternakan Universitas Brawijaya.

Lunstra, D.D. & Echternkamp, S.E. (1982). Puberty in Beef Bulls: Acrosome Morphology and Semen Quality in Bulls of Different Breeds. *J. Animal Science 55* (3)

Mathevon, M., Buhr, M. & Dekkers, J.C.M. (1998). Environmental, Managementand Genetic Factors Affecting Semen Production in Holstein Bulls. *Journal Dairy Science* 81, pp. 3321-3330.

Pangestu, M. (2002). Preservation of Spermatozoa: Methods and Applications. Indonesian Forum on Reproduction. *Journal on Reproduction. 1*(2), pp. 55-56.

Situmorang, P. (2002). The Effects of Inclusion of Exogenous Phospolipid In Tris-Diluent Containing a Different Level of Egg Yolk on the Viability of Bull Spermatozoa. *Pusat Penelitian dan Pengembangan Peternakan dan Badan Penelitian dan Pengembangan Pertanian, Bogor 7* (3), pp. 131-187.

Susilawati, T., Suyadi, Nuryadi, Isnaini, N. & Wahyuningsih, S. (1993). *Kualitas Semen Sapi Fries Holland dan Sapi Bali Pada Berbagai Umur dan Berat Badan*. Malang: Laporan Penelitian. Fakultas Peternakan Universitas Brawijaya.

Toelihere, M. R. (1993). *Inseminasi Buatan Pada Ternak*. Bandung: Angkasa.