11th Asean Food Conference 2009

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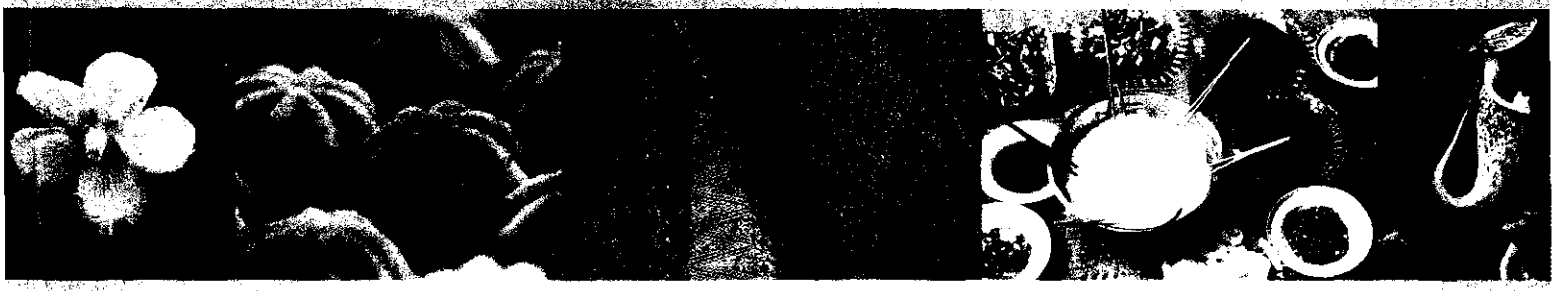
Prof. Madya Shariza Abdul Razak
Pusat Pengajian Sains Kesihatan



11TH ASEAN FOOD CONFERENCE 2009

FOOD SCIENCE AND TECHNOLOGY: INNOVATIVE APPROACHES AND OPPORTUNITIES FOR GLOBAL MARKET

AN ACTIVITY OF ASEAN COMMITTEE ON SCIENCE AND TECHNOLOGY & FEDERATION OF INSTITUTES OF FOOD SCIENCE AND TECHNOLOGY IN ASEAN

OCTOBER 21-23, 2009

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overall shift to significantly ($p<0.05$) lower melting temperatures compared to control for 70:30 blend om 42.7oC to 35.6oC), 50:50 blend (45.5oC to 39.9oC) and 30:70 blend (46.3oC to 42.8oC) after 24h nsesterification reaction.

ywords: M.oleifera seed oil; palm stearin; transesterification; TAG composition; thermal behavior

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2/P31

Determination of Heavy Metal Content (Cd, As) in Fish Widely Consumed in East Coast of Peninsular Malaysia

Shariza, A.R. [1*], Norfadzila J., Kasmah Wati, P. Jesmine, K, and Sakinah, H.

outh China Sea is an important source of marine fishes used as food to the population in the East Coast of eninsular Malaysia (Kelantan, Terengganu and Pahang). Recent fast pace of development contributed to the ollution to the marine ecosystem as well as marine fishes in this area. In this study, heavy metals (Cd and As) ere analysed in the popular and widely consumed fish (Selar boops, Rastrellinger branchysoma, Decapterus aruadsi and Sardinella sirm) by Atomic Absorption Spectrometry (AAS). The average metal concentration f Cd ranging from 0.05- 6.93 mg/kg and highest concentration was found in the fish bones and lowest in ie muscle. Concentration of As is the range of 0.01-0.07 mg/kg and distributed evenly in muscle, bones nd internal organ (livers). From this study, it might indicate that the fishes are still safe for consumption but aution must be adhered in order to reduce pollution in this sea.

eywords: Heavy metals; Cd; As; East Coast of Peninsular Malaysia, Atomic Absorption Spectrometry

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2/P32

Proximate analysis and mineral determination of spray dried Pitaya powder (Hylocereus polyrhizus)

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taya are now being established as a small exotic fruits that becoming more well-known of the health otentials that contains in it. It has grown a lot of attention in producing products from pitaya fruit by the od processing industry. This study was conducted to determine the proximate analysis and certain minerals ontent in spray dried red pitaya fruit powder (Hylocereus polyrhizus). Proximate analysis of spray dried red taya powder showed a composition of 10.9% moisture, 1.22 g ash, 1.59 g protein, 26.6 g carbohydrate, 007 g fat, 12.05 g insoluble dietary fiber and 5.65 g soluble dietary fiber. The mineral content in spray dried d pitaya powder was potassium (227.8 mg), sodium (22.77 mg), magnesium (13.93 mg), iron (1.09 mg), zinc .73 mg), selenium (0.69 mg) and copper (0.14 mg). The results showed that the nutrients that contains in is spray dried red pitaya powder could give potential benefits for human health.

eywords: proximate analysis, minerals, spray-dried, red pitaya, powder.

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Determination of Heavy Metal Content (Cd, As) in Fish Widely Consumed in East Coast of Peninsular Malaysia

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Abstract

South China Sea is an important source of marine fishes used as food to the population in the East Coast of Peninsular Malaysia (Kelantan, Terengganu and Pahang). Recent fast pace of development contributed to the pollution to the marine ecosystem as well as marine fishes in this area. In this study, heavy metals (Cd and As) were analysed in the popular and widely consumed fish (*Selar boops, Rastrellinger branchysoma, Decapterus maruadsi and Sardinella sirm*) by Atomic Absorption Spectrometry (AAS). The average metal concentration of Cd ranging from 0.05-6.93 mg/kg and highest concentration was found in the organ and lowest in the muscle. Concentration of As is in the range of 0.01-0.07 mg/kg and distributed evenly in muscle, bones and internal organ (livers). From this study, it might indicate that the fishes are still safe for consumption but caution must be adhered in order to reduce pollution in this sea.

Keywords: Heavy metals; Cd; As; East Coast of Peninsular Malaysia, Atomic Absorption Spectrometry

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Introduction

Industrial development is growing rapidly throughout the world especially in the developing countries such as Malaysia. With all the industrial advancement in Malaysia, pollutants and wastes such as heavy metals are channeled into the surroundings especially marine ecosystem (Burridge et al., 1999). Malaysian living in the East Coast of Peninsular Malaysia depend on fishes as one of the protein supply. In this case, it is important to monitor and examine the level of toxic metals since these pollutants will be accumulated in the fishes consumed by this community.

Heavy metals are known as not biodegradable and have the potential to be accumulated in the different parts of fish which may lead to the various side effects (Sathawara et al., 2004). Cadmium (Cd) and Arsenic (As) are known to be toxic and excessive content of these metals in food is associated with numerous diseases. Cd is associated with cardiovascular, nervous and kidney diseases (Jarup, 2003) while As will results in loss of appetite, gastrointestinal disturbances, skin melanosis and also suspected carcinogen.

The aim of this study is to analyzed the distribution and concentration of both heavy metals in fishes (*Selar boops, Rastrellinger branchysoma, Decapterus maruadsi and Sardinella sirm*) which are widely consumed in the East Coast of Peninsular Malaysia. The results from the study will be used as a pollution indicator and accumulations in fishes in this aquatic environment.

Materials and Methods

Sample Collection

A total of 4 samples of widely consumed marine fishes, *Selar boops*, *Decapterus maruadsi*, *Rastrelliger branchysoma*, *and Sardinella sirm* were obtained from markets of East Coast of Peninsular Malaysia which are Pasar Besar Siti Khadijah, Kota Bharu, Kelantan, Pasar Payang, Kuala Terengganu, Terengganu and Pasar Besar Kuantan, Kuantan, Pahang. Each sample was weighed, measured, cleaned with deionized water, labeled with species name, location, and date and kept in the box containing ice for preservation until further process. All samples from every location were analyzed in triplicate for 2 elements of studied heavy metals.

Sample Decomposition and Analytical Measurement

Dry ashing was used in this experiment to decompose the samples. This method was applied in order to determine the content of ash in the foods or samples. This method involves the heating of samples in Muffle furnace with the presence of air at 400-800°C to extract the organic materials. After extraction, analyses of the heavy metals were done by Graphite Atomic Absorption Spectrophotometer (GAAS) technique.

Statistical Analysis

The data obtained were analysed by using Duncan's Multiple Range Test and Two-Way Analysis of Variance (ANOVA) for the determination of significant different ($p<0.05$) for the level of pollution between samples and the yielded mean values by using Statistical Analysis System (SAS) software.

Results

Table 1: Average Cadmium and Arsenic (in bracket) Concentration in Samples Collected from Kelantan, Terengganu and Pahang, Malaysia.

Species	Average Heavy Metal Content (mg/L dry weight)		
	Kelantan	Terengganu	Pahang
Muscle (Edible portion)			
1. *Selar boops*	0.057±0.01 (0.020±0.01)	0.047±0.05 (0.031±0.05)	0.050±0.02 (0.022±0.02)
2.*Rastrelliger branchysoma*	0.090±0.03 (0.014±0.03)	0.107±0.01 (0.042±0.01)	0.080±0.05 (0.069±0.05)
3.*Decapterus maruadsi*	0.090±0.04 (0.041±0.04)	0.110±0.02 (0.051±0.02)	0.087±0.01 (0.040±0.01)
4. *Sardinella sirm*	0.080±0.02 (0.030±0.02)	0.087±0.02 (0.040±0.02)	0.337±0.01 (0.040±0.01)
Bones			
1. *Selar boops*	3.920 ±0.02 (0.009 ±0.01)	4.057±0.15 (0.014±0.05)	4.813±0.12 (0.019±0.02)
2.*Rastrelliger branchysoma*	2.047±0.23 (0.009±0.03)	2.050±0.12 (0.018±0.01)	2.660±0.15 (0.014±0.05)
3.*Decapterus maruadsi*	2.880-±0.04 (0.023±0.04)	3.010±0.12 (0.014±0.02)	3.847±0.02 (0.013±0.01)
4. *Sardinella sirm*	3.173 ±0.02 (0.011 ±0.02)	3.033±0.12 (0.021±0.02)	3.847±0.12 (0.022±0.01)
Organ (liver)			
1. *Selar boops*	1.247 ±0.22 (0.024 ±0.0.01)	1.497±0.02 (0.021±0.01)	1.637±0.12 (0.038±0.02)
2.*Rastrelliger branchysoma*	2.333±0.23 (0.031± 0.03)	1.227±0.12 (0.021±0.01)	6.927±0.15 (0.024±0.05)
3. *Decapterus maruadsi*	2.003±0.04 (0.035±0.04)	2.407±0.02 (0.028±0.02)	0.613±0.05 (0.068±0.05)
4. *Sardinella sirm*	1.020±0.02 (0.029±0.02)	0.693±0.02 (0.019±0.02)	0.613±0.05 (0.043±0.01)

Discussion

The average metal concentration of Cd ranging from 0.05-6.93 mg/kg and highest concentration was found in the organ and lowest in the muscle. Concentration of As is in the range of 0.01-0.07 mg/kg and distributed evenly in muscle, bones and organ (livers).

Conclusion

In conclusion, the results from this study indicated that the fishes are still safe for consumption but caution must be adhered in order to reduce pollution in coastal water in the East Coast of Peninsular Malaysia.

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