COMPARISON OF THE UTILIZATION OF OIL PALM WASTE FOR BIOETHANOL PRODUCTION

By

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

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To keep up with the demand for a more sustainable and reliable fuel source, Oil Palm waste from crude palm oil production could be used to produce bioethanol as an alternative fuel source. Bioethanol production from Oil Palm solid waste can be made from its juice or lignocellulosic material. The objective of this study is to find the best feed for bioethanol production. The methodology of this research is through the literature methodology by reviewing previous studies about the subject. The result shows that OPF was the most reliable feed for juice methodology and EFB for lignocellulosic methodology. Lignocellulosic methodology was chosen overall to produce bioethanol due to the sheer difference in yield of ethanol compared to juice methodology. The yield of ethanol for OPFS, OPTS, EFBC, OPFC and OPTC are 19.02 g ethanol/Kg OPF, 30.87 g ethanol/Kg OPT, 171.70 g ethanol/Kg EFB, 71.50 ethanol/Kg OPF and 101.82 g ethanol/Kg OPT respectively. Parameters that effect bioethanol production through lignocellulosic methodology are pre-treatment, fermentation method, inoculum, hydrolysis method, pH, temperature, fermentation time and agitation rate. Additional results find that SSF should be used as fermentation method of lignocellulosic EFB, xylitol as by-product of bioethanol production can be used as additional revenue and upscaling a bioethanol plant was achieved through the expansion, replication, and collaboration the process.

Keywords: Oil Palm waste, Oil Palm Frond, Oil Palm Trunk, Empty Fruit Bunch, Bioethanol

DEDICATION

I would like to thank everyone who helped me.

Thank you

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