CENTRAL LUZON STATE UNIVERSITY

ENUMERATION OF CELLULOLYTIC AND HEMICELLULOLYTIC ANAEROBIC BACTERIAL DISTRIBUTION PRESENT IN THE DIGESTIVE FLUID OF YOUNG WATER BUFFALO
(Bubalus bubalis)

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An Undergraduate Thesis Submitted to the Faculty of the Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines, In Partial Fulfilment of the Requirements for the Degree

BACHELOR OF SCIENCE IN BIOLOGY

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APPROVAL SHEET

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MARIA PAULINE V. AGUINALDO

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ABSTRACT

MARIA PAULINE V. AGUINALDO, Bachelor of Science in Biology, Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Munoz, Nueva Ecija, Philippines, July 2017. **ENUMERATION OF CELLULOLYTIC AND HEMICELLULOLYTIC ANAEROBIC BACTERIAL DISTRIBUTION PRESENT IN THE DIGESTIVE FLUID OF YOUNG WATER BUFFALO *(Bubalus bubalis)***

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This research study was conducted to identify the cellulolytic and hemicellulolytic anaerobic composition of the digestive fluid of calves affected by diet, to analyse chemically the diet fed to the experimental calves, differentiate and compare the cellulolytic and hemicellulolytic anaerobic bacteria microbiota of digestive fluids of calves given different diets, and identify the cellulolytic and hemicellulolytic bacteria by molecular means through conventional PCR. Ten pre-weaned buffalo were divided into two treatments, T1, fed with pure milk, hay or grass forage with additional starter pellet concentrates, T2 fed with milk, hay or grass forage without starter pellet concentrates, Sampling for rumen fluid extraction was done at days 1, 6, 16 and 30. Population count from each treatment were obtained which determine their abundance in the digestive tract fluid. Colostrum, grass and starter feeds fed to the experimental calves were analyzed through proximate analysis. The bacterial colony counts were monitored during the different days of observation and were compared. Isolates were identified through *16S* *r*DNA gene sequences up to genus level. Acquired sequences were cleaned using Codon

Code Aligner then subjected for NCBI Basic Local Alignment Search Tool to confirm the identity of the isolates. Proximate analysis results showed the presence of high fiber concentrations in the diet of ruminants which helped the cellulolytic bacteria to stimulate growth rate. Population Count showed that the number of cellulolytic and hemicellulolytic bacteria from digestive fluid of calves fed with milk hay or grass forage without calf starter pellets was relatively higher compared to the bacterial population in the calves fed with milk hay or grass forage with calf starter pellets. These bacteria were *Bacillus sp.*, *Citrobacter sp.*, *Enterobacter sp.*, *Escherichia sp.*, *Shigella sp.*, and *Staphylococcus sp.*

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