

UNIVERSITI TEKNOLOGI MARA

**A STUDY OF CADMIUM AND LEAD LEVEL IN CANNED
SARDINES AND ITS RISK TO HUMAN HEALTH**

NURULHUDA BINTI ALIAS

**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 A Study of Cadmium and Lead Level in Canned Sardines and Its Risk to Human Health 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 Tn. Hj. Hashim bin Ahmad as Project Supervisor and Madam Nadiatul Syima binti Mohd Shahid 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).

Student's Signature:

..........

(Nurulhuda Binti Alias)

2007287982

880522-01-5866

Date:27/05/2011.....

ACKNOWLEDGEMENT

Alhamdulillah. Praise be to God for His help and guidance that I finally able to complete this thesis. First and foremost I offer my sincerest gratitude to my supervisor Tn. Hj. Hashim bin Ahmad and my co-supervisor Madam Nadiatul Syima binti Mohd Shahid who has adviced and guidanced me thoughout my thesis with their patience and knowledge.

I also thank the Environmental Health Department lab staff, Mr. Azwat bin Abdullah, Mr. Mohd Shafie bin Md. Latef and Madam Maziah Mahaad, without whose knowledge and assistance this study would not have been successful. Faculty of Health Sciences has provided the support and equipment.

To my best friends for their encouragement and support especially at times when things were going tough. I cannot end without thanking my family, on whose constant encouragement and love especially my mother, Siti Hawa Binti Sohod and my father, Alias Bin Ahmad Nawi. In hope, this study will benefits to all of us.

TABLE OF CONTENTS

TITLE PAGE	
ACKNOWLEDGEMENT	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF EQUATIONS	viii
LIST OF APPENDICES	ix
LIST OF ABBREVIATIONS	x
ABSTRACT	xi
CHAPTER ONE: INTRODUCTION	
1.1 Background Information	1
1.2 Problem Statement	2
1.3 Study Justification	4
1.4 Study Objectives	5
1.4.1 General Objective	5
1.4.2 Specific Objectives	5
1.5 Study Hypothesis	5
1.6 Conceptual and Operational Definitions	5
1.6.1 Conceptual Definition	5
1.6.2 Operational Definition	5
1.7 Conceptual Framework	6
1.7.1 Cadmium	6
1.7.2 Lead	7
CHAPTER TWO: LITERATURE RIVIEW	
2.1 Properties of Cadmium and Lead	8
2.2 Use of Cadmium and Lead	9
2.3 Toxicity of Cadmium and Lead	9
2.4 Cadmium and Lead Occurrence in Canned Fish	12
2.5 Legal Requirement	13

Abstract

A STUDY OF CADMIUM AND LEAD LEVEL IN CANNED SARDINES AND ITS RISK TO HUMAN HEALTH

Nurulhuda Binti Alias

There is an increasing concern about the quality of foods in several part of world. A study was conducted to identify level of cadmium and lead in canned sardines, to compare level of cadmium and lead between three brands of canned sardines and to identify association between cadmium and lead exposure in canned sardines and health risk. Cadmium and lead in canned sardines was determined using graphite furnace atomic absorption spectrophotometer (AAS). A cross sectional study was done to compare level of cadmium and lead between three brands of canned sardines and health risk. Modified Food Frequency Questionnaires were distributed to respondents participated (n=100) to assess dietary intake of canned sardines. Cadmium concentration obtained from canned sardines sample ranged from 0.001 to 0.628 mg/kg while lead concentration obtained from canned sardines sample ranged from 0.884 to 3.552 mg/kg. Level of cadmium in canned sardines were found below the permitted level while level of lead in canned sardines were found high in canned sardines. Health risk is significantly associated with cadmium and lead exposure in canned sardines. Most of the canned sardines had higher content of lead than the permitted level. All the canned sardines had cadmium concentration below the permitted level. Exposure assessment of lead is below the tolerable daily intake. There was low risk with respect to the concentrations of cadmium in canned sardines.

Keywords: *Cadmium, Lead, Canned Sardines, Graphite Furnace Atomic Absorption Spectrophotometer, Modified Food Frequency Questionnaires*