UNIVERSITI TEKNOLOGI MARA

COMPARATIVE STUDY ON INDUSTRIAL AIR QUALITY (PALM OIL REFINERY) AND LUNG FUNCTION PERFORMANCE TO RECEPTOR POPULATION IN BANTING, SELANGOR

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**Project paper submitted in partial fulfillment of the requirements
for the degree of
Bachelor in Environmental Health and Safety (Hons.)**

Faculty of Health Sciences

MAY 2011

Declaration by Student

Project entitled "Comparative Study on Industrial Air Quality (Palm Oil Refinery) and Lung Function Performance to Receptor Population in Banting, Selangor" is a presentation of my original research work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Mr. Hashim Bin Ahmad, as Project Supervisor and Ass. Prof. Madya Rodziah Binti Ismail as Co-supervisor. It has been submitted to the Faculty of Health Sciences in partial fulfillment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons.)

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2008302927

871108-23-6458

Date: 25 · 5 · 2011

ACKNOWLEDGEMENT

All praise be to Allah S.W.T. The Al Mighty. The Most Gracious and The Most Merciful.

I am heartily thankful to my project supervisor, Mr Hj Hashim Bin Ahmad and my co-supervisor Prof. Madya Rodziah Binti Ismail for their encouragement, guidance and support from the initial to the final level enabled me to develop an understanding of the subject and complete my research on time.

It is a pleasure to thank those who made this thesis possible especially to my lovely friends Mohd Zamzam Bin Mohd Mokhtar and others for their advice and opinion. I would like to thanks to my family members especially my parents and my sisters, Norain Binti Mohamed. Unfortunately, it is not possible to list all of them in this limited space.

I also would like to show my gratitude to Mr. Shahfie Md Latep, Laboratory Assistant for the cooperation and assisting me to conduct and complete the study. The highest appreciation also given to Kuala Langat Local Authority (KLLA), Sime Darby Jomalina Sdn Bhd and Alami Vegetable Oil Product Sdn Bhd for their cooperation contributing to the successful of my study. I offer my regards and blessings to all of those who had supported me in any respect during the completion of the project.

Lastly, I want to extend my appreciation to everybody who contributed to the completion of this thesis entitle "Comparative Study on Industrial Air Quality(Palm Oil Refienry) and Lung Function Performance to Receptor Population in Banting, Selangor.

Thank you so much to ALL.

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Abstract

Comparative Study on Industrial Air Quality (Palm Oil Refinery) and Lung Function Performance to Receptor Population in Banting, Selangor.

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Background: A palm oil refinery factory located <500 meter from the residential area caused some problems to surrounding residents, especially related to air pollution. Arising of industrial development at Banting area especially focused to palm oil refinery factory contribute to cumulative air pollutants concentration to surrounding environment. The effectiveness of environmental management system (ISO 14001) implementation at factory is important to reduce air pollution problem. Study conducted to measure ambient air quality and health risk arising from the existence potential hazards.

Methods: The level of air pollutants (PM_{10}, SO_2, NO_2 and CO) concentration have been measured using EVM7 (Quest) at seven locations (n = 7), to identify the level of ambient air quality at the area. Lung function test also have been done to 90 respondents (n = 90) using Spirometer (Vitalograph) to identify their lung performance status (FVC, FEV1, FEV1/FVC). Questionnaires were given to the respondents to do surveillance regarding on the air quality and health effects at their area. The relationships between concentrations of air pollutants and lung function performance were analyzed using SPSS for statistical analysis. The acceptable limit of pollutants concentration was based on Recommended Malaysian Ambient Air Quality Guideline.

Results: Result shows the significant difference of the pollutants concentration between the Alami Vegetable Oil and other location ($p < 0.05$). FEV1% were significantly correlated with PM_{10} (p value = 0.048), SO_2 (p value = 0.005) and CO (p value = 0.020). It means that higher concentration of PM_{10}, SO_2 and CO gives effect to lung function performance of the respondents. Results also shows that the significant different of lung function performance between expose and non-expose group. Besides, the reading of the pollutants concentration at study area also shows the violation of the SO_2 to Recommended Malaysian Ambient Air Quality Guideline. The high risk estimated is sulphur dioxide with risk 115% and risk score 262 144.

Conclusion: As a conclusion, it can be concluded that the concentration of SO_2 at Alami Vegetable Oil Product Sdn Bhd and other two receptor area exceed the standards for Recommended Ambient Air Quality Guideline compared to other locations. It is also proved that the emission from the factory cause health risk to the residents surrounding in decreasing of lung function performance for receptor group. Therefore, the implementation of ISO 14001 is important to minimize polluting the environment.

Keywords: Air Pollutants, Lung Function Performance, Palm oil refinery, Residential Area.