

**OPTIMIZATION OF BIOFEED PLAN AND SPACE REQUIREMENT FOR  
RABBIT (*Oryctolagus cuniculus* L.)**

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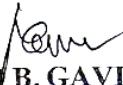
An Undergraduate Thesis Submitted to the Faculty of the Department of Agricultural and  
Biosystems Engineering, College of Engineering, Central Luzon State University,  
Science City of Muñoz, Nueva Ecija, Philippines  
in Partial Fulfillment of the Requirements  
for the Degree of

**BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS ENGINEERING  
(Bioproducts Process Engineering)**


**JUNE 2019**

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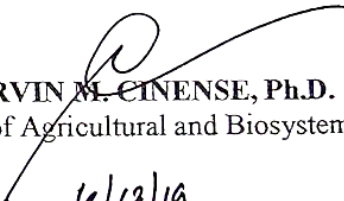
  
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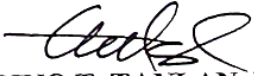
  
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## **BIOGRAPHICAL SKETCH**

John Vincent Abenoja Nate is the eldest child of Mr. Rafael L. Nate and Mrs. Amelia A. Nate. He was born on the 3<sup>rd</sup> day of September 1998 at Cabanatuan City, Nueva Ecija. He is currently living with his family at Brgy. Pulong Buli, Sto. Domingo, Nueva Ecija.

In year 2010, he finished his elementary education at Sto. Domingo Central School where he graduated as valedictorian. Four years after, he completed his secondary education at Sto. Domingo National Trade School (SDNTS). He graduated as salutatorian and achieved the National Certificate II (NC II) in “Electrical Installation and Maintenance” from TESDA (Technical Education and Skills Development Authority). In his tertiary education, he was given an opportunity to study under the assistance of PhilDev Foundation as one of their seven (7) undergraduate beneficiaries taking up Bachelor of Science in Agricultural and Biosystems Engineering (BSABE).

The researcher really intended to take up Bachelor of Science in Biology which is one of the pre-medical studies before taking up Medicine. However, due to various persuasions from reliable professionals introducing to him the opportunities in agriculture as well as tough engineering subjects such as Calculus and Strength of Materials, he ended up taking BSABE. Choosing this aforementioned course was one of the ways he found to challenge himself, since he was more academically inclined in biological sciences. Having various engineering subjects in the BSABE program gave him an enormous amount of learnings with the subjects that he used to not give an attention before.

Within his college career for the last ten (10) semesters, he became a university scholar thrice, college scholar for six (6) times and a dean's lister once.

As a student, the researcher participated in various seminars and activities such as “Symposium on Current Trends in Food Safety and Quality Assurance” held on August 30, 2014 at the University Gymnatorium, CLSU, Science City of Muñoz, Nueva Ecija; “PAESTIGAN VIII: The State Colleges and Universities National PAES Quiz Contest” under the “Animal Structures Design Making Contest” held of February 2-3, 2018 at the University of the Philippines, Los Baños, Laguna; and “Seminar on Basic Rabbit Raising” held on April 14, 2018 at Jabez Marketing Cooperative, Don Rafael Village, Brgy. Sibut, San Jose City, Nueva Ecija.

Elijohn Dela Cruz Natividad is the first-born child of Mr. George N. Natividad and Mrs. Zenaida DC. Natividad. He was born on the 14<sup>th</sup> of May 1998 at PJG, Cabanatuan City, Nueva Ecija and raised as a born again christian. He has no permanent residence and tends to change places whenever the situations asked him, but now he lives in Rufina IV, Sto. Nino 2<sup>nd</sup>, San Jose City, Nueva Ecija.

The researcher took up his elementary education in Jabez Accelerated Christian Academy and graduated in 2010. Later on, in high school days, he passed the entrance examination on San Jose City National High School (formerly known as Constancio Padilla National High School) for special science curriculum and graduated as a salutatorian for year 2014. The following academic year, in his tertiary education he was admitted in University of the Philippines Los Baños (UPLB), originally as a Bachelor of Science in Mathematics and Science Teaching. However, before the enrollment came, he realized that the country needs more food than teachers in the future, due to the upcoming food shortage that will hit in the years to come. Hence, he changed his course to Bachelor of Science in Agricultural and Biosystems Engineering (BSABE).

Fortunately, he was also blessed for being a scholar of the Department of Science and Technology (DOST). The researcher blended well on his stay at UPLB and became an honor roll and college scholar in one academic year. Then, the researcher decided to transfer at Central Luzon State University (CLSU) for he was convicted that the gains he was getting for studying at his former university were nothing compared to the loss of being distant from his family, friends and church.

In 2015, the researcher completed his transferee papers and studied in CLSU. Most of his taken subjects on UPLB were not credited, which resulted for him taking no vacations during mid-years to cope up and graduate on time along with his batchmates. He was also blessed to pass the CLSU alumni and AVON scholarships. He became a holder of three (3) scholarships in a year. Unfortunately, due to his negligence in his study, he lost two (2) of those scholarships.

Currently, the researcher is much involved in paving the road map of the rabbit industry in the Philippines. He became a member of the Association of Rabbit Meat Producers in the Philippines (ARaMP), Inc. Also as member of the church, he was part of Jabez Marketing Cooperative. He, along with its members, advocated the raising of rabbits for meat production and sustainable agriculture to be a livelihood not only for the farmers but also for the poor families in the country.

The researcher also conducting seminars in rabbit farming. Due to this background, he came up with the idea to create a research that will help the industry of rabbit in the country to move one step forward. Bounded to his commitment in faith and beliefs as a born again christian, he believed that rabbit farming is a very efficient tool not only as a good source of income; as a way to promote sustainable agriculture; as a way to feed the people; but, most specially as a channel to bring people to Christ.

## ACKNOWLEDGMENT

Appreciation and recognition were hereby conveyed by John Vincent A. Nate to all people who shared their valuable time and benevolent effort, in terms of emotional, financial, and technical support, in the completion of this research work. Wholehearted gratitude to:

Dr. Jeffrey A. Lavarias, Chairperson, Advisory Committee, for his professional guidance and sincere willingness to share his insights and varied research experiences for the enhancement of the study;

Members of the Advisory Committee, Dr. Romeo B. Gavino and Engr. Claire Marie M. Castillo, for their patient supervision and advice for various revisions in this research work;

Dr. Victorino T. Taylan, Dean of the College of Engineering as well as Dr. Ireneo C. Agulto, the researcher's former Dean, for their supervision to the manuscripts of all graduating agricultural and biosystems engineering students;

Dr. Marvin M. Cinense, Chair of the Department of Agricultural and Biosystems Engineering, for keeping his office door open and available for all the times;

PhilDev Foundation for their financial assistance and moral support for the researcher;

Philippine Carabao Center (PCC) for their aid in the laboratory analyses of the pretest and main experiment's biofeeds;

Staffs of Small Ruminant Center (SRC), led by Sir Neil Del Rosario for allowing the researcher to use some of their equipment and also for their assistance in operating the hammer mill including some tips in pelleting feeds;

BSABE 5 students, for sharing some of their time to the researcher as companions in the time of research work ;

the researcher's family, for all their unrelenting support and overwhelming encouragement in the researcher's pursuits; and

above all, the Lord Jesus Christ who is the source of all the knowledge and wisdom that was the essential component in the completion of the study as well as giving guidance and inspiration, all glory is due to Him.

Gratitude was hereby conveyed by Elijohn DC. Natividad to all people who gave their time and effort in the completion of this research work. Thanks was emphasized to:

Dr. Jeffrey A. Lavarias, Chairperson, Advisory Committee, for his outstanding suggestions for the betterment of the research;

Members of the Advisory Committee, Dr. Romeo B. Gavino and Engr. Claire Marie M. Castillo, for their and timely support and effort throughout the entire period of this research as well as the preparation of the manuscript;

DOST (Department of Science and Technology) for their financial assistance for the researcher;

Mr. Arnold and Anthony Neuda, for their hard work and effort on helping for the fabrication of thirty-six (36) rabbit cages that were used on the study as well as their help in the collection of the different ingredients used in the pelleted biofeeds;

Mr. Pedro Dela Cruz and Mr. Simplicio Natividad, for their assistance in the gathering of *napier* grasses which at that time of the study, were not easy to gather due to dry season;

Mr. Giovanne Galayugo, for his initiative in milling the *napier* grasses that took out the burden from the researcher;

Mr. Mark Tolentino and his family, for their hospitality and willingness in hosting the two (2) blocks of the main experiment (i.e., the under the trees and rabbitry blocks). Their assistance were also valuable in giving advices in treating some of the experimental units diagnosed with illness.

Further indebtedness was also emphasized to: Pastor Herson Flores, for his knowledge and hard work in fabricating the retrofitted pelleting machine;

Mr. Teofilo Valdez, for his effort in cutting bamboo trees at Brgy. Culaylay, San Jose City, Nueva Ecija that was used as stand for the rabbit cages;

Mr. James Paul de Jesus, popularly known as Lancaster Hills, for his kindness and special consideration in allowing the researcher to purchase his purebred Californian White (CW) rabbits in installment;

Jabez Marketing Cooperative, for its emotional, moral and financial support for this study to be accomplished, and especially for its open hand for lending the researcher the cages for the preliminary testing and thirty-six (36) feeders;

Pastor George Natividad, who accompanied the researcher wherever they need to go in the course of study. He supported the researcher financially, morally and spiritually, and was the one, who help to reached out every person involved in the study. Without his leadership, this study would not go as smooth as it became.

Special thanks to Ms. Shiena Grace Cariaga, for her unending support, morally, physically and academically. She was the one who shared her knowledge and initiative in the process of linear programming as a mathematics major and accompanied the researcher from the initial day up to the final day of this study.

Recognition was also conveyed to the researcher's family, for their emotional and financial support; and

above all to our Father God in heaven in the name of the Lord Jesus Christ, for His guidance, blessings, everlasting love, strength, and for sending good people to the author's life and bring closer to Him.

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## ABSTRACT

**NATE, JOHN VINCENT A. and NATIVIDAD, ELIJOHN DC.**, Department of Agricultural and Biosystems Engineering, College of Engineering, Science City of Muñoz, Nueva Ecija, Philippines, **June 2019, OPTIMIZATION OF BIOFEED PLAN AND SPACE REQUIREMENT FOR RABBIT (*Oryctolagus cuniculus* L.)**

Adviser: JEFFREY A. LAVARIAS, Ph.D.

Rabbit raising is considered as a potential agricultural venture that can establish an alternative solution for the increasing demand of meat. By taking advantage on rabbit's feeding nature, employing feeds derived from biomass feedstock could reduce rearing expenses. These feeds must be formulated satisfying the rabbits' nutritional needs at minimum cost of production. Moreover, space requirement was another factor that can affect the rabbit's growth performance.

The study aimed to optimize a biofeed plan and space requirement for rabbits. Specifically, it aimed to formulate a pelleted diet by employing mathematical modeling that satisfied the rabbits' nutritional requirements; evaluate the physical characteristics and nutritive values of biofeeds; and evaluate the growth performances of rabbits with varying feed formulations and space requirements.

Treatments were the following: (Factor A) varying space requirements and (Factor B) varying CP and CF feed plans organized in a 3 x 4 Factorial RCBD having three (3) blockings. The thirty-six (36) CWxL rabbits at age of five (5) weeks were divided into three (3) groups randomly that were reared under three (3) different growing conditions (i.e., enclosed air-conditioned room, open rabbitry housing and under the trees' shade). Blocking temperatures was monitored and post-weaning mortality was also recorded.

Results of optimization revealed that the soybean meal and napier hay were served as the main sources of nutrients due to their higher amounts. The biomass feedstock's total prices (₱14.87, ₱15.75 and ₱16.62 per 1 kg biofeed) were minimized while satisfying the required nutrient intervals theoretically.

The nutritive content (i.e., %CP) revealed that there were highly significant differences among the feed plans (average CP:CF ratio with the highest %CP at 26.42%; followed by high CP:CF ratio at 25.52%; and low CP:CF ratio at 22.43%).

In terms of main effects, space requirement (Factor A) had no significant effect in terms of the rabbit's BWGs and FCEs. Conversely, biofeed plan diet (Factor B) had highly significant effect on both parameters. In terms of interaction effects, it was showed a nonsignificant interaction between space requirement (Factor A) and biofeed plan diet (Factor B) for BWGs. Conversely, significant interaction effects was shown for FCEs.

The biofeeds (i.e., average and high CP:CF ratio) were comparable on its efficacy with the commercial feeds in terms of the rabbits' BWG. Moreover, the rabbits in medium and small cages fed with commercial feeds were statistically higher from the other treatment combinations in terms of FCE.

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