

HEAVY METALS IN SEAFOOD FROM PASAR PAYANG

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SCHOOL OF MARITIME STUDIES AND MARINE SCIENCE  
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# **HEAVY METALS IN SEAFOOD FROM PASAR PAYANG**

**By**

**Chiew Choy Wan**

**Research Report submitted in partial fulfillment of  
the requirement for the degree of  
Bachelor of Science (Marine Science)**

**Department of Marine Science**

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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 Metals in Seafood From Pasar Payang by Chiew Choy Wan, Matric No. UK 20668** 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 SYMBOLS / ABBREVIATIONS

$\mu\text{g/g}$	Micro gram per gram
AAS	Atomic Absorption Spectrophotometer
ANOVA	Analysis of variance
Cd	Cadmium
Cu	Copper
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organization
Fe	Iron
GESAMP	Group of Experts on the Scientific Aspects of Marine Pollution
Mn	Manganese
Pb	Lead
RBC	Risk-based concentration
WHO	World Health Organization
Zn	Zinc

## ABSTRACT

This study was to investigate the contamination of heavy metals in commercially important seafood. The aim of this study is to provide information on the Cd, Cu, Fe, Pb, Mn and Zn levels in the muscle, and fish gill for seven samples (*Megalaspis cordyla*, *Nemipterus furcosus*, *Rastrelliger kanagurta*, *Decapterus macrosoma*, *Curangoides caeruleopinnatus*, *Lutjanus lineolatus*, *Atule mate* ), and compare the heavy metals contain in these two tissues. Heavy metals concentration in squids (*Loligo spp*) and prawns (*Penaeus merguensis*, *Penaeus semisulcatus*) also determine in this study. The seafood samples collected from Pasar Payang. All seafood samples have Cd, Cu, Pb, and Zn in the range of 0.09 – 2.97 µg/g, 1.15 – 9.67 µg/g, 0.03 – 3.07 µg/g, and 16.86 – 55.18 µg/g respectively. These heavy metals ranged were below the maximum allowable level provided by FAO (2007). Whereas there are no recommended maximum level from FAO for Fe and Mn, the range for Fe were 10.03 – 475.83 µg/g, and for Mn were 0.70 – 14.90 µg/g form this studied. This studied also showed that gills accumulated higher heavy metals concentration compare to fish muscles.

# LOGAM BERAT DALAM MAKANAN LAUT YANG DIPEROLEHI DARIPADA PASAR PAYANG

## ABSTRAK

Kajian ini dijalankan untuk mengkaji pencemaran logam berat dalam makanan laut yang diperolehi dari Pasar Payang. Matlamat kajian ini adalah menyediakan maklumat tentang kepekatan logam Cd, Cu, Fe, Pb, Mn dan Zn dalam otot ikan dan insang ikan bagi tujuh spesies ikan (*Megalaspis cordyla*, *Nemipterus furcosus*, *Rastrelliger kanagurta*, *Decapterus macrosoma*, *Curangoides caeruleopinnatus*, *Lutjanus lineolatus*, *Atule mate*), dan bandingkan kepekatan logam berat dalam otot dan insang. Selain itu, kepekatan logam berat terdapat dalam sotong (*Loligo spp*) dan udang (*Penaeus merguensis*, *Penaeus semisulcatus*) juga ditentukan. Semua sampel terdapat Cd, Cu, Pb dan Zn dalam julat 0.09 – 2.97 µg/g, 1.15 – 9.67 µg/g, 0.03 – 3.07 µg/g dan 16.86 – 55.18 µg/g masing-masing. Julat logam berat adalah rendah daripada tahap maksimum daripada FAO (2007). Walaubagaimanapun, tiada tahap maksimum untuk Fe dan Mn untuk rujukan daripada FAO. Julat untuk Fe adalah 10.03 – 475.83 µg/g, dan 0.70 – 14.90 µg/g untuk Mn. Kajian ini juga membuktikan insang ikan mengumpulkan lebih tinggi kepekatan logam berat banding dengan otot ikan.