

ANALYSIS OF PERFORMANCE LEVEL IN THE STUDY OF  
MULTI-MEDIA METHOD IN THE DETERMINATION OF  
TECHNOLOGY-BASED TYPES OF TECHNOLOGY

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Comparison of performance between the standard and modified method in the determination of mercury in fish chips of Terengganu.



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COMPARISON OF PERFORMANCE BETWEEN THE STANDARD AND  
MODIFIED METHOD IN THE DETERMINATION OF MERCURY IN FISH  
CHIPS OF TERENGGANU

By

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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

**Comparison of Performance between the Standard and Modified Method in the  
Determination of Mercury in Fish Chips of Terengganu**

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## LIST OF ABBREVIATIONS

ACS	American Chemistry Society
BOD	Biological Oxygen Demand
CNN	Central News Network
CRM	Certified Reference Materials
CV-AAS	cold vapor- Atomic Absorption Spectrometry
DOH	Departmental Of Health
DOLT -2	Dogfish liver
DNA	Deoxyribonucleic Acid
EEC	European Emission Council
EPA	Environmental Protection Agency
FAO	Food and Drugs Administration
FDA	Food and Drugs Administration
GI	Gastro Intestinal
HNO <sub>3</sub>	Nitric Acid
KMnO <sub>4</sub>	Potassium Permanganate
NaCl	Sodium Chloride
NAS	National Academy of Science
NHANES	National Health and Nutrition Examination Survey
NO	Nitrogen Oxide
RSD	Relative Standard Deviation
RNA	Ribonucleic Acid

<b>SD</b>	<b>Standard Deviation</b>
<b>SnCl</b>	<b>Stannous Chloride</b>
<b>TOC</b>	<b>Total Organic Carbon</b>
<b>WHO</b>	<b>World Health Organization</b>

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## ABSTRACT

The study was conducted to evaluate the modified method and standard method for the determination of mercury in “keropok keping” and “keropok lekor”. The samples were analyzed by using Cold Vapor -Atomic Absorption Spectrometry (CV-AAS). Several parameters were evaluated for both methods such as linearity, precision, accuracy and detection limit. The certified reference material used was DOLT-2 (DogFish Liver).The parameter shows better precision and accuracy for the modified method than standard method in the determination of mercury content in keropok lekor. By minimizing the sample for digestion and without the usage of potassium persulfate for the modified method, the results show better recovery than the standard method. Gas flow has significant effect to the absorbance and optimized at  $47 \text{ ml min}^{-1}$ . Variation of gas flow influences the detection of mercury in CV-AAS. The highest mercury concentration in “keropok lekor” was  $162 \pm 1 \text{ ng/g}$  and “keropok keping” was  $113.2 \pm 0.24 \text{ ng/g}$ .

# PERBANDINGAN KAEDAH PIAWAIAN DAN KAEDAH UBAHSUAI PIAWAIAN DALAM PENENTUAN MERKURI DI DALAM KEROPOK IKAN DI TERENGGANU

## ABSTRAK

Kajian telah dijalankan bagi penentuan merkuri di dalam keropok lekor dan keropok keping melalui dua kaedah iaitu kaedah ubahsuai piawaian dengan kaedah piawaian. Sampel telah dianalisa dengan menggunakan teknik wap sejukan-Spektrometri Penyerapan Atom (CV-AAS). Pelbagai parameter telah dikaji seperti ujian kelinearan, ketepatan, kejitian dan had penentuan. Bahan rujukan piawaian yang digunakan dalam kajian ialah DOLT-2 (DogFish Liver). Kajian parameter mendapati kaedah ubahsuaian piawaian menunjukkan kejitian dan ketepatan yang lebih tinggi bagi bacaan kepekatan merkuri dalam sampel berbanding kaedah piawaian asal. Dengan meminimalkan sampel dan tanpa penggunaan kalium persulfat dalam kaedah piawaian didapati sampel menunjukkan secara signifikan nilai tidak berbeza dari nilai rujukan piawaian. Pengaliran gas mempunyai kesan terhadap tahap penentuan merkuri. Aliran gas dioptimalkan pada  $47 \text{ ml min}^{-1}$ . Tahap merkuri tertinggi dalam sampel keropok lekor ialah  $162 \pm 1 \text{ ng/g}$  dan bagi keropok keping ialah  $113.2 \pm 0.24 \text{ ng/g}$ .