

HEAVY METAL IN EDIBLE SEAWEEDS COMMERCIALIZED
FOR HUMAN CONSUMPTION

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HEAVY METAL IN EDIBLE SEAWEEDS COMMERCIALIZED

FOR HUMAN CONSUMPTION

By

Tan Seok Kuan

Research Report submitted in partial fulfillment of

the requirement for the degree of

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**DEPARTMENT OF MARINE SCIENCE
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU**

DECLARATION AND VERIFICATION FORM

FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled:

Heavy Metal in Edible Seaweeds Commercialized for Human Consumption

by **Tan Seok Kuan**, Matric No. **UK 17471** has been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the Degree of **Bachelor of Science (Marine Science)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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LIST OF ABBREVIATIONS

%	percentage
°C	degree Celsius
g	gram
kg	kilogram
mL	milliliter
μg	micrometer
HNO ₃	nitric acid
H ₂ O ₂	hydrogen peroxide
NO ₂	nitrogen dioxide
Cu	copper
Fe	iron
Zn	zinc
Pb	lead
Cd	cadmium
wt	weight
AAS	atomic absorption spectrometry

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ABSTRACT

This research aimed at provides information on the concentrations of several harmful heavy metals present in commercialized seaweeds samples and compare with the Malaysian Food Act 1983 (act 281) & Regulations. Comparison of concentration heavy metals in different brands of commercial seaweed were performed and focus on analyzing the concentration of heavy metals (Cu, Fe, Zn, Pb, Cd) in the algae based products for direct consume edible seaweed found at the market of Malaysia by using AAS (atomic absorption spectrometry). A total 18 samples were obtained from different brands which are brands Feng Xia, Shun Tai, Ren He Trading , Sumo (a), Sabah Wet Market (a), Sabah Wet Market (b), Xing Lang, Sumo (b), Jia Sheng, New Sun, Giant, Bei Shan Wan, Triple-M, D & C, Shan Zhi Zhen, Fei Yan Pai, AAA and Shuang Deng Pai throughout Malaysia *Undaria* (wakame), *Porphyra* (Nori), *Laminaria* (Kombu) and *Kappaphycus alarezii* (*Eucheuma cottonii*) were purchased for this research. It is concluded that 22.2% of the brands of seaweed exceeded the limits set for Cadmium and Lead. Brand Feng Xia and Sabah Wet Market (a) were the seaweed brands which all of the heavy metals content are within the permissible level of Malaysians Food Act 1983. The other sixteen brand of edible seaweed are exceeded at least one type of heavy metals content. Brand Feng Xia and Sabah Wet Market (a) brand of edible seaweed not contaminated by heavy metals.

ABSTRAK

Kajian ini bertujuan untuk menyediakan maklumat mengenai kepekatan logamberat yang berbahaya yang hadir dalam beberapa sampel rumput laut yang dikomersialkan. Selain itu, perbandingan antara kandungan kepekatan logamberat dalam rumput laut dengan Akta Makanan Malaysia 1983 telah dijalankan. Kandungan kepekatan logamberat dalam rumput laut dari jenama yang berbeza juga disbandingkan. Kajian ini memberi tumpuan kepada menganalisis kepekatan logamberat (Cu, Fe, Zn, Pb, Cd) dalam produk alga yang didapati di pasaran Malaysia dengan menggunakan AAS (Spektrometri Penyerapan Atom). Sebanyak 18 sampel yang diperolehi daripada jenama yang berbeza iaitu jenama Feng Xia, Shun Tai, Ren He Trading, Sumo(a), Wet Market Sabah (a), Wet Market (b), Xing Lang, Sumo (b), Jia Sheng, New Sun, Giant, Bei Shan Wan, Triple-M, D&C, Shan Zhi Zhen, Fei Yan Pai, AAA dan Shuang Deng Pai. Undaria (Wakame), Porphyra (Nori), Laminaria (Kombu) dan Kappaphycus alvarezii (Eucheuma cottonii) telah dibelikan untuk kajian ini. Dapat dirumuskan bahawa 22.2% jenama rumput laut telah melebihi had cadmium dan plumbum yang ditetapkan dalam Akta Makanan Malaysia. Jenama Feng Xia dan Sabah Wet Market (a) adalah jenama rumput laut yang kandungan logamberatnya (Cu, Fe, Zn, Pb, Cd) tidak melebihi paras had. 16 rumput laut yang daripada jenama yang lain melebihi sekurang-kurangnya satu jenis logam kandungan berat. Jenama Feng Xia dan Sabah Wet Market (a) merupakan jenama rumput laut selamat dimakan berbanding dengan rumput laut jenama lain dalam kajian ini.