

MODELLING OF ENZYMATIC HYDROLYSIS OF EMPTY
FRUIT BUNCH FIBER (EFBF) BY ARTIFICIAL NEURAL
NETWORK (ANN) FOR FERMENTABLE
SUGAR PRODUCTION

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ABSTRACT

This research is about to evaluate and make a comparison between the prediction and simulating efficiencies of Response Surface Methodology (RSM) and Artificial Neural Network (ANN) based on models on sugar fermentable by using empty fruit bunch fiber (EFBF) as a feedstock for bioethanol production. In statistics, response surface methodology (RSM) explores the relationships between several explanatory variables and one or more response variables. The parameters were obtained which are enzyme concentration, substrate concentration and time for using and applying in the RSM. The Artificial Neural Network (ANN) model was developed using MATHLAB Neural Network Toolbox to optimize the enzymatic hydrolysis from the 19 sets of experimental data. Based on the result obtained from both models, it indicates that both RSM and ANN models were fitted well to experimental data. However, ANN model showed a slight edge over RSM model due to higher value of R^2 . The R^2 calculated from validation data for RSM and ANN models were 0.9812 and 0.999833 respectively. Thus, it is proven that ANN model is more powerful tool for modeling and optimization of the empty fruit bunch fiber for sugar fermentation production in term of the reducing sugar yield.

TABLE OF CONTENTS

		PAGE
DECLARATION		ii
CERTIFICATION		iii
ABSTRACT		vi
TABLE OF CONTENTS		vii
LIST OF TABLES		ix
LIST OF FIGURES		x
LIST OF ABBREVIATIONS		xi
LIST OF SYMBOLS		xii
CHAPTER 1	INTRODUCTION	
	1.1 Background of Study	1-4
	1.2 Problem Statement	4
	1.3 Objectives of Researches	5
	1.4 Scopes of Researches	5-6
CHAPTER 2	LITERATURE REVIEW	
	2.1 Introduction	7-9
	2.2 The Sources of Palm Oil Biomass	9-12
	2.3 Empty Fruit Bunch Fiber (EFBF)	13-17
	2.4 Ethanol	18-21
	2.5 Pretreatment, Enzymatics Hydrolysis and Lignocellulosic Biomass	21
	2.5.1 Pretreatment	22
	2.5.2 Enzymatics Hydrolysis	22-24
	2.5.3 Lignocellulosic Biomass	24-26
	2.6 Advantages and Disadvantages of Bioethanol	27
	2.7 Introduction of RSM	28-29
	2.8 Introducing of ANN	30-31
	2.9 The Biological Model	32-34
	2.10 Introducing MATHLAB	35

CHAPTER 3	METHODOLOGY	
3.1	ANN and RSM	36-40
CHAPTER 4	RESULT AND DISCUSSION	
4.1	Modeling and Optimization Enzymatic Hydrolysis using RSM	41-47
CHAPTER 5	CONCLUSION AND RECOMMENDATION	
5.1	Conclusion	48-49
5.2	Recommendation	49
REFERENCES		50
APPENDICES		51