# THE EFFECT OF BAMBOO LEAVES INFUSION ON MOTILITY OF BULLS SPERMATOZOA

*By* Budi Purwo Widiyarso

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# THE EFFECT OF BAMBOO LEAVES INFUSION ON MOTILITY OF BULLS SPERMATOZOA

**B.P. Widiarso and J. Daryatmo**

## ABSTRACT

*Research on the effect of bamboo leaves on motility of bulls spermatozoa aims to determine the content of active substances in the leaves of green bamboo (Bambusa vulgaris), knowing motility of spermatozoa of bull in bamboo leaf infusion as a result of the provision and analysis of sperm motility by comparing with the Indonesian National Standard (SNI) bull semen quality. The research material includes tools and materials used during the research tools used are: bovine artificial vagina, inner liner, pump, water bath, deck glass, glass objects, haemocitometer, microscopes, stopwatch, counter check, oven, erlenmeyer flask, electronic scales and pipette. The materials used are bamboo leaf infusion, bulls semen, Physiological NaCl 0.5 %, eosin-nigrosin staining for spermatozoa, filter paper and a plastic bag. Bovine semen samples taken using an artificial vagina at 4 stud cows with various strains and repeated 4 times repeat at intervals of one week. Samples that have been collected subsequently taken one drop of sperm motility and examined under a microscope to control. In the treatment of semen samples taken one drop, then sprinkled with a drop of bamboo leaf infusion each concentration of 1%, 5%, 10% and 20%, subsequently observed percentage motility of the spermatozoa. Observations are recorded and tabulated. The results showed that bamboo leaves can lower sperm motility due to lowered activity of the testes and epididymis, the addition of bamboo leaf infusion on spermatozoa cows were able to lower the sperm motility and the higher concentration of bamboo leaf infusion is added to the spermatozoa, the rate of decline in sperm motility will be higher.*

*Keywords : Bamboo leaves, semen, Beef cattle*

## INTRODUCTION

The main target of beef cattle breeders are getting the maximum benefit from doing farm activities. This advantage can be obtained from Beef cattle weight gain and quality of meat produced. Basically all nationalities and types of cattle can be fattened. However, to get maximum results breeder should be able to take into account the results already obtained (sale of livestock) with the cost (purchase of cows, feed, operating costs). In general, cows are profitable cows are indeed fast growth rate, good and high-quality meat. To get it is not easy, farmers are required to have the knowledge, experience and skills.

One of the criteria in the selection of superior cows are cows Nations and genetic properties. Each nation has a cow genetic properties different, both the flesh, or the ability to adapt to the environment such as climate adaptation and adjustment of feed . According to the theory, the superior cows as beef cattle is the type: Hereford, Aberdeen Angus, Beefmaster, Charolais, etc., which usually must be imported from abroad. The cows of this type can result in carcass percentage over 60%. While local species such as cattle Bali, Madura, Ongole, carcass percentage is always lower than the above types of cattle. However, in practice the kind of superior cows is not popular among the traditional farmers in Indonesia. Breeding cattle imports are often not able to meet the expected target. This opinion is true, but the main cause is sometimes not as bad seeds, but the discrepancy climate where the cows were bred, maintenance techniques and low quality feed.

Climatic differences between the regions of origin to the new environment makes imported cows have to fight extra hard to adapt to the stress and ultimately affect the severity of growth. Not to mention the problem of ignorance about the difference in treatment between the breeder cattle imports with local cattle. Similarly, the feed , the quality is different from the daily feed consumed is imported cows. In the end, farmers will not be able to generate profits could even lose money.

Feeding by the breeder done by considering the existing feed stocks. Forage forage needs not only using elephant grass, grass field sometimes banana leaves, banana weevil, cassava leaves and bamboo leaves. Bamboo leaf feeding on cattle basically have a high palatability value, but still unknown is the effect of feed on sperm motility in male cattle.

**Theoretical basis**

Ethanolic extract of leaves of bamboo (Bambusa arundinaceae) led to decreased fertility in male rats. The number of spermatozoa and motility soermatozoa taken from the cauda epididymis decreased. Additionally Ethanolic extract of bamboo leaves can also lower the testes, epididymis, vas deferens and prostata gland (Vanithakumari et al., 1989).

Results of laboratory tests of bamboo leaf extract content (Bambusa vulgaris) include: alkaloids, tannins, phenols, glycosides, saponins, flavonoids and anthraquinon. Extract the bamboo leaves are abortive which when administered in rabbits at a dose of 250 mg/kg body weight showed 50% experienced abortion pregnant female rabbits, but when given at a dose of 500 mg/kg body weight of 100% pregnant female rabbits undergo abortion (Moses et al . , 2009)

Research shows bamboo leaves contain many active substances, namely flavonoids, polysaccharides, chlorophyll, amino acids, vitamins, microelements, and so on, so it is good to lower blood fats and cholesterol. Also believed to reduce oxidation or free radicals, as antiaging ingredients, and is able to maintain stamina and prevent cardiovascular disease (Purwo, 2010).

Test fractions hypoglycemic effect of ethanol extract of leaves and yellow bamboo shoots (Bambusa vulgaris Schard) on male white mice by Yozy Yaznil of Andalas University. The experimental results indicate that the polar fraction extract of leaves and yellow bamboo shoots have hypoglycemic effects. Hypoglycemic effect given by the polar fraction extract of bamboo shoots a dose of 300 mg / kg bw . not significantly different compared with kloropropamid dose of 32.5 mg / kg bw

Have investigated the chemical constituents of bamboo shoots (Bambusa vulgaris Schrad, ex. Wendl., Poaceae). Phytochemical screening showed the presence of flavonoids and steroids/triterpenoids in dried bamboo shoots. From ethanol-water extract of fresh bamboo shoots have been found flavonoids, phenolic acids and other phenolic compounds. Flavonoids are identified as 4, 3', 4'-trihydroxy Auron 6-glucoside. Phenolic acids consist of the free phenolic acids p- hydroxy benzoic acid and acid vanilat; the glycoside form phidroksi benzoic acid, acid and acid vanilat siringat; form of the acid esters of p-hydroxy benzoic acid and vanilat. Other phenolic compounds suspected as p-hidroksibenzaldehida . Of n- hexane extract of dried bamboo

shoots isolated steroids/triterpenoids suspected as stigmasterol (RI Department of Health, 2000)

The content of *E. variegata* fitoldaun compounds derived compounds 3,7,11,15-tetramethyl-2-1-ol heksadeken showing antifertilitas activity against *R. norvegicus* spermatozoa in vitro at doses of 0.25 x 10-3µg/µL . Isolated active compounds , may decrease the motility and viability , as well as increase sperm abnormalities in mice ( Herlina, 2006)

## MATERIALS AND METHODS

### Materials

The research material includes tools and materials used during the research tools used were: bovine artificial vagina, inner liner, pump, water bath, deck glass, glass objects, haemocytometer, microscopes, stopwatch, counter check, oven, erlenmeyer flask, scales elekrik and pipette. The materials used are bamboo leaf infusion, cement bulls, Physiological NaCl 0.5%, eosin-nigrosin staining for spermatozoa, filter paper, and plastic crackle.

Motility examination conducted research in the Laboratory of Reproductive STPP Magelang using 4 heads of cattle stud with strains limousine bamboo leaf sampling at the origin can be of three locations Rukun Tani farmer group Seketi Sawangan, farmer group Eko Waluyo Siangan Kebonagung Tegalrejo and in Japan village.

### Methods

**Sampling methods**

Bull semen sample taken using artificial vagina at 4 oxen, rams with various strains and repeated 4 times repeated with intervals of one week. Samples are collected further taken one drop of spermatozoa and examined under a microscope motilitasnya to control. The behavior of samples taken one drop of semen, then drop in with one drop of bamboo leaves infusa each concentration of 1%, 5%, 10% and 20%, further observed spermatozoanya percentage motility. The results are recorded and tabulated.

**Data collection**

The collection of primary data can be obtained with a laboratory test for the amount of leaf bamboo (Bambusa vulgaris) and bull semen collection to examine the motility of spermatozoa. Secondary data from the search results data can rekording cattle and cattle data in clusters as a research partner.

**Pembuatan Infusa daun Bambu**

The crude dried bamboo leaves diserbuk with subtlety degree 5/8 then weighed dry powder of bamboo leaves 10 grams plus 100 ml aquades.Campur simplicia subtle degrees of matching in a saucepan with water to cover, heat on water for 15 minutes tangas calculated from temperature reaches 90$^{o}$C while every once in a while in the mixture. Serkai flannel while warm through, add enough hot water through the grounds to obtained the desired volume infusa

**Research Variables**

The variables studied were the quality of sperm motility of spermatozoa cover (%), sperm concentration (x10$^{6}$ cells/ml) and sepermatozoa viability (%) bulls.

**Data Analysis**

Motility data that has been collected analyzed descriptively by comparing the sperm quality standards. To distinguish the effect of bamboo leaf infusion between treatments were analyzed using analysis of variance (ANOVA).

## RESULTS AND DISCUSSION

The purpose of this research is to know the content of active substances in the leaves of green bamboo (Bambusa vulgaris), knowing the quality of bull semen in granting infusa bamboo leaves covering the motility of spermatozoa, concentration and percentage of live spermatozoa, and spermatozoa quality analysis by comparing with the Standard Nasional Indonesia (SNI) bull semen quality. From the results of the analysis and observations obtained findings as below.

**Bamboo (Bambusa vulgaris) Leaves Composition**

Bamboo leaves contains compounds phytol E. variegata leaf derived compound that is derived diterpen asiklik compound 3,7,11,15-tetramethyl-2-heksadeken-1-ol which showed activity against spermatozoa R. norvegicus fertility effect in vitro at doses of 0, 25 x 10-3 g / µL. Active compounds have been isolated, can reduce the motility and viability, as well as increasing abnormality rat spermatozoa.

**Table 1.** Average motility spermotozoa cows after coupled with bamboo leaf infusion concentration within 0 minutes

| Infusion concentration (%) | Sperm motility (%) | Sperm motility SNI/PTM (%) |
|---|---|---|
| 0 | 86.67 ± 2,89[a] | 80-85[b] |
| 1 | 58.33 ± 7.64[a] | 80-85 [a] |
| 5 | 60.00 ± 8.67[a] | 80-85[a] |
| 10 | 53.33 ± 5,78[a] | 80-85[a] |
| 20 | 53.33 ± 5,78[a] | 80-85[a] |

[a,b] Different superscripts indicate a significant effect (P<0,01)

From the above table it is known that the addition of bamboo leaf infusion has a significant effect (F count> F table, P <0.01) against bull sperm motility. However, when compared with the data in accordance with SNI or Minimum Technical Requirements (PTM) with the addition of bamboo leaves far below the rate of sperm motility sperm motility by SNI or PTM

**Tabel 2.** Average motility spermotozoa cows after coupled with bamboo leaf infusion concentration within 0 minutes

| Infusion Concentration (%) | Sperm Motility (%) |
|---|---|
| 0 | 86.67[a] ± 2,89 |
| 1 | 58.33[b] ± 7.64 |
| 5 | 60.00[b] ± 8.67 |
| 10 | 53.33[b] ± 5,78 |
| 20 | 53.33[b] ± 5,78 |

[a,b] Different superscripts indicate a significant effect (P<0,01)

From the above table it is known that the addition of bamboo leaf infusion has a significant effect (F count> F table, P <0.01) against bull sperm motility. The data illustrates that the addition of a bamboo leaf infusion can lower sperm motility.

**Tabel 3.** Average motility spermotozoa cows with various concentrations of bamboo leaf infusion

| Sperm motility after | 0 minute | 15 minute | 30 minute | 45 minute | 60 minute |
|---|---|---|---|---|---|
| Control (0%) | 86.67 | 86.67 | 80.00 | 80.00 | 71.67 |
| 1% | 58.33 | 46.67 | 41.67 | 36.67 | 25.00 |
| 5% | 60.00 | 45.00 | 30.00 | 20.00 | 11.67 |
| 10% | 53.33 | 45.00 | 30.00 | 16.67 | 5.00 |
| 20% | 53.33 | 46.67 | 30.00 | 13.33 | 3.33 |

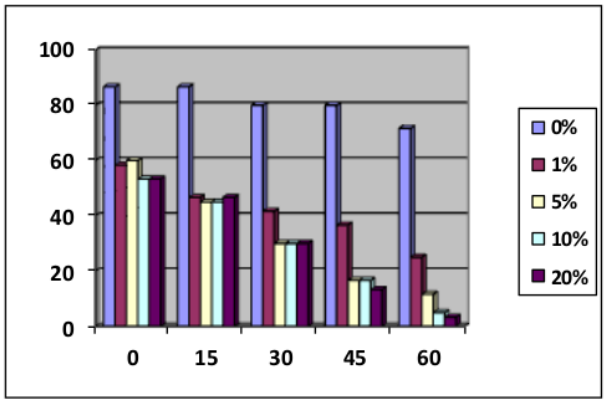


**Figure 1**. Average motility spermotozoa cows with various concentrations of bamboo leaf infusion

From the table above in mind that the overall increase infusa bamboo leaves have a significant influence (F Calculate > F table : P<0.01) on the motility of bull spermatozoa. These data illustrate that the addition of bamboo leaves infusa able to reduce the motility of spermatozoa . Inspection time difference motility of spermatozoa in sekeluruhan also have a significant (P < 0.01). In further experiments known about that every difference is a 15 minute inspection motility of spermatozoa have a significant difference between control and treatment. Each 15- minute additions will reduce the motility of spermatozoa was significantly (P<0.05) . Concentration infusa bamboo leaves also have a significant influence on the motility of spermatozoa (P< 0.05). The higher the concentration infusa higher bamboo leaves will turn the declining motility of spermatozoa .

The decrease motility of spermatozoa by the addition of bamboo leaves infusa known fertility effect from the oxy compound 3,7,11,15-tetramethyl-2-heksadeken-1-ol. Concentration is also contained in the leaves dadap chicken (Herlina, 2006) . There is a decrease in motility of spermatozoa from bamboo leaves infusa illustrates that oxen given additional feed will reduce the libido of the bull , thus increasing the appetite is further able to increase daily weight cattle. Weight gain will affect the daily cattle ranchers because of the increased income earned total meat increased. Besides the ethanolic extract of bamboo leaves can also decrease the motility of spermatozoa due to

lower activity of testes, epididymis, vas deferens and protata gland (Vanithakumari et al., 1989) .

## CONCLUSION

1. Bamboo leaves contain compounds 3,7,11,15-tetramethyl-2-1-ol heksadeken-containing substances antifertilitas
2. Bamboo leaves containing Ethanolic extracts that can reduce sperm motility due to lowered activity of the testes and epididymis.
3. Additions bamboo leaf infusion on bovine sperm motility were able to derive
4. Higher concentration of bamboo leaf infusion is added to the spermatozoa will be higher the rate of decline in sperm motility.
5. Studies are re-infusion at a dose range of bamboo leaves with fewer numbers.
6. Efficacy studies are bamboo leaves on cows to determine the extent of the effects of substance antifertilitas in bamboo leaves against the reproductive cycle.

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