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Improving Sperm Quality IMPROVING SPERM QUALITY OF JAWARANDU GOATS WITH VITAMIN E AND L-CARNITINE Sri Suharyati, Siswanto, Madi Hartono, and Kusuma Adhianto*) Department of Animal Husbandry, Faculty of Agriculture, University of Lampung Jl. Prof. Dr. Soemantri Brojonegoro No.1 Gedong Meneng Bandar Lampung 35145 Telp. (0721) 704946, Fax. (0721)770347 *) coresponding author:

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IMPROVING SPERM QUALITY OF JAWARANDU GOATS WITH VITAMIN E AND L-carnitine ABSTRACT Fertility of goat can be seen from various parameters of sperm quality. Good sperm quality is very influential on reproductive efficiency. Vitamin E

5**plays a role in male fertility because it**

can increase testicular weight, increase sperm count or concentration, increase sperm motility, and vitality. L-carnitine is an amino acid compound and is able to provide energy so that it can help improve sperm quality.

23**The objectives of this research were to find out** sperm quality **of**

Jawarandu goats after

1**administration of vitamin E** and **L-carnitine. The**

research used 16 Jawarandu male goats,

34**with a completely randomized design (CRD**) using 4 **treatments**, control (P0), administration **of**

vitamin E 50 IU (P1), administration of L-carnitine 50 mg (P2) and administration of a combination of vitamins E 50 IU and L-carnitine 50 mg (P3). The data from the research on sperm consistency and mass motility were analyzed descriptively, while the volume, individual motility, concentration, and percentage of live sperm

24**were analyzed using analysis of variance ANOVA. The results showed**

that the

1**administration of vitamin E and L-carnitine**

exerted

14**a very significant effect** on motility (**P<0.01), the** concentration **and** percentage **of**

live sperm (P<0.05) but not effected the sperm volume and abnormalities (P>0.05). In conclusion the combination of

1**vitamin E and L-carnitine** gave **the best** results **on the** sperm quality **of the**

Jawarandu Goat. Keywords: Jawarandu Goat, sperm quality, vitamin E, L-carnitine INTRODUCTION Goat is one of the livestock that plays a major role in meeting the meat needs of the community which is currently always increasing along with the increase in population and increasing public awareness about the importance of protein, including animal protein for growth and brain development so that livestock populations including goats need to be increased. In addition, goats are also suppliers of meat and milk to support the national food security program. Therefore, it is very important to make efforts to accelerate the increase in the goat population. The natural increase in population is strongly influenced by reproductive performance. Reproductive performance is reflected in several parameters, for male cattle is sperm quality, while for female cattle such as age of puberty, age at first mating, postpartum estrus, post partum mating, litter size, and survival of offspring until weaning (Sodiq and Abidin, 2012). Increasing the population and productivity of goats is the main goal of goat maintenance and this can only be done if the reproductive performance goes well or the level of livestock reproduction efficiency is high, but there are always problems in livestock development, one of which is the low reproductive performance which results in the increase in livestock population being low. Sperm is one of the factors

37**that play an important** and very decisive **role in the** success **of**

mating in goats. Sperm quality inhibit fertilization, causing pregnancy failure. The results of Susilawati (2011) showed that sperm quality with 30-40% motility resulted in a higher pregnancy rate than 5- 20% motility. In addition, the results of Fatah et al. (2018) showed that sperm quality showed a very significant relationship to the success of pregnancy. Vitamin E is an important vitamin in ruminant nutrition which is not synthesized by rumen microbes. This vitamin is also called the anti-sterility vitamin or vitamin for fertility and functions as antioxidant and as a protective cell membrane, food substances such as vitamin A and 3 unsaturated fatty acids so as to avoid damage due to the oxidation process. Vitamin E deficiency causes gonadal atrophy and inhibits the formation of sperm cells, and causes infertility in male animals. Vitamin E has various functions, biochemically the function of vitamin E is as a coenzyme and biologically it functions as an antioxidant that protects sperm cell membranes so that it can help penetrate egg cells (Tillman et al., 1991).

3**Vitamin E is** a **line of defense against** the **peroxidation of polyunsaturated fatty acids** present **in cellular and subcellular** membranes. **Vitamin E acts as an antioxidant** by **breaking free radical chain reactions as a result of its ability to transfer phenolic hydrogen to peroxyl free** radicals and **peroxidized polyunsaturated fatty**

acids (Mayes, 1995). According to Winarno (1997), antioxidants are materials used to prevent fat oxidation. Antioxidants are effective in preventing peroxidation by providing hydrogen to free radicals. In sperm cells, the effect of peroxidation causes loss of sperm motility, inhibits fructolysis and respiration, releases trans-cellular enzymes and damages the plasma membrane, especially for the acrosome (Combs, 1992).

25**In addition to** functioning **as an antioxidant, vitamin E also**

41**plays a role in the** reproductive **process**

, namely preventing testicular degeneration. Vitamin E deficiency in animals can cause muscle weakness, stunted growth, embryonic degeneration, low egg hatchability, degeneration and release of testicular germinative epithelial cells, infertility, decreased hormone from the testes, decreased cell permeability, spur death and nerve (Lehninger, 2003). 1993). L-carnitine is a form of amino acid that is produced naturally in the body or can also be obtained from certain foods and supplements. L-carnitine has various benefits for the body. However, you need to know the safe dosage for consumption so as not to cause adverse side effects.

12**L-carnitine** has **an important role in** producing **energy**, namely **by** carrying **fatty acids into the mitochondria**

in body's cells. Mitochondria then act as fat-burning machines to create energy that the body can use 4 for activities. In addition, L-carnitine is also useful in many processes in the body, such as heart and brain function, and muscle movement. Several studies have shown that taking L-carnitine supplements regularly can improve sperm quality, increase sperm count, and maximize sperm motility (Elokil et al., 2019). The addition of L-carnitine to feed has a positive potential to increase growth and fat catabolism (Chatzifotis and Takeuchi, 1997).

20**L-carnitine plays** a **role in** the **metabolic**

intermediates required to oxidize

20**long-chain fatty acids** in **the mitochondria**

which produce metabolic energy (Owen et al., 2001).

21**L-carnitine also plays a role in regulating** the **CoA/CoA**-SH **ratio**

which is important in carbohydrate and fat catabolism (

36**Chatzifotis et al., 1996; Vaz et al., 2002**

). Until now, a lot of research has explored the production performance, while research on reproductive performance, especially the quality of goat sperm, has not been done much. High and low reproductive performance for males can be determined by assessing sperm quality. Information on livestock reproductive performance is needed as a basis for further reproductive management. Livestock productivity is closely related to performance. Reproductive performance is an expression of reproductive characteristics, therefore it is necessary to explore information about reproductive performance so that efforts can be made to improve reproductive efficiency in livestock.

13**The purpose of this study was to determine the** sperm quality **of**

Jawarandu goats after

1**administration of vitamin E and L-carnitine**

.

39**MATERIALS AND METHODS Materials The materials used were**

16 heads of Jawarandu male goats, aged approximately 2 years that weigh about 25 kg. The basal feed was consisted of corn, cassava leaf silage, pollard, coffee husk, cassava flour, copra meal, oil palm cake, molasses, salt, vitamin E (alpha tocopherol), and L-carnitine. This research took place during June and July 2021

22**in Rejo Asri Village, Seputih Raman District, Central Lampung Regency**

,

13**Lampung Province. The** research **design used was a completely randomized design (CRD) with** four **treatments**

: P0 = control P1 = vitamin E 50 IU/head/day P2 = L-carnitine 50 mg/head/day P3 =

35**vitamin E 50 IU**/head/**day and** L-carnitine 50 **mg**/head/**day**

Research in cages was carried out for 45 days (10 days of adaptation and 35 days of treatment). Goats are housed in individual cages and given rations as needed that goat were equally divided into four groups. Feed analysis data are in Table 1. Drinking water is given in free quantities (ad libitum).

18**Vitamins E and L-carnitine** were given orally **in the**

morning. A mixture of

18**vitamins E and L-carnitine** is given **in**

capsule form according to the treatment dose. Sperm collection was carried out twice, namely before and after treatment. Semen collection was performed using an artificial vaginal method (Toelihere, 1993). Semen that is collected is immediately checked for quality which includes volume, motility (movement), concentration, percentage of live sperm and percentage of abnormalities. Table 1.

19**Nutrient content of feed** used **Composition Dry Matter Crude Protein Extract Ether Ash** Crude Fiber % (DM) **Content**

81.39 18.36 11.69 13.62 12.98 Remarks: results of feed analysis (Nutrition and Animal Feed Laboratory, 2021) Parameters a. Volume Volume of semen (ml) that is accommodated in each ejaculation or each collection and can be read directly on the collection tube. b. Sperm Motility Examination of sperm motility or motility is used as a basis for determining the ability to fertilize an egg. Sperm motility examination includes mass movement and individual movement. To determine the mass movement is done by dripping a drop of sperm on the object and examined using

15**a microscope with a magnification of** 10 **times**. For individual movements, **sperm was**

dripped onto glass an object and

27**covered with a cover and** then examined **using a microscope with**

a magnification of 40 times. Motility assessment was based on Toelihere (1993). c. Semen Concentration Concentration was calculated using a haemocytometer by sucking semen with a pipette to the 0.5 mark then sucking the physiological NaCl solution up to the 101 mark, then shaking until homogeneous and discarding a few drops. The calculation is done by dripping the mixture into the counting chamber which has been given a cover glass. According to Toelihere (1993), semenconcentration is calculated by the formula: Y = Z x

400/80 x 200/0,1 description: Y: semenconcentration (million cells/ml) Z: number of semencells counted 400: number of small squares in counting room 80: the number of small squares from the five counted boxes 200: the number of dilutions d. Percentage of live sperm Sperm examination was carried out by differential staining using eosin and smear preparations were made and then observed using

15**a microscope with a magnification of** 40 **times**. Live **sperm**

are transparent and dead sperm are dark red. According to Toelihere (1993), the calculation of the percentage of live sperm is carried out using the formula: Y - X Percentage of live sperm = ---------- x 100% X Description: Y: the number of sperm counts X: the number of dead sperm e. Abnormal sperm percentage Observation of abnormal sperm (abnormal morphological shape) was carried out on the smear preparations that had been made.

4**Observations were made** using **a microscope with** a **magnification of**

40 times. According to Toelihere (1993) to calculate the percentage of abnormal sperm: D Percentage of abnormality: ---------- x 100% C Description: C: counted sperm count D: abnormal sperm count Sperm Quality data for consistency and mass motility were analyzed descriptively, while for volume, concentration, individual motility and percentage of live

2**spermatozoa were analyzed using analysis of variance and continued with**

BNT test at 5% and or 1% level for significantly different variables (Steel and Torrie, 1991).

4**RESULTS AND DISCUSSION** Semen volume **The results showed that** the average volume **of**

Jawarandu Goats for each treatment was 0.75±0.28 ml (P0); 0.78±0.32 ml (P1); 1.05±0.90 ml (P2); and 1.1±0.68 ml (P3) with an average of 0.93 ml. The volume of sperm can be seen from the volume contained in the sperm tube. Data on the average volume of Jawarandu Goats

14**can be seen in Table 2. The results of the** analysis **of**

variance in semen volume of the Jawarandu Goat showed that the

1**administration of vitamin E and L-carnitine**

had

2**no significant** effect (**P>0.05). The volume of** semen **produced**

is influenced by the accessory glands. Some of these accessory glands consist of the seminal vesicles (vesicularis), prostate and bulbourethral (couper's glans) glands. The vesicular glands produce the largest portion of semen plasma compared to the secretions of other sex accessory glands. The volume of ejaculate in livestock can vary according to the degree of maturity of the male animal and more specifically with the

duration of oestrus stimulation and the frequency of holding (Hunter, 1995). The results of this study are good and in accordance with Toelihere (1993), which states that normal goat semen has a volume between 0.7--3.0 ml; while Hardjopranjoto (1995), stated that the volume of goat semen ranged from 0.25-1.25 ml. The results of this study are not much different from the results of research by Suharyati and Hartono (2013) on Boer goats which produced a volume of 0.77-1.13 ml but higher than the results of Sutriana et al. (2020) which shows the volume of semen in Boerka goats from 0.7 to 0.9 ml. Figure 1

> 4**shows that the average** volume **of** semen produced **in the** combination **treatment**

> 1**of vitamin E and L-carnitine** (P3) resulted **in**

a higher volume than P0, P1 and P2, it is related to the function of vitamins E and L-carnitine. Vitamin E

> 5**plays a role in male fertility because it**

can increase testicular weight, increase sperm count and motility. Vitamin E

> 5**plays a role in male fertility because it**

can increase testicular weight, increase sperm count and motility (Anggorodi, 1994).

> 8**L-carnitine is a** compound **that plays** a **role in**

converting fat into an energy source so that it can improve sperm quality. According to Owen (2001), L-carnitine plays a

> 10**role in the** transfer **of long-chain fatty acids across the inner mitochondrial membrane. L-carnitine**

functions as an intermediary in metabolic processes, having

> 9**a major role in the formation of acyL-carnitine esters** from **long-chain fatty acids. The**

results showed

> 9**a positive relationship between** early **sperm** motility **and increased LC in** the **epididymis and L-acetyl in sperm**

(Ahmadi et. al., 2016). Semen Consistency The consistency of Jawarandu Goat semen given

> 1**vitamin E, L-carnitine and a combination of**

vitamins E and L-carnitine was relatively thick, however in the untreated group it had a runny consistency. consistency data from the

4research can be seen in Table

3.

4Based on Table 3, it can be seen that the administration of

1Vitamin E and L-carnitine (P1; P2: P3) showed

a thick consistency compared to the control. The thick consistency of the Jawarandu Goat semen is because the Jawarandu Goat semen obtained has a high concentration level. The concentration of spermatozoa produced by Jawarandu Goats given vitamin E and L-carnitine shows a higher concentration. According to Lubis., et. al. (2013), consistency is the degree of viscosity that is closely related to the concentration of spermatozoa. Consistency assessment can provide an overview of the concentration of spermatozoa contained in the semen. Kartasudjana (2001) also stated that consistency or viscosity is one of the characteristics of sperm that has a relationship with 10 the concentration of spermatozoa in it. The thicker the sperm, the higher the concentration. Sonjaya et al. (2005) stated that the degree of viscosity of semen has a positive correlation with the content of spermatozoa in the semen so that if the semen is found to be too dilute, it can be assumed that the semen has a low concentration of spermatozoa and vice versa. Administration

16of vitamin E and L-carnitine will increase the production of

spermatozoa cells, this is because vitamin E functions as an antioxidant and

5plays a role in male fertility because it

can increase testicular weight, increase count and motility (Anggorodi, 1994).

8L-carnitine is a compound that plays a role in

converting fat into an energy source, thereby increasing the availability of energy for the formation of spermatozoa cells. According to Owen (2001), L- carnitine plays a

10role in the transfer of long-chain fatty acids across the inner mitochondrial membrane. Semen Concentration The spermatozoa concentration of

Jawarandu Goat after being treated with

1Vitamin E and L- carnitine is presented in

Table 4. The results showed that semen concentration ranged from 1,910 to 3,290 million/ml with an average of 2,611.88 million /ml. The average concentration of semen in this study was higher than the results of the study by Husin

> 2**et al**. (2007) **which** showed **that the** concentration **of spermatozoa in** Nubian **goats**

was 2,546.67 ± 130.51 million/ml and the results of Sutriana et al. al (2020) which resulted in a concentration in Boerka goat of 2,405.56 million/ml.

> 6**The results of the analysis of variance showed that the** administration **of** vitamin E **and** L-carnitine showed **a** significantly different **effect (P<0**.05) **on**

the semen concentration of the Jawarandu Goat. The results of LSD further test showed that the administration of a combination of

> 1**vitamin E and L-carnitine was** different from **the** administration **of**

L-carnitine and control but not different from the administration

> 16**of vitamin E and L-carnitine The** combination **of**

> 1**vitamin E and L-carnitine** produces **the**

highest concentration. Administration

> 40**vitamin E and L-carnitine** will increase **the** production **of**

spermatozoa cells. According to Church (1983), vitamin E can prevent the regeneration of cells in the testes. Anggorodi (1994) stated that vitamin E functions as an antioxidant. Antioxidants are effective in preventing peroxidation by providing hydrogen to free radicals. Further, Ogbuewu et al. (2010) stated that

> 2**vitamin E** was **able to prevent damage to spermatozoa in male cattle and maintain** zygote **development** in female goat. **In the process of spermatogenesis, vitamin E functions as an antioxidant**

capable of neutralizing free radicals resulting from aerobic metabolism. Sperm Mass Motility Motility or motility of spermatozoa can be assessed immediately after storage and is generally used as a measure of the ability to fertilize a semen sample Mass motility on

> 1**administration of vitamin E, L-carnitine**, or **the**

1**combination of vitamin E and L- carnitine**

showed better motility than the control, this was due to the vitamin E content given to increase sperm motility (Anggorodi, 1994). Giving L-carnitine will cause an increase in the energy produced, this is because

8**L-carnitine is a** compound **that plays** a **role in**

converting fat into an energy source so that it can provide more energy. According to Owen (2001), L-carnitine plays a

11**role in the transfer of long chain fatty acids across the inner mitochondrial membrane**

. Individual Motility of Sperm The results of the study of administering

1**vitamin E and L-carnitine on**

individual motility are presented in Table 5 and Figure 3. The average individual motility ranged from 72.50 to 83.75% 12 with an average by 78.13%.

29**The results of this study are** higher than **the results of**

Kostaman and Sutama (2006) which showed the results of sperm motility of Boer Goats were 71.67% and 73.33%, respectively. The

7**results of the analysis of variance showed** that there was **a very significant effect (P<0.01). The** results **of the**

BNT further test showed that the administration of a combination of

1**vitamin E and L-carnitine was** different from **the** administration **of**

L-carnitine and control but not different from the administration of vitamin E.

5**Plays a role in male fertility because it**

can increase testicular weight, increase sperm count and motility (Anggorodi, 1994). The addition of vitamin E can increase fertility (

33**Iriyanti et al., 2007; Wahyuni et al., 2011**

).

8**L-carnitine is a** compound **that plays** a **role in**

converting fat into an energy source, thereby increasing the availability of energy for the formation of spermatozoa cells. According to Owen (2001), L-carnitine plays a

11**role in the transfer of long chain fatty acids across the inner mitochondrial membrane**

. Motility is closely related to the level of fertility or fertility. The percentage of live sperm The results of the study of the

1**administration of vitamin E and L-carnitine**

2**on the percentage of live** sperm **of the** Jawarandu **goat** are presented **in Table**

7 and Figure 4. The average percentage of live spermatozoa ranged from 96.05 to 99.64 % with an average of 97.84%. This result is very good, according to Hardjopranjoto (1995) the number of viable spermatozoa is not less than 85%.

7**The results of the analysis of variance showed** that there was **a significant effect (P<0**.05). **The** results **of the**

BNT follow-up test showed that the combination

1**administration of vitamin E and L- carnitine**

was different from that of the control group but did not differ from the

1**administration of vitamin E and** the administration of **L-carnitine**

. 13 The administration

1**of vitamin E** and **L-carnitine** showed **a** higher percentage **of**

live sperm, this was because the administration of

32**vitamin E and L-carnitine** caused an increase **in** antioxidants **in the**

goat's body. According to Dutta-Roy et al. (2004),

17**vitamin E is an antioxidant** that **protects polyunsaturated fatty acids** (PUFAs) and **cell** components and cell **membranes from free radical**

oxidation.

30**Vitamin E acts as an antioxidant** and can protect **against** the action **of**

damaging biological membranes due to

38**free radicals. Vitamin E protects unsaturated fatty acids**

in phospholipid membranes such as the membranes of sperm cells, while being able to provide more energy for spermatozoa to live. According to Owen (2001),

12**L-carnitine** has **an important role in** producing **energy**, namely **by** bringing **fatty acids into the mitochondria**

in the body's cells. Mitochondria then act as fat burning machines to create energy. Figure 4 shows that the percentage of live spermatozoa from this study was very good because this result was higher than the results of Kostaman and Sutama (2006) which showed the results of live spermatozoa in goats. Boer goats ranges from 77-79%, the results of research by Suharyati and Hartono (2013) on Boer goats are 86.67%, and the results of research by Sutriana et al. (2020) on the Boerka goat by 79%. Percentage of Sperm Abnormalities The percentages of sperm abnormalities resulting from the study are presented in Table 8 and Figure 5.

6**The results of the analysis of variance showed that the** administration **of** vitamin E **and** L-carnitine **had** no **significant effect (P>0**

.05), but these results classified as very good because the percentage of abnormalities obtained is very low (average 0.82%). Hardjopranjoto (1995) stated that sperm is considered good if the number of abnormal shapes does not exceed 5%. The results of this study 14 indicate a lower level of abnormality than the research of Kostaman and Sutama (2006) which showed sperm abnormalities in Boer Goats of 7.55% and the results of Suharyati and Hartono's research (2013) on Boer Goats showed sperm abnormalities of 1.61%. Figure 5 shows that the

1**administration of vitamin E** and **L-carnitine** resulted in **the**

smallest abnormalities. This shows that the addition of vitamins E

28**and L-carnitine plays an** active **role in the** process **of**

spermatogenesis so that the spermatozoa produced in the seminiferous tubules have a low level of abnormality. The lower

26**the percentage of** abnormal **spermatozoa, the** higher the **quality of the** semen produced. This **is**

in accordance with the opinion of Toelihere (1993), which indicated that fertile sheep or goats should not contain more than 5-15% abnormal sperm. CONCLUSION Conclusion and Recommendation

31**The results showed that the administration of** vitamin E **and**

L-carnitine could increase motility, concentration and percentage of live sperm but had no effect on sperm volume and abnormalities. Vitamin E and L-carnitine each as much as 50 mg/head/day can be used for male goats to improve semen quality REFERENCES Ahmadi, S.,R. Bashiri, A.G. Anari and A. Nadjarzadeh. 2016. Antioxidant supplements and semen parameters: An evidence based review. int. J. Reprod.Biomed. 14(12): 729–736 Anggorodi, R., 1994. General Animal Feed Science. Gramedia. Jakarta. Chatzifotis, S. and. T. Takeuchi. 1997. Effect of supplementaL-carnitine on body weight loss, proximate and lipid compositions and carnitine content of red sea bream (Pagrus major) during starvation. J. Aquaculture. 158(1): 129-140 Chatzifotis. S., T. Takeuchi, and T. Seikai. 1996. The effect of carnitine supplementation on growth of red sea Bream (Pagrus major) fingerlings at two levels of dietary lysine. J. Aquculture 147:235-248 Church, DC. 1983. Digestive Physiology Nutrition of Ruminant. Vol.1 Ed. Corvali. Oregon. USA Combs, GF. 1992. Fundamental Aspect in Nutrition and Health. Academic Press. New York Dinas Peternakan Lampung. 2004. Declaration of Intensification of Goat Farming in Lampung Province, Tanggamus Regency, Talangpadang District. Report Ditbangnak. Lampung Dutta-Roy AK, Gorden MJ, Campbell FM, Duthie GG, & James WPT. 1994. Vitamin E requirements, transport, and metabolism: role of a-tocopherol binding proteins. J. Nutr. Biochem. Sci. 5:562 – 570. Elokil. A.A., A. A. Bhuiyan. H. Z. Liu, M.N. Hussein, H.I. Ahmed, S. A.Azmal L. Yang, S. Li. 2019. The capability of L-carnitine-mediated antioxidant on cock during aging: evidence for the improved semen quality and enhanced testicular expressions of GnRH1, GnRHR, and melatonin receptors MT ½. Poultry Science. Vol 98 (9):4172-4181 Fatah, K., D. Dasrul, and M.A.N. Abdullah 2018. Comparison of the Quality of Frozen Semen of Superior Cattle and Its Relationship with the Success Rate of Artificial Insemination in Aceh Cattle. Jurnal Agripet (18)1: 10-17 Hardjopranjoto, HS 1995. Proficiency in Livestock. Erlangga University Press. Surabaya Hunter, RHF 1995. Physiology and Reproductive Technology of Domestic Female Animals. DK Harya Putra translation. Bandung Institute of Technology. Bandung Husin, N., T. Suteky dan Kususiyah. 2007. Semen Quality Test of Nubian Goats and Their Breeds (Nubian X PE) and Boer Goats Based on Storage Time. Jurnal Sain Peternakan Indonesia 2(2):57- 64 Iriyanti, N., Zuprizal, T Yuwanta and S. Keman. 2007. Use of Vitamin E in Feed on Fertility, Hatchability and Hatching Weight of Free-range Chickens. Animal Production 9:36-39 Kartasudjana, R. 2001. Artificial Insemination Techniques in Cattle.

http://mirror.com/...ternak./tehnik_

inseminasi_pada_ternak.pdf. accessed 13 Februari (2021) Kostaman, T and IK Sutama. 2006. Study of motility and viability of Boer goat spermatozoa on fructose tris-citrate diluent. Jurnal Sain Veteriner 1:58-63 Lehninger. 1993. All Kinds of Vitamins.

www.articlesnatch.com/uk/Article/All-Types-Of-

Vitamin/417341-36k- accessed 18 Februari 2021 Lubis, TM, Dasrul, CN Thasmi, and T. Akbar. 2013. The effectiveness of adding vitamin C in the diluent of skimmed egg yolk on the sperm quality of Boer goats after cold storage. J. Sains Agriculture Sci. 3: 347-361 Mayes, PA. 1995. Structure and Function of Fat Soluble Vitamins. Medicine Book. EGC. Jakarta Ogbuewu, IP, NO Aladi, IF Etuk, MN Opara, MC Uchegbu, IC Ocoli,

and MU Iloeje. 2010. Relevance of oxygen free radicals and antioxidants in sperm production and function. Research J. Vet. Sci. (3):134-138. Owen, K.Q., C.V. Maxwell, J.L. Nelseen, R.D. Goodband, M.D. Tokach, and G.C. Tremblay. 2001. Dietary L-carnitine suppresesses mitochondrial branched-chain keto acid dehydrogenase activity and enhances protein accreation and carcass characteristic of swine. J. Amin. Sci., 79:3104- 3112. Sodiq, A., and Z. Abidin. 2002. Ettawa Goat Grade. 1Ed. Agro Media Pustaka. Tangerang. Sonjaya, H., Sutomo and Hastuti. 2005. Effect of the addition of calcium ionophore on sperm quality of Boer Goats produced by sexing. J. Sains & Teknologi. Sci. 5:23-31 Steel, R.G.D., and J.H. Torrie. 1991. Statistical Principles and Procedures. B. Sumantri translation. Gramedia. Jakarta. Suharyati, S and M. Hartono. 2013. Boer Goat Semen Quality Improvement With Vitamin E And Mineral Zn. Jurnal Kedokteran Hewan. 7 (2): 91-93 Susilawati, T. 2011. The Success Rate of Artificial Insemination With Different Quality And Semen Deposition In Ongole Breeds. J. Ternak Tropika. 12(2):15-24 Sutriana, A., F. Khoiriah, Husnurrizal, T.N. Siregar, Rasmaidar, and Herrialfian. 2020. Effect of PGF2α on Spermatozoa Quality Improvement of Boerka Goats. Acta Veterinaria Indonesiana. 8(3):15-21. 18 Toelihere, MR 1993. Artificial Insemination in Cattle. Angkasa. Bandung Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo, dan S. Lebdosoekojo. 1991. Basic Animal Feed Science. Gadjah Mada University Pres. Yogyakarta Vaz, F.M., B. Melegh, J. Bene, D. Cuebas, DAGace, A. Bootsama, P. Vreken, A.H.V. Gennip, L.L. Biebir, & R.J.A. Wanders. 2002. Analysis of carnitine biosynthesis metabolities in urine by HPLC-electrospray tandem mass spectrometry. Clinical Chemistry 48(6):826-834 Wahyuni, H.I, N. Suthama, I. Mangisah, and T.A. Sarjana. 2011. Egg quality and hatchability of in situ – reared kedu and cemani hens fed diet of farmer formulation supplemented with vitamin E. J. Indonesian Trop. Anim. Agric. 36:61-68 Winarno, F.G. 1997. Food Chemistry and Nutrition. Gramedia Pustaka Utama. Jakarta 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 1 2 5 6 7 8 9 11 15 16 17 19