

**THESIS**

**THE EFFECT OF  $\alpha$ -TOCOPHEROL SUPPLEMENTATION  
IN DILUENT TO SPERM MOTILITY, VIABILITY, AND  
PLASMA MEMBRANE INTEGRITY AFTER COOLING  
ON SIMMENTAL CATTLE**



**By:**

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SURABAYA  
2020**

**ENDORSEMENT FORM**

**THE EFFECT OF  $\alpha$ -TOCOPHEROL SUPPLEMENTATION IN DILUENT TO SPERM MOTILITY, VIABILITY, AND PLASMA MEMBRANE INTEGRITY AFTER COOLING ON SIMMENTAL CATTLE**

Research Proposal

Submitted in partial fulfillment of the requirement for degree of

Bachelor of Veterinary Medicine

at

Faculty of Veterinary Medicine, Universitas Airlangga

By

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Approval of

Supervising Committee,



Prof. Dr. Koesnoto Soepriananondo, MS., drh  
Co-Supervisor



Dr. Hermin Ratnani, M.Kes., drh  
Supervisor

## DECLARATION

Hereby, I declare that in this thesis entitled :

**THE EFFECT OF  $\alpha$ -TOCOPHEROL SUPPLEMENTATION IN DILUENT  
TO SPERM MOTILITY, VIABILITY, AND PLASMA MEMBRANE  
INTEGRITY AFTER COOLING  
ON SIMMENTAL CATTLE**

There is no other work ever published to obtain a college degree in a certain college and according to my knowledge there is also no work or opinion ever written or published by others, except those in writing referred to this paper and mentioned in the reference.

Surabaya, 3 February 2020



Sarah Azura  
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Has been assessed at the seminar of research result:

Date : 20 January 2020

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Supervisor : Dr. Hermin Ratnani, drh., M.Kes.  
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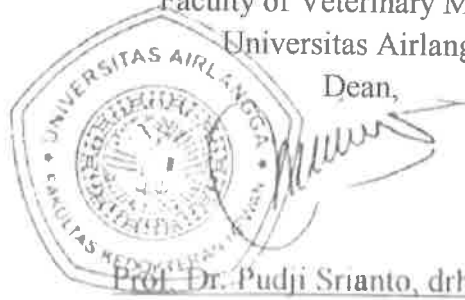
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## SUMMARY

SARAH AZURA. Research entitled “THE EFFECT OF  $\alpha$ -TOCOPHEROLSUPPLEMENTATION IN DILUENT TO SPERM MOTILITY, VIABILITY, AND PLASMA MEMBRANE INTEGRITY AFTER COOLING ON SIMMENTAL CATTLE” under the guidance The supervisor committee, Dr. Hermin Ratnani, M.Kes., drh. as the supervisor and Prof. Dr. Koesnoto Soepranianondo, MS., drh. as the co-supervisor

This study aims to analyze spermatozoa motility, viability and membrane integrity after adding alpha- tocopherol on simmental cattle and to find out the maintenance effect of alpha- tocopherol supplementation on spermatozoa qualities.. The study was conducted at Artificial Insemination Laboratory Faculty of Veterinary Medicine, Universitas Airlangga. The sample used was simmental cattle sperm with a total of 5 samples. Semen from every collection was divided into four groups. The groups consisted of one treatment control containing semen and diluent, and three treatments containing semen, diluent, and different dosage of alpha-tocopherol according to experimental groups as follows: 0 (control), 0.5 mM (T1), 1 mM (T2) and 1.5 mM (T3).

Analysis of Variance (ANOVA) one way used for analyzing the collected data, and continue with Duncan’s multiple range tests. The program Statistical Product and Service Productions (SPSS) 20 for windows used for data processing to know the result differences between every treatment.

Cooling process makes sudden outburst of ROS generation. Antioxidants such as alpha-tocopherol help clear the ROS produced by the electron transport chain in the mitochondria from creating a chain reaction in the cell membrane. Alpha-tocopherol inhibits the stage of lipid peroxidation propagation through the transfer of H atoms Results suggested that spermatozoa motility, viability, plasma

membrane integrity can be maintained by the supplementation.

. Based on the results of research conducted, from 4 dosage alpha-tocopherol supplementation there were positive results. 1,5 and 1 produced the highest significant result compared to other groups. It can be concluded that alpha-tocopherol at the concentration of 1.5 mM can be an efficient antioxidant supplement in egg yolk skim milk diluent for Simmental cattle semen. Suplemntation  $\alpha$ -tocopherol resulted beneficial effect on sperm motility, viability and plasma membrane in Simmental cattle.