



## Director Message

Assalamualaikum w.b.t

*"O ye people! Eat of what is on earth, Halalan Thoyyiba; and do not follow the footsteps of the evil ones, for he is you to an avowed enemy."*

(Surah Al-Baqarah – 168)

*"The Prophet SAW mentioned [the case of] a man who, having journeyed far, is disheveled and dusty and who spreads out his hands to the sky [saying]: O Lord! O Lord! – while his food is haram, his drink is haram, his clothing is haram, and he is nourished with haram food, so how can he be answered"*  
(Muslim).

Compliance to the Shariah law and the need for good quality products are the fundamental requirements in the concept of 'Halalan Thoyyiba'. Verses in the Quran and Hadiths such as the above have repeatedly highlighted this need.

With the demand of halal products increasing globally and the increased complexity of determining the source, there are increasing concerns on the product authenticity and quality among the Muslim consumers. Some manufacturers are unclear of what constitute halal, knowingly or through pure ignorance use the halal logo on their products. This has lead to confusion, outrage and even to some extent blaming the authorities for their lack of control and monitoring among Muslim consumers at the state of affairs.

Thus, there is a need currently to educate everyone on halal and haram matters as there are many issues on Muslim's consumer products. Since the halal and haram are viewed seriously in Islam, it is imperative that Muslims lead the way into research and develop new methods and techniques in verifying the authenticity of halal products. It also provides the opportunity for a Muslim to fulfill his/her obligations towards the Ummah. This is one of the reasons for the establishment of Halal Products Research Institute (HPRI) in Universiti Putra Malaysia (UPM).

A critical mass of halal scientists are required to conduct research and development on halal products and services to address this global Muslim basic need. More tertiary and research institutions like UPM should embark on halal products research programs as only through research we can educate ourselves and provide services to others. We hope that the establishment of these centres and the role they play in society will increase the confidence in the halal products and services that are consumed. For Muslim scientists and ulama, this is an area that we can contribute to ensure that the sanctity of halal is upheld. This is basically the vision of Halal Products Research Institute - **"Upholding the Sanctity of Halal Through Research and Services"**.

Wassalam

**Prof. Dr. Yaakob Che Man**  
Director

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# Editor's Note

Last June, the Halal Products Research Institute (HPRI) has marked its three years of its existence. During that period, the institute has made a lot of achievements and at the same time, needs to conduct more efforts to uphold the sanctity of Islam, particularly in Halal related issues through research and development.

HPRI is aware of the need to continuously develop new methods and products as well as policies to safeguard the Muslims from fraud and contamination for their life's daily requirements. These are foods, pharmaceuticals, nutraceuticals, cosmetics, healthcare, apparel and businesses including both financial and banking. Thus, the three laboratories established under the Institute namely Laboratory of Analysis and Authentication, Laboratory of Products and Process Innovation and Laboratory of Policy and Management are actively pursuing research and development programs to ensure that the Muslims get what they rightly deserved.

This important task that the Institute shoulders are strongly supported by the University and other government agencies like the Department of Islamic Development (JAKIM), Economic Planning Unit (EPU), Department of Standard (DSM) and Halal Industry Development Corporation (HDC).

## Editorial

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Siti Munira Abd Razak

Nur Fadhilah Khairil Mokhtar

Syariena Arshad

### TECHNICAL :

Mohd Salehan Sanusi

The establishment of the Halal Analysis Laboratory to confirm the authenticity of halal products which would be in operational by soonest early next year will definitely be the most awaited activity from the public.



ASSOC. PROF. DR. SHUHAIMI MUSTAFA  
Deputy Director



# Researcher's Profile

## **ASSOC. PROF. DR. AMIN ISMAIL**

Head of Authentication & Analysis Laboratory

Dr. Amin started his career as a tutor in July 2000 at the Department of Nutrition and Dietetics (formerly known as Department of Nutrition and Health Sciences), Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. Later, he was appointed as a lecturer at the department in December 2000. In 2004, Dr. Amin was promoted to senior lecturer and Associate Professor in May 2006 at the same department. He was the Head of Food Quality Laboratory, Centre of Strategic Studies and Food Innovation, UPM from 2005 till 2006. He is currently the Head for Laboratory of Analysis and Authentication, Halal Research Products Institute, Universiti Putra Malaysia.

Dr. Amin is at present one of expert panels/stakeholders for UNEP/GEF PDF-B Funded Project, and involved in "FAO International Expert Consultation on Indicator Development for Nutrition and Biodiversity". He is also member in several main committees at the Ministry of Health Malaysia. Besides that, he represented Nutrition Society of Malaysia as a Malaysian representative in several international workshops/seminars/conferences organized by CODEX. He was an Assistant Honorary Secretary of Nutrition Society of Malaysia (2001 – 2006), and Council Member for Society of Free Radical Research Malaysia.

Dr. Amin's research areas focus on the health benefits of antioxidant polyphenols from Malaysian cocoa products, utilization of food processing by-products, and antioxidant and nutritional analysis. He was awarded several grants from the Ministry of Science, Technology and Innovation (MOSTI), Ministry of Higher Education and UPM for projects related to antioxidants and polyphenol of fruits and cocoa, and utilization of food processing by-products for functional foods. He is currently collaborating with Malaysia Cocoa Board (MCB), Forestry Research Institute of Malaysia (FRIM) and Malaysian Agricultural Research, Development Institute (MARDI) and Golden Hope Fruits and Beverages Industry Sdn. Bhd. to study the above research areas.



He was involved in an international grant awarded by International Atomic Energy Agency (IAEA). In consultation field, he was a project leader for a contract research between UPM and Kotra Pharma (M) Sdn. Bhd. Currently, he is heading a research contract with State Government of Sarawak on antioxidants work. Through his research, he was awarded a Young Scholar Award in 2005, and has received a Fellowship award from the United Nation University in 2001. His perseverance and hard work have gained several recognition both locally and abroad.

To date, Dr. Amin has more than 60 articles in peer-reviewed citation journals; book chapters, proceedings and research/consultancy reports. He has 3 patents pending. At international level, he is one of three Editorial Board members from South East Asia for "Food Chemistry" an International ISI Journal published by Elsevier. He was appointed as an external examiner for MS and PhD thesis adjudication from local and abroad universities.

## SAMAK – A Najs Ritual Cleansing

Najs are things that are impure and not permissible. There are three types of najs; mughallazah, mutawassitah and mukhaffafah, which are severe, medium and light najs respectively. Example of the mukhaffafah najs include is urine from a baby boy at the age of 2 years and below whom has not consumed any other food except his mother's milk. While vomit, pus, blood, alcoholic drinks (khamar), carrion, liquid and objects discharged from the orifices are the examples of mutawassitah najs. Mughallazah which is considered as severe najs includes dogs, pigs (khinzir) or any liquid and objects discharged from their orifices, descendants and derivatives.

The Islamic religion states clearly how to clean these najs. First, cleaning the mukhaffafah najs can be done by removing the najs and sprinkling the stained area with water thoroughly. Then to clean mutawassitah najs, the najs must be removed and washed thoroughly by letting water run through the stained area to get rid of color, smell and taste of the najs. Three sessions of water soaking are recommended. Finally the mughallazah najs can only be cleansed through dibagh or washing method and ritual cleansing according to Shariah law. For reference, this cleaning procedure is stated in Malaysian Standard MS 1500:2004.

### Method of washing and ritual cleansing (dibagh) according to Shariah law for mughallazah najs

#### General requirements

The najs, whether visible ('ainiah) or invisible (disappeared or dried up etc.) is named hukmiah. To clean najs:

- It is required to wash seven times, one of which shall be water mixed with soil
- The first wash shall be to clear the existence of najs, even if a few washes are needed. The water from first cleaning shall not remain behind and the next wash shall be counted as the second wash; and
- The amount of soil used is just enough to make a suspension

#### Conditions of the soil

The conditions of the soil are:

- Free from najs
- Free from other impurities like oil
- Not musta'mal soil [which had been used for dry ablution (tayammum)] except after subject to heavy rain

#### Conditions of the water

The conditions of the water are:

- Natural (mutlaq)
- Not musta'mal (NOTE: musta'mal water is the water that is less than 2 qollah; approximately 270 L, that had been used for cleansing) and
- Free from najs



Nowadays, the cleaning procedures are getting easy since the clay soap had been developed. The National Fatwa Council had approved the use of clay soap for cleansing mughallazah najs but with the requirement that the clay must be pure and the percentage of the clay must exceed other ingredients and the procedures of cleaning are according to syariah law.



# Staff's Profile



**Siti Munira Abdul Razak**  
Science Officer

**Siti Munira Binti Abdul Razak** was born in August 13, 1980 in Tampin, Negeri Sembilan. She received her secondary education in Sekolah Menengah Datuk Undang Abdul Manap, Negeri Sembilan and later completed her Diploma from Universiti Teknologi Mara (UiTM). She continued her undergraduate education at the Faculty of Food Science & Technology, Universiti Putra Malaysia (UPM) and graduated in 2004 with Bachelor of Food Science and Technology. She Started her career as an Officer of Food Technology (contract) at the Public Health Laboratory in Johor Bahru under the Food Packaging Units in 2004 and exposed to various equipments such as Fourtier Transform Infra-Red (FT-IR) to identified the specific components of an unknown packaging material, High Performance Liquid Chromatography (HPLC) to determine the Bisphenol A, Phenol, p-t Butylphenol and Diphenylcarbonate in food packages and Gas Chromatography (GC) to determine the Acrylonitrile and Volatile Substances in food materials. Currently, she serves as Science Officer at the Laboratory of Product and Process Innovation, IPPH since August 1, 2006. She was responsible for handling various instruments and laboratory equipment. In addition, she also assists in research activities and general administration of IPPH

## Halal Forensic Laboratory Training Course

The Halal Forensic Laboratory Training Course for IMT-GT, ASEAN and OIC Scientist was held on 28th September to 2nd October 2009. This training was organized by The Halal Science Center (HSC), Chulalongkorn University. Thirteen ASEAN scientists from seven countries namely, Indonesia, Malaysia, Brunei, Bangladesh, Philippines, Singapore and Turkey participated in this programme. Halal Product Research Institute sent two staffs, Syariena Arshad and Nor Nadiha Mohd Zaki to participate in this training course. The programme compose of a series of lectures focusing on the theories from specialists, as well as practical training. For the practical training, the scientists were trained by HSC staffs to conduct laboratory works on fatty acids, alcohol, gelatin and DNA.



## Activities

	Date	Activities	Location
JUN	2 - 5	Malaysian Society of Animal Production of 30th Annual Conference	Kota Kinabalu, Sabah
	8 - 9	Strategic package for Higher growth : promoting new sources of growth	Holiday Inn Genmarie, Shah Alam
	10 - 11	Developing meaningful strategic performance management system-balance scorecard methodology	Concorde Hotel , Shah Alam
JULY	2	Quality Management Systems (MS ISO 1900-12005) - Requirement from Islamic Perspectives	Hotel Avillion Legacy
	8 - 9	Pengurusan Standard Halal Malaysia workshop	ILIM, Bangi
	10	Awareness SPK Pengajian Siswazah	IPPH, UPM
	21 - 23	Peraturan dan Keselamatan Makmal Kimia	UPM
	22 - 23	QMS1 & QMS2 Sistem Pengurusan Kualiti	IPPH, UPM
	27	Proper LC Column Cace & Advancements in LC Column Technology	IPPH, UPM
AUGUST	31	Halal Packaging	IPPH, UPM
	2 - 4	The 6th meeting on the ASEAN Working Group on Halal Food	Brunei
	11 - 12	Mini Symposium on Halal Products Analysis and Innovation	PWTC, Kuala Lumpur
NOV	13	Oxford Said Business School, University Oxford, UK	University Oxford, UK
	20 - 22	Halatuju & Pelan Tindakan Strategik Penyelidikan & Siswazah	Port Dickson
DEC	21 - 22	3 <sup>th</sup> IMT-GT International Symposium on Halal Science and Management 2009	Pan Pacific, KLIA



# IPPH Activities in 2009

## Visitors



- ① Dewan Perwakilan Rakyat Republik Indonesia 4/8/2009
- ② Group from OIC Country 4/8/2009
- ③ Group from JAKIM 28/9/2009



- ④ Kolej Melaka 29/7/2009
- ⑤ Delegation from Pakistan 3/11/2009



①



- ① Halal Business in France Seminar @ IPPH, 14/8/2009
- ② Pengurusan Harta dalam Islam Seminar @ Economic Faculty, UPM 19/5/2009
- ③ 10th Asian Conference on Analytical Sciences @ PWTC Kuala Lumpur 11-13/8/2009
- ④ Halatuju & Pelan Tindakan Strategik Penyelidikan & Siswazah workshop, @ Port Dickson, 20 - 22 /11/2009
- ⑤ Universitas Gadjah Mada, Indonesia 19 /10/2009



③



④



⑤

## Seminar / Workshop



# Achievements

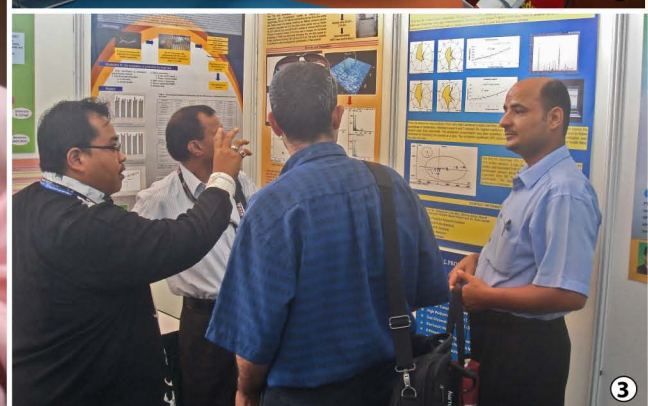


- ① Prof. Dr. Yaakob received the Halal Scientist Award at the World Halal Research Summit 2009
- ② Assoc. Prof. Dr. Shuhaimi Mustafa with Eureka Awards, 2008
- ③ Prof. Dr. Jamilah Bakar with her Medal for Halal Collagen from Freshwater Fish Skins. Geneva , 2009

- ④ National Intellectual Property Awards, 2009 (NIPA'09)
- ⑤ Malaysia Technology Exhibition Awards, 2009
- ⑥ Malaysian Halal Excellence Awards, 2009 (Best Halal Research Centre)

# Exhibitions

- ① MTE 2009 @ PWTC , Kuala Lumpur **19-21 /2/2009**
- ② MIHAS Exhibition @ MATRADE **7-10 /5/2009**
- ③ Postgraduate Fair 2009 @ Engineering Faculty **12/3/2009**

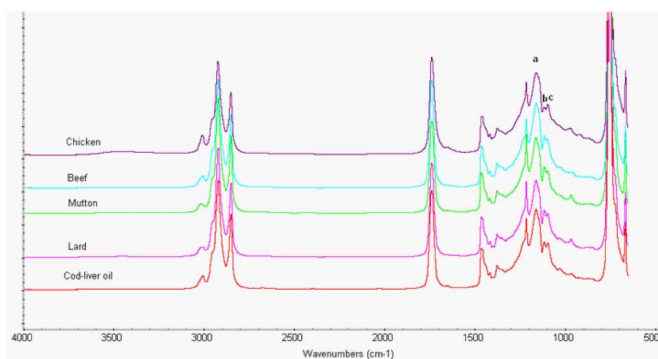




## MONITORING THE PRESENCE OF LARD IN COD LIVER OIL USING FOURIER TRANSFORM INFRARED (FTIR) SPECTROSCOPY

Non halal material such as lard can be added to high value oils such as cod-liver oil (CLO) in order to gain economical profits. This study highlighted the application of Fourier transform infrared (FTIR) spectroscopy as a non destructive and fast technique for the determination of adulterants in cod-liver oil.

FTIR spectra of cod-liver oil and animal fats (chicken, mutton, beef, and lard) look very similar (Figure) because CLO and animal fats composed from fatty triglyceride esters. However, a detailed investigations in the fingerprint region, especially in the wavenumber range of  $1500 - 1000 \text{ cm}^{-1}$ , revealed that there are visual differences for absorption peaks at  $1162 \text{ cm}^{-1}$  (a) and two adjacent peaks at  $1117$  (b), and  $1097 \text{ cm}^{-1}$  (c). The peak at  $1162 \text{ cm}^{-1}$  was attributed to C-O stretching and CH<sub>2</sub>-bending, whereas peaks at  $1117$  and  $1097 \text{ cm}^{-1}$  are assigned to -C-O stretching. Multivariate calibration of partial least square can be developed for quantitative measurement of the lard in the region range region  $1035 - 1030 \text{ cm}^{-1}$ . A good relationship between actual value of lard (x) and FTIR predicted value was obtained with a coefficient of determination (R<sup>2</sup>) higher than 0.99 and root mean standard error of cross validation (RMSECV) of 1.04 ( $y = 0.944x - 0.605$ ). For classification between CLO and that added with lard, discriminant analysis using 7 principal components was able to classify the samples as pure CLO or CLO adulterated with lard based on their FTIR spectra at the selected fingerprint regions ( $1500 - 1030 \text{ cm}^{-1}$ ).



FTIR spectra of Cod-liver oil, lard, mutton, beef, and chicken fats at region of  $4000 - 650 \text{ cm}^{-1}$

Keywords: Adulteration, cod-liver oil, lard, PLS, Discriminant analysis, FTIR.

### Source of the article.

Rohman and Che Man, Y.B. (2009). Analysis of cod-liver oil adulteration using Fourier Transform Infrared (FTIR) spectroscopy, *Journal of The American Oil Chemist Society*: 86: 1149-1153



Abdul Rohman is currently a Ph.D student in Halal Products Research Institute, UPM, under supervision of Prof. Dr. Yaakob B. Che Man with scholarship from The National Education Ministry, Republic of Indonesia. The main research interest is on the application of FTIR spectroscopy for analysis, authentication, and monitoring oxidative stabilities of edible fats and oils.



## DETERMINATION OF GELATIN SOURCES USING FOURIER TRANSFORM INFRARED (FTIR) SPECTROSCOPY

Gelatin is derived from the skin, white connective tissue and bones of animals. It is widely used as gelling agent, foaming agent, stabilizing agent and water binder in confectionary (sweets and chocolate), ice-cream, dairy goods and meat products. However, the applications of gelatin in food become an issue for Muslims and people of the Jewish faith. In this study, a simple method was developed using Fourier Transform Infrared (FTIR) spectroscopy in combination with attenuated total reflectance (ATR) and discriminant analysis have been developed in order to classify unknown gelatin into their species of origin. Figure 1 showed the similarity of bovine and porcine gelatins spectra, which is very difficult to be differentiated directly with the naked eyes. Thus, principal component analysis was used to classify and characterize gelatin components by using the regions of  $3290\text{--}3280\text{ cm}^{-1}$  and  $1660\text{--}1200\text{ cm}^{-1}$  as calibration model. The results from Cooman's plot (Figure 2) clearly explained the potential of FTIR in distinguishing the source of gelatins. FTIR spectroscopy is proven to be a potential method in discriminating bovine and porcine gelatins to alleviate consumers' anxiety.

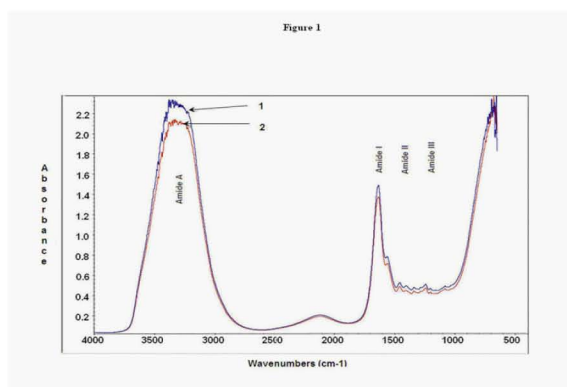


Figure 1. FTIR spectra for bovine gelatin (1) and porcine gelatin.

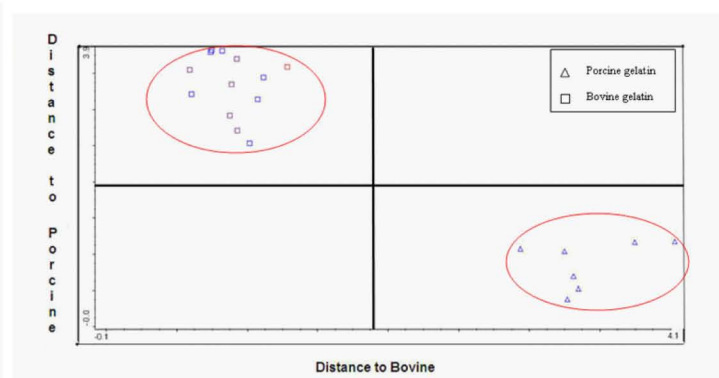


Figure 2. Mahalanobis distance plot for two classes of gelatin: porcine gelatin and bovine gelatin.

### Source of the article:

Hashim, D. M., Che Man, Y. B., Norakasha, R., Shuhaimi, M., Salmah, Y., & Syahariza, Z. A. (2010). Potential use of Fourier transform infrared spectroscopy for differentiation of bovine and porcine gelatins. *Food Chemistry*, 118 (3), 856-860.



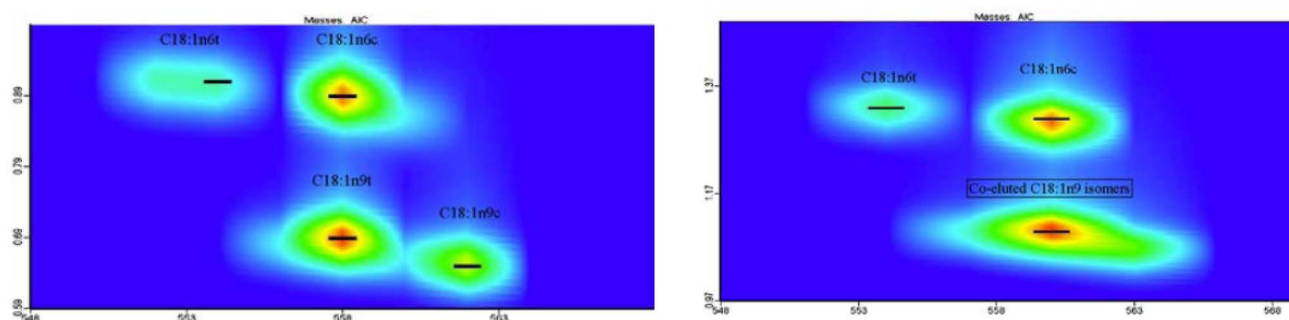
Norakasha Rusli is currently doing her Master of Science degree in Halal Products Research Institute under the supervision of En Dzulkifly Mat Hashim. Her specialization of study is Fourier Transform Infrared (FTIR) spectroscopy and High Performance Liquid Chromatography (HPLC).



# PUBLICATION

## RAPID PROFILING OF ANIMAL-DERIVED FATTY ACID USING FAST GC X GC COUPLED TO TIME-OF-FLIGHT MASS SPECTROMETRY.

Rapid profiling of fatty acid methyl esters (FAME) from five different animal sources was examined in this study using fast comprehensive two-dimensional gas chromatography coupled to time-of-flight mass spectrometry (fast GC x GC-TOFMS). The result showed that gc x GC analysis two different microbore columns allowed three fold faster analysis times than those observed for conventional GC x GC analysis. The modulation ratio (MR) of the system was defined at the value of 2.38 by optimizing the modulation period and offset temperature for precise mass spectral identification and highest effluent resolution in the analysis. In accordance with the normalized FAME level obtained from various animal fats, namely lard (LA), chicken fat (CF), beef tallow (BF), mutton tallow (MF) and cod liver oil (CLO), a clear discrimination of LA from the other species by principal components analysis (PCA) was observed. This was attributed to several FAME constituents involving methyl 6,9,12,15-heneicosatetraenoate (C21:4n-6), methyl 11,14-eicosadienoate (C20:2n-6), Cis-9,12-methyl octadecadienoate (C18:2n-6C), Cis-methyl octadecenoate (C18:1n-9C) and methyl hexadecanoate (C16:0).



**Fig. 2** Separation of C18 cluster in GC x GC contour plot acquired with modulation period of 2-s (left figure) and 3-s (right figure), respectively.

Source of article:

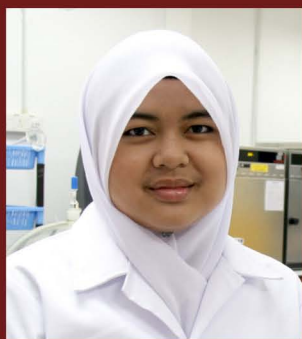
Chin, S.T., Che Man, Y.B., Tan, C.P. and Hashim, D.M. Rapid profiling of animal-derived fatty acids using fast GC x GC coupled to time-of-flight mass spectrometry. *J. Am. Oil Chem. Soc.*, 86, 949-958 (2009).



Chin Sung Tong was the Research Assistance (February 2008 until February 2009) in Halal Products Research Institute under the supervision of Prof. Dr. Yaakob Che Man. His specialization of study is Development and Application of Multi Rapid Analytical Techniques.



# Student's Profile



**Nurul Hayati Abdul Hamid** was born in August, 1985 in Jelebu, Negeri Sembilan. She received her secondary education at Sekolah Menengah Kebangsaan Sultan Abdul Aziz Shah, Kajang, Selangor. She then attended Matriculation College in Malacca and subsequently went to the Universiti Putra Malaysia where she received a Bachelor's Degree in Food Science and Technology from the Faculty of Food Science and Technology. Now she is pursuing her Master's Degree in Halal Food Analysis. Her current research focusing on the alcoholic compounds in selected fermented foods. She hopes to gain additional knowledge in the field she has chosen. She also wishes that Halal Products Research Institute will achieved its mission and vision and contributing to the country and community. Well, the sky is the limit!



**Umi Hartina Mohd Razali** was born and raised in Jelebu, Negeri Sembilan. She is the third from six siblings. Finished her high school in 2002 at Tunku Kurshiah College, Seremban, Negeri Sembilan. She then graduated from the Faculty of Biotechnology and Biomolecular Sciences, University Putra Malaysia with Bachelor Degree in Science (Biotechnology) in 2007. Currently, she is pursuing her Masters of Science (Halal Food Analysis) at Halal Products and Research Institute and since then she has gained a lot of knowledge and experience from her study. The main area in her research that she is focusing in is protein extraction and characterization. She hopes with her knowledge and skills in the food analysis area can help to contribute towards a better development of the halal products in Malaysia and to the world.



**Wan Siti Farizan** was born in 1985 in Tumpat, Kelantan. She started her early education at secondary school named Sek. Men. Keb. (Agama) Naim Lilbanat, Kota Bharu, Kelantan before continuing her one year pre-university study at Kolej Matrikulasi Melaka, session of 2003/2004. She obtained her Bachelor Degree of Science with Honour in Food Biotechnology from Universiti Sains Islam Malaysia (USIM), Nilai, Negeri Sembilan. Currently, she is continuing her master study at Halal Product Research Institute (HPRI), UPM, Serdang, Selangor since January 2009. Her research interest is on the application of Fourier transform infrared (FTIR) spectroscopy for the detection of lard in pastry products. She is determined to complete her study with flying colours and contribute significant knowledge in halal products development in Malaysia.



**Ilyia Nur Ab Rahman** was born on 8th April 1985 in Klang, Selangor and received her secondary education at Mara Junior Science College Kuantan, Pahang. She completed her Matriculation Course from Perak Matriculation College and continued her undergraduate studies at the Faculty of Food Science & Technology, University Putra Malaysia in Bachelor of Food Science & Technology. Currently, she is pursuing her studies at IPPH in Master of Science (Halal Food Management). Her research objectives are to investigate the factors, studies the extent of the factors influencing the non compliance of Halal standard among the restaurant operators and developing the profiles of the non-compliance of Halal standard restaurant operators with various types of restaurants such as Mamak restaurant, fast food, fine dining restaurant and food court. She hopes that this institute will be the gateway to explore new dimensions and chart new findings in Halal research for the benefit of ummah.





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# ORGANIZATION CHART

## Halal Products Research Institute Universiti Putra Malaysia

